Designing high-density neighbourhoods to promote social health in Australia

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Abstract

Australian urban environments are changing, as increasing numbers of people are moving into high-density dwellings. At the same time solo living is the fastest growing household type in the country. Given the relationship between social isolation, loneliness and health, this literature review aimed to investigate how high- density neighbourhoods can be designed to promote social health in Australia. Using a systematic approach, ten databases were searched for peer-reviewed research, published between 2008-2018, resulting in eleven articles that met the inclusion criteria. The articles were appraised using four evidence-based tools, and the findings suggested four major themes that relate to social health and the design of high-density neighbourhoods; 'urban form', 'public facilities', 'third places' and 'green space'. Analysis of three national sets of guidelines relating to cities and urban planning revealed an overall absence of consideration of these four design elements in relation to social health. This review therefore recommends that social health considerations be embedded into current national planning policies and guidelines to assist in the development of more socially inclusive, new high-density neighbourhoods in Australia.

Key words: design, high-density, social health, connectedness, neighbour, urban.

Introduction

Urbanisation is one of the most important population trends ever documented, with almost all population growth over the next 30 years predicted to be in urban areas (United Nations Human Settlements Programme [UNHSP] & World Health Organization [WHO], 2010). It is also expected that by the year 2050, 70% of the world's population will be living in cities (WHO, 2010). The way cities are planned and designed are recognised as having an important effect on both individual and community well-being (Corburn, 2015; Leyden, Goldberg, & Duval, 2011). It has long been acknowledged that the relationship between the built environment and health is strong, and rather complex (Giles-Corti, Ryan, & Foster, 2012). Although recent evidence confirms that high-density living offers positive physical health benefits, the impacts of the built environment on social health (e.g. social connectedness, social cohesion, sense of

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community and social inclusion) are not as well understood, and are the focus of this review (Raman, 2010; Cho & Lee, 2011; Ghahramanpouri, Lamit, & Sedaghatnia, 2013).

Australia is one of the most urbanised countries in the world, with around 90% of people living in urban areas, and their population continually growing (Giles-Corti et al., 2012). In order to accommodate this growing urban population, apartment living has increased by 78% over the past 25 years (Australian Bureau of Statistics [ABS], 2016). High-rise dwellings have become a popular housing choice in cities due to closer proximity to work/study opportunities, reduced travel time, and a growth in inner city services (Dong & Qin, 2017; Qiu, Cao, & Xu, 2016). Solo living is also the fastest growing household type in the country, predicted to increase 63% over the next 25 years (ABS, 2016; Department of Sustainability and Environment [DSE], 2004).

High-density urban environments offer many health and environmental benefits such as access to better health care, greater economic opportunities and reduced car emissions (Raman, 2010). The majority of evidence to date, has focused on the impact of the built environment on physical health, with a large body of research demonstrating that compact cities can encourage physical activity through more walking, cycling and public transport use (Kent, Thompson, & Jalaludin, 2011; Raman, 2010; Kelly, 2012).

High-density environments can, however, be detrimental to health if not designed appropriately (Raman, 2010). Concerns have been raised in regard to the social health and well-being of high-density urban communities (Cho & Lee, 2011; Ghahramanpouri et al., 2013). The ways in which social health can be supported in a high-density built environment has received limited research though, two previous reviews suggest that mixed-use design (e.g. including non-residential amenities and functions) can encourage social connections, by providing places for people to meet (Kelly, 2012), and green spaces can foster increased social contact (Kent et al., 2011). A limitation of this work however, is that these reviews did not focus specifically on research in high-density urban areas (Kelly, 2012; Kent et al., 2011).

Given the move to higher-density living in Australia and the recognised link between social isolation and poor health, built environments that are planned to encourage social connections and reduce isolation are important considerations in helping Australians live healthier lives (Tam, 2017; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). This review thus aims to provide evidence on how high-density neighbourhoods can be designed to promote social inclusion. The specific research questions addressed by this review are:

1. Can urban form promote social health?
2. What aspects of high-density environments promote social health?

This review then goes on to discuss how findings align with current national guidelines and frameworks on cities and urban planning.

Methods

Current national and international literature was reviewed using a systematic approach. A variety of databases were searched through EBSCOHost, and 5 key search terms were used. Details of the specific databases and variations of search terms are outlined in Table 1.

Table 1. Research questions, relevant search terms and results

Search Term	Database	Results
(design* OR planning OR "urban design*" OR façade* OR "architectural feature*" OR "spatial design*" OR "soft feature*" OR construction*) AND ("high density" OR "residential complex*" OR hous* OR "high rise*" OR apartment* OR "housing complex*" OR "tall build*" OR "tower block*" OR "vertical cit*" OR flat* OR "healthy hous*" OR reside* OR dwelling* OR "multi stor*") AND ("social health" OR "social environment*" OR "social* connect*" OR "social* inclus*" OR belong* OR "sense of community" OR "social relationship*" OR "social* cohes*" OR "social support*" OR "socially sustain*" OR "residential social cohesion" OR "social capital") AND (neighbour* OR neighbor* OR communit*) AND (urban OR "inner city" OR city OR cities)	Academic Search Complete	761
	Art & Architecture Source	113
	Avery Index to Architectural Periodicals	23
	CINAHL Complete	117
	Global Health	120
	Health Policy Reference Center	123
	MEDLINE Complete	337
	PsycINFO	289
	SocINDEX with Full Text	250
	Urban Studies	235
A further 13 articles identified from reference lists, and 4 from background reading		

Inclusion and Exclusion Criteria

Literature was screened and selected according to the following inclusion/exclusion criteria:
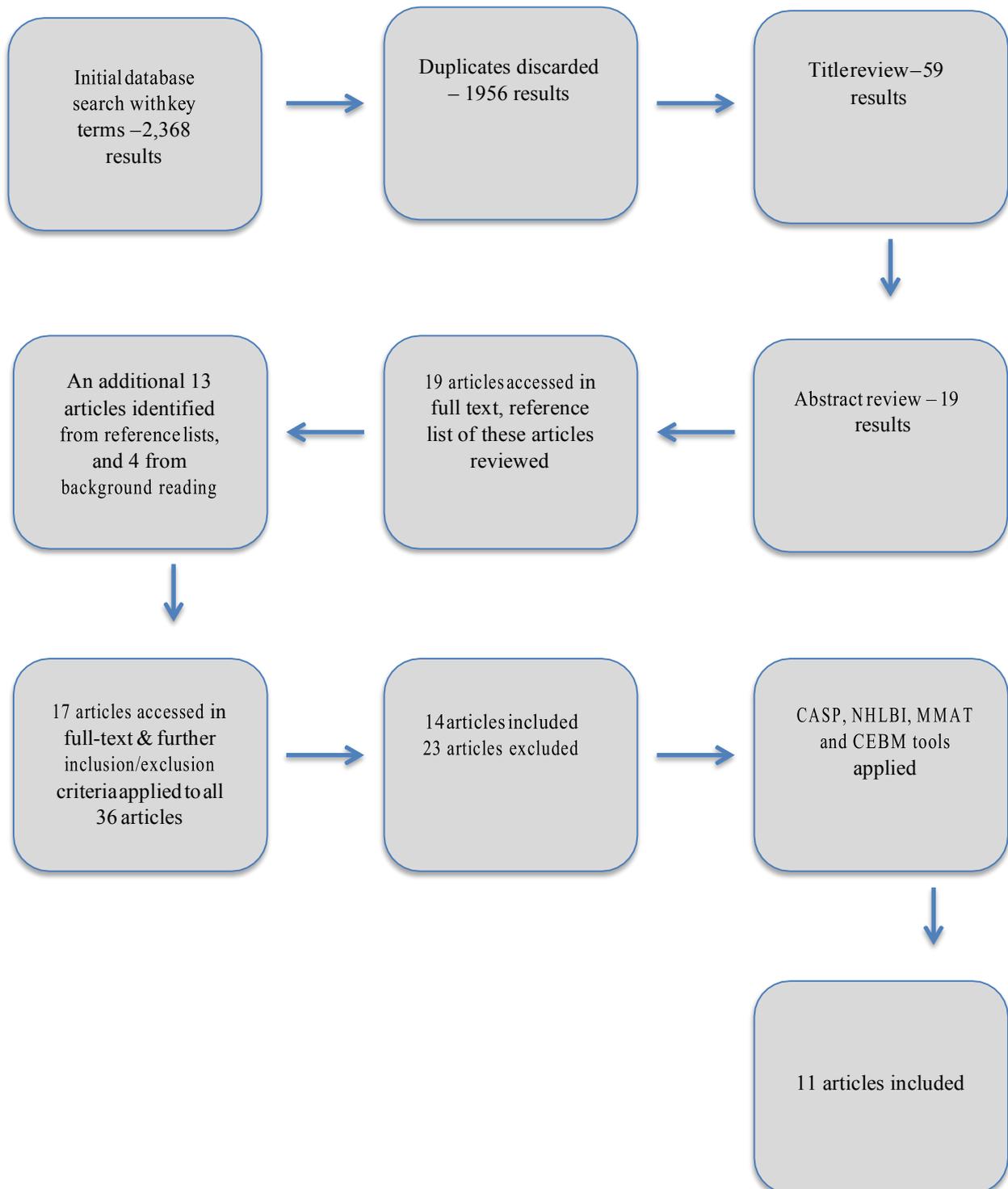
Inclusion Criteria:

- Published between 2008-2018
- English language publications
- Scholarly (peer-reviewed) journals
- Primary research

Exclusion Criteria:

- Research conducted in developing countries
- Secondary research and reviews
- Research conducted in low-density, suburban neighbourhoods

The initial search using the key search terms identified in Table 1 yielded 2,368 results. Once all duplicates were discarded, a title and abstract review were performed and exclusion criteria applied. Following the abstract review, a total of 19 articles were deemed potentially relevant and their reference lists were also reviewed. An additional 13 articles were identified as potentially relevant from the reference lists, as well as 4 articles from prior background reading. These 17 articles were accessed in full-text for further evaluation. Once the 36 articles were accessed in full-text, further assessment was performed against the above exclusion criteria, as a result 14 were deemed appropriate for inclusion in the next stage of the review process. After completing the critical appraisal process, 11 articles were considered relevant and of a high quality and were used in the review (see Figure 1).

Figure 1. Flowchart of Literature Search Method

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┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ Initial database│      │ Duplicates      │      │ Title review – 59│
│ search with key │ ───► │ discarded       │ ───► │ results         │
│ terms – 2,368   │      │ – 1956 results  │      │                 │
│ results         │      │                 │      │                 │
└─────────────────┘      └─────────────────┘      └─────────────────┘
                                                           │
                                                           ▼
┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ An additional 13│      │ 19 articles     │      │ Abstract review │
│ articles        │      │ accessed in     │      │ – 19 results    │
│ identified from │ ◄─── │ full text,      │ ◄─── │                 │
│ reference lists,│      │ reference list  │      │                 │
│ and 4 from      │      │ of these        │      │                 │
│ background      │      │ articles        │      │                 │
│ reading         │      │ reviewed        │      │                 │
└─────────────────┘      └─────────────────┘      └─────────────────┘
        │
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┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│ 17 articles     │      │ 14 articles     │      │ CASP, NHLBI,    │
│ accessed in     │      │ included        │      │ MMAT and CEBM   │
│ full-text &     │ ───► │ 23 articles     │ ───► │ tools applied   │
│ further         │      │ excluded        │      │                 │
│ inclusion/      │      │                 │      │                 │
│ exclusion       │      │                 │      │                 │
│ criteria applied│      │                 │      │                 │
│ to all 36       │      │                 │      │                 │
│ articles        │      │                 │      │                 │
└─────────────────┘      └─────────────────┘      └─────────────────┘
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                                                  │ 11 articles     │
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Critical Appraisal

The critical appraisal process involved assessing the articles for quality. As the 14 articles consisted of a variety of study designs, a range of appropriate assessment tools were identified. To examine the quality of the qualitative studies, the Critical Appraisal Skills Program (CASP) tool was used the assess the articles (CASP, 2017). The National Heart, Lung and Blood Institute Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NHLBI) was selected to critically appraise the quantitative articles (NHLBI, 2016). The Mixed Methods Appraisal Tool (MMAT) was used to appraise the mixed methods article (Pluye et al., 2011). The Critical Appraisal of a Case-Study Tool by the Centre for Evidence-Based Management (CEBM) was used to examine the case-study article (CEBM, 2014). Further details of critical appraisal tools and scores are displayed in Table 2.

Table 2. Critical Appraisal Results

Critical Appraisal Skills Programme (CASP) Qualitative Checklist											
Article	1	2	3	4	5	6	7	8	9	10	Score
Cattell et al., 2008	Y	Y	Y	Y	Y	C/T	C/T	Y	Y	Y	8
Williams & Pocock, 2010	Y	Y	Y	Y	Y	C/T	C/T	Y	Y	Y	8

[1]

Centre for Evidence Based Management (CEBM) – Critical Appraisal of a Case-Study											
Article	1	2	3	4	5	6	7	8	9	10	Score
Raman, 2010	Y	Y	Y	Y	Y	Y	C/T	Y	Y	Y	9

[2]

National Heart, Lung & Blood Institute (NHLBI) Quality Assessment Tool														
Article	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Score
Cabrera & Najarian, 2015	Y	Y	N	Y	Y	N	N	N/A	Y	N/A	Y	N/A	N/A	Y	7
Francis et al., 2012	Y	Y	Y	Y	N	N	N	N/A	N	N/A	Y	N/A	N/A	Y	7
Jeffres et al., 2009	Y	Y	N	Y	Y	N	N	Y	N	N/A	Y	N/A	N/A	Y	7
Maas et al., 2009	Y	Y	Y	Y	Y	N	N	Y	N	N/A	Y	N/A	N/A	Y	8
Prochorskaite et al., 2016	Y	Y	N	Y	Y	N	N	Y	N	N/A	Y	N/A	N/A	Y	7

[3]

MMAT Appraisal Tool for Mixed Methods														
Article	General Screening		Qualitative				Quantitative (non-randomized)				Mixed Methods			
	1	2	1.1	1.2	1.3	1.4	3.1	3.2	3.3	3.4	5.1	5.2	5.3	Score
Chile, Black., & Neill, 2014	Y	Y	Y	Y	Y	Y	Y	Y	Y	C/T	Y	Y	N	11
Dempsey, 2009	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	N	10
Mouratidis, 2018	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	11

[4]

Answer Key	
Y	Yes
N	No
C/T	Can't Tell
N/A	Not Applicable

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[1] For full details of questions, please see CASP, 2017.
[2] For full details of questions, please see CEBM, 2014.
[3] For full details of questions, please see NHLBI, 2016
[4] For full details of questions, please see Pluye et al. 2011

After completing the critical appraisal process, a thematic analysis was then undertaken, where the findings from all 11 papers were summarised and grouped (Nowell, Norris, White, & Moules, 2017). This process of grouping similar findings was repeated and refined until there was a clear emergence of four key themes: Urban form, public facilities, third places, and green space. An Internet search was also undertaken to identify national frameworks and guidelines relating to cities, planning and health.

Results

There are eleven studies included in the results section of this review. These studies were published between 2009 and 2018, as this timeframe coincides with the recent increase in high-density living. They also focus on developed countries, as this was deemed more relevant to the Australian context. Please refer to Table 3 for a summary of all articles in the review.

The four themes that related to social health and the built environment in high-density neighbourhoods: Urban form; Public facilities; Third places and Green space are discussed below.

Urban form

There were two main areas covered in relation to urban form in the literature; density and mixed-use design. Density refers to a measurement that is often used by planners and developers to calculate people or buildings in a specific space per unit area (Raman, 2010). Two studies looked specifically at the relationship between density and social relationships and interestingly found conflicting results.

Mouratidis (2018) found compactness and high-density to have a positive statistically significant effect on the frequency of socialising, opportunities to meet new people, and the number of close relationships compared with those residing in low-density neighbourhoods. This finding was further highlighted in interviews in this study, with for example an interviewee responding 'I'm more social there [in compact area] than I was before [in low-density suburban area]' (Mouratidis, 2018, p. 14).

In contrast, Raman's (2010) research showed that people in higher-density neighbourhoods felt they knew fewer people, concluding that perceptions of social networks (both numbers and strength) were reduced in higher-density neighbourhoods. Although this study used multiple indicators to measure social networks and triangulation of data, a smaller number of sites were studied compared with Mouratidis' (2018) research, which may be one reason for the differences in findings. Furthermore, aside from potential cultural differences between the studies, participants in Mouratidis' research were slightly older and more educated than the general population, therefore may have had more opportunities for social support than those in Raman's study.

Mixed land use was also identified as having an influence on social health in this review, but again with conflicting findings. Mixed land use is a planning technique that encourages mixed-use amenities and functions (e.g. non-residential dwellings such as shops) within a neighbourhood (Cabrera & Najarian, 2015).

Dempsey (2009) found that mixed-use development within the neighbourhoods examined, did not have a strong association with social cohesion. Conversely, Mouratidis (2018) showed mixed-land use development facilitated overall social wellbeing. Findings indicated there may be more opportunities for social interaction in dense, mixed-land use areas, due to increased local facilities, and closer proximity to amenities (Mouratidis, 2018). In support of this, Cabrera and Najarian (2015) reported that residents who used the local shops and

facilities more, had more spatial bridging ties.

Public facilities

There was stronger evidence for the provision of public facilities in high-density areas, playing a role in the social health of residents. Francis, Giles-Corti, Wood and Knuiman (2012) found public open space, shops, community centres and schools, were cited as the most common places for social interaction. High quality public facilities were important for enhancing sense of community, regardless of whether they were frequently used or not. The quality of public facilities also had a more important association with sense of community, than public space number and size (Francis et al., 2012).

Similarly, social interaction was shown to be positively influenced by the quality of the range of public facilities within the neighbourhood such as facilities for children, and sports and recreational facilities (Raman, 2010). Dempsey's (2009) study also supported Francis et al. (2012) and Raman's (2010) conclusions, finding that sense of community and place attachment increased, as perceived attractiveness of the built environment and perceived neighbourhood quality increased. Additionally, there was a positive association between the extent to which residents socialised with neighbours and perceived neighbourhood character (Dempsey, 2009).

Public areas also had to feel safe in order to support social health. Chile, Black and Neill (2014) found that over 50% of participants in their study did not spend any time with their neighbours. This low level of interaction was due to the fact that most respondents felt unsafe around their apartment buildings, streets and public open spaces, during day and night (Chile et al., 2014). As a result many participants reported feeling socially isolated (Chile et al., 2014).

Interestingly, despite these findings, Prochorskaite, Maliene, Couch and Malys (2016) reported that residents did not rank 'neighbourhood design that contributes to safety from crime' very highly, compared with other aspects of urban design in their online survey. However, residents were only surveyed from a small geographical area in this study.

Third Places

Third places are public spaces outside the home or workplace, in which informal, voluntary and unorganised social interaction can occur (Williams & Pocock, 2010) and were also strongly linked to social health in this review.

Cattell, Dines, Gesler and Curtis (2008) found that third places that encouraged people to get together, were crucial to a general sense of well being, and had a positive influence on sense of community. Similarly in Mouratidis' (2018) study, third places were positively associated with social life, as they offered locations for local residents to meet and participate in leisure activities. Participants in both studies stated third places could positively influence their social life because they were spaces in which friendships could be maintained, and spontaneous meetings of new acquaintances could occur (Cattell et al., 2008; Mouratidis, 2018). Francis et al. (2012) study also reported chance encounters between neighbours at third places increased a sense of community.

There were several types of third places cited by participants for social interactions that were mentioned consistently in this review. Coffee shops and restaurants were the most popular third places cited by 13% of Jeffres, Bracken, Jian and Casey's (2009) sample. Markets were also frequently cited third places where respondents went and met with people (Jeffres et al., 2009; Cattell et al., 2008; Francis et al., 2012). One woman reported that the market provided a comfortable and enjoyable environment in which she would find herself talking with strangers she wouldn't normally speak with (Cattell et al., 2008). A positive association between the presence of shops and markets and sense of community was noted, as frequent use of these third places helped strengthen social relationships, which improved local sense of

community (Cattell et al., 2008; Francis et al., 2012). It was also concluded that third places need to be lively, and perceived as an enjoyable place to be, with some participants claiming the 'atmosphere' of a store as more important than the foods available (Francis et al., 2012). Places where people felt comfortable to go alone, was a major prerequisite for settings in which meeting people could take place (Cattell et al., 2008).

An unexpected finding was that 29% of respondents in Jeffres et al. (2009) study stated they were unable to think of somewhere to go within their community, even though researchers used follow-up probes. Reporting no third places within the community was negatively correlated with quality of life (Jeffres et al., 2009). It was interesting to note that it was residents living in central city neighbourhoods most likely to report there were no third places (Jeffres et al., 2009). Furthermore, social interactions did not always have to take place for people to gain social health benefits, for many people, just knowing they had access to third places improved their quality of life and sense of community (Jeffres et al., 2009; Cattell et al., 2008).

The location of third places was also important in supporting social health. Raman (2010), Dempsey (2009) and Williams and Pocock (2010) all found third places that were visible, centrally located, and easy to access increased the number of social interactions. Social spaces that connected pedestrian routes had a constant presence of people, and therefore the highest number of social interactions (Raman, 2010). Centralised third places also increased feelings of belonging and sense of community (Raman, 2010; Williams & Pocock, 2010).

Green space

Four studies highlighted the relationship between green space and social health in high-density neighbourhoods. Maas, Van Dillen, Verheij and Groenewegen (2009) found that green space not only offered an informal space for meeting people, but those with more green space within a 1km radius had experienced fewer health complaints in the last two weeks and had better perceived health. A significant relationship was also noted between feelings of loneliness and percentage of green space within a 1 and 3km radius of people's homes (Maas et al., 2009).

Similarly, Francis et al. (2012) and Cattell et al.'s (2008) studies found parks to be one of the places respondents reported having many unexpected meetings with people. Those who lived less than 5mins from a park reported a stronger sense of community than those who lived between 5-15mins away (Francis et al., 2012). It was suggested that those who live closer to green space, use it for multiple purposes involving social exchanges such as walking the dog or as a cut-through route, meaning increased encounters within the neighbourhood (Cattell et al., 2008; Francis et al., 2012).

Access to green space was particularly significant for vulnerable residents. Maas et al. (2009) reported that having less access to green space was linked with a perceived lack of social support, especially for children, the elderly, and those from a lower socio-economic status (SES). The authors suggested that it is less important for those from a higher SES to have access to more green space in their living environments to facilitate their social interactions (Maas et al., 2009). Nevertheless, this study also noted that overall, green space promoted a stronger sense of community by increasing neighbourhood emotional attachment in all settings (Maas et al., 2009).

Despite these findings, Dempsey's (2009) study showed no association between sense of community and the extent of greenery within the neighbourhood. This is surprising as perceptions of neighbourhood attractiveness and greenery were associated (Dempsey, 2009). There may not have been any association because it was acknowledged by the author that the quality of green space was not assessed, therefore the larger areas of green space may have been of a poorer quality (Dempsey, 2009).

Table 3. Key Studies Summary

Table 3: Key Studies Summary					
Article	Research Type	Demographics	Research Aim/Questions	Key Findings	Limitations
Cabrera, JF., & Najarian, JC. (2015). 'How the built environment shapes spatial bridging ties and social capital'	Quantitative Cross-sectional Two self-completed surveys online	Tucson, Arizona 91 residents completed survey 1; 56 residents completed survey 2	Explores the link between social capital and spatial bridging ties. Also looks at the relationship between spatial bridging ties and design features of the built environment.	An association was found between spatial bridging ties and the use of mixed-use amenities, suggesting mixed-use amenities such as restaurants and shops may facilitate bridging ties between residents.	Small sample size, with an overrepresentation of residents with children Cross-sectional study design (indicating only correlation)
Cattell, V., Dines, N., Gesler, W., & Curtis, S. (2008). 'Mingling, observing, and lingering: Everyday public spaces and their implications for well-being and social relations'	Qualitative Ethnographic methods of enquiry Discussion groups, observation and in-depth interviews	East London, Newham Multi Ethnic Area Total of 42 participants, with varying age groups and ethnicities	Investigated individual's experiences of public open spaces and looked at the association between public open space, social relationships and sense of well-being.	A wide range of public open spaces were found to have a positive influence on both individual and community well-being.	Discussion groups did not represent all social categories
Chile, L., Black, X., & Neill, C. (2014). 'Experience and expression of social isolation by inner-city high-rise residents'	Mixed-methods consisting of survey questionnaires, semi-structured interviews and focus group discussions using stratified random sampling	Residents of Auckland's inner-city high-rise apartments All age groups	To explore factors that contribute to social isolation for residents of inner-city high-rise apartment communities.	Age was an influencing factor on social isolation. Older adults reported the highest rates of social isolation.	Data saturation was not mentioned

Dempsey, N. (2009). 'Are good-quality environments socially cohesive? Measuring quality and cohesion in urban neighbourhoods'	Mixed Methods Questionnaire and Semi-Structured interviews Large-scale cross-sectional investigation undertaken as part of a larger research project	Six study site neighbourhoods in England 859 valid questionnaires, 102 telephone interviews	To investigate how features of the built environment can influence the social cohesion of urban residents.	Provides evidence on how certain features of the built environment can affect social cohesion for residents in local neighbourhoods. It was found that as the perception of neighbourhood attractiveness increases, so did sense of community and place attachment.	Medium-sized English cities with large student populations Subjective indicators employed Only six study sites examined
Francis, J., Giles-Corti, B., Wood, L., & Knuiman, M. (2012). 'Creating sense of community: The role of public space'	Quantitative Cross-Sectional Sub-Study of the RESIDential Environments (RESIDE) Project	Residents of new housing developments in Perth, WA Metropolitan Area	Investigated the association between sense of community and the presence of quality public space, as well as how often it got used.	Sense of community was significantly and positively associated with the perceived quality of neighbourhood public open space and shops.	Cross-sectional nature (cause cannot be determined) Self-administered survey (recall bias)
Jeffres, L., Bracken, C., Jian, G., & Casey, M. (2009). 'The impact of third places on community quality of life'	Quantitative Cross-sectional A national telephone survey (20mins)	US households, 477 respondents	To investigate the public's perception of third places, and whether they contribute to quality of life.	A significant finding was that regardless of where people go to meet with others, the fact that they feel they have access to third places enhances their perceived quality of life within their community.	Only 27% response rate

Maas, J., Van Dillen, SM., Verheij, RA., & Groenewegen, PP. (2009). 'Social contacts as a possible mechanism behind the relation between green space and health'	Quantitative Cross-Sectional Two datasets were combined, collected within the framework of the second Dutch National Survey of General Practice Qualitative	10,089 residents of the Netherlands	Explored whether social contacts were an underlying mechanism behind the relationship between green space and health.	More green space in the living environment was positively related to people's feelings of loneliness and shortage of social support.	Self-reported health indicators (potential for bias) Small-scale green space not included
Mouratidis, K. (2018). 'Built environment and social well-being: How does urban form affect social life and personal relationships?'	Mixed Methods A questionnaire survey and 10 qualitative in-depth interviews	Metropolitan area of Oslo, Norway 45 neighbourhoods in total	Investigated how social well-being was impacted by urban form, by focusing on social life and personal relationships.	Compact-city residents had more active social lives, had a larger network of close relationships, and stronger social support, which all contributed to a higher satisfaction with personal relationships.	Participants slightly older and more educated Cross-sectional study design
Prochorskaite, A., Maliene, V., Couch, C., & Malys, N. (2016). 'Housing stakeholder preferences for the "Soft" features of sustainable and healthy housing design in the UK'	Quantitative Cross-sectional An Online Survey	235 respondents in the UK completed the survey, of which 123 were "housing users" and 112 were housing developers	Focused on the "soft" features of sustainable housing and neighbourhood design that can impact health and well-being Investigated whether the opinions of housing users and housing providers were aligned.	Identified significant differences in opinions between the two groups for seven of the eleven 'soft' features. Also identified design features that were beneficial for social health.	Only one geographical area of the UK Non-probability sampling (results not as generalisable)

Raman, S. (2010). 'Designing a liveable compact city physical forms of city and social life in urban neighbourhoods'	Quantitative Case Study Observations, questionnaire surveys, mapping of social networks and secondary data sources	Six neighbourhoods in south-east England Neighbourhood layouts varied from street form, block form around a courtyard, tower block and tower on podium block	Aimed to examine the influence that neighbourhood design and layout had on social interaction and social networks. Also to examine the extent to which physical characteristics influenced the actual and perceived social activities taking place in the neighbourhood.	Communal spaces played an important role in high-density developments, because they reduced the distance between neighbourhoods in a social network and in promoting social interaction in general.	Small geographical area
Williams, P., & Pocock, B. (2010). 'Building 'community' for different stages of life: Physical and social infrastructure in master planned communities'	Qualitative Fourteen focus groups were conducted	68 people who live and/or work at newly developed master planned communities in South Australia and Victoria	Focused on the physical and social infrastructures that facilitate social connection and enable social capital for different groups of people within the Master-Planned Communities.	Familiarity, availability, and the enabling of social bridges contributed to the development of community and social capital in these residential areas.	Focused on Master-Planned Communities Over-representation of tertiary educated residents

Discussion

This paper reviewed how urban form promotes social health and the aspects of high- density environments that promote social health for residents. Despite limitations (discussed below), the evidence suggests that the association between the built environment and social health in high-density neighbourhoods is worth considering in attempting to design more socially inclusive cities in Australia. The following discussion outlines the key findings from the literature review; this is then followed by a discussion of the findings in relation to current national guidelines and frameworks on cities, planning and health.

Several studies in this review revealed that social interactions could be facilitated by the physical form and layout of neighbourhoods (Mouratidis, 2018; Cabrera & Najarian, 2015). The social benefit of high-density neighbourhoods in general is still a relatively new research area, which may explain why some findings were conflicted (Mouratidis, 2018; Raman, 2010). However, the majority of findings were in favour of mixed-land use design in facilitating social health, by providing more opportunities for interactions (Mouratidis, 2018; Cabrera & Najarian, 2015). In addition, there was good evidence that the degree to which the public facilities are maintained, along with perceptions of safety, can affect how connected people feel with others (Francis et al., 2012; Raman, 2010; Dempsey, 2009; Chile et al., 2014). Another major finding of this review was that third places facilitate social encounters, with their location and accessibility an important element in enabling social activities to take place. In total, seven papers had similar findings, suggesting the strength of this conclusion is quite strong (Cattell et al., 2008; Mouratidis, 2018; Francis et al., 2012; Raman, 2010; Dempsey, 2009; Williams & Pocock, 2010; Jeffres et al., 2009). Additionally, the review indicates that green space can positively influence health by increasing feelings of social support and decreasing feelings of loneliness in high- density areas, especially for vulnerable populations (Maas et al., 2009; Francis et al., 2012; Cattell et al., 2008).

In Australia, city planning is facilitated at the state level, with each state having a different set of planning policies. These tend to be legislative in nature and discussion of the findings in relation to each state-based policy is beyond the scope of this review. Nevertheless, the findings of this review can be considered in the context of three key national frameworks that are designed to inform the planning of healthy cities more generally; the Healthy Spaces and Places framework, the Healthy by Design framework, and the Smart Cities Plan.

The Healthy Spaces and Places Framework and the Healthy by Design Framework (Australian Local Government Association [ALGA], National Heart Foundation of Australia [NHFA], & Planning Institute of Australia [PIA], 2009; Heart Foundation, 2012) both recognise the benefits of high-density, mixed-land use neighbourhoods, but generally have a focus on walkability and physical health. The aim of these guidelines are to create shorter distances between destinations as a way to encourage people to use active transport and reduce car emissions, yet the guidelines fail to recognise that these design principles may also enhance social interactions. Although the focus of greater density and mixed-land use has been on improving physical and environmental aspects of health, the findings of this review suggest planning policies based on increasing densities and mixing uses could generally enhance opportunities for social encounters. The Smart Cities plan is currently silent on the value of urban form and social health (Australian Government Department of the Prime Minister and the Cabinet [AGDPMC], 2016).

In terms of public facilities, the Healthy Spaces and Places framework recognises attractive neighbourhoods and perceptions of safety as being important design features of a

neighbourhood, however again, this is in the context of being positively associated with overall physical activity and better mental health outcomes (ALGA et al., 2009). More positively, the Healthy by Design and Smart Cities frameworks recognise maintaining public space to a high standard, as these are the spaces that bring people together and build a sense of community (Heart Foundation, 2012; AGDPMC, 2016). This aligns with the findings of Francis et al. (2012), Raman (2010), and Dempsey's (2009) studies that found sense of community and social interactions were enhanced by high quality public facilities.

All of these national frameworks discuss the importance of third places, but currently do not acknowledge them for their social health benefits. The Healthy by Design and Healthy Spaces and Places frameworks have principles based on 'accessibility', but the emphasis is on user-friendly walking and riding routes (Heart Foundation, 2012; ALGA et al., 2009). Likewise, the Smart Cities plan acknowledges the importance of public spaces being easily accessible, however, does not state specifically that this is for social health benefits (AGDPMC, 2016).

Finally, the frameworks all recognise parks and open spaces as important design principles within neighbourhoods, but only emphasise green space for its physical health benefits (ALGA et al., 2009; Heart Foundation, 2012; AGDPMC, 2016). The Healthy by Design framework does however, have the objective to provide public green space within walking distance from dwellings, which aligns with the findings of this review (Heart Foundation, 2012). Both Maas et al. (2009) and Francis et al. (2012) found shorter distances from green space were linked with stronger sense of community, better health outcomes, and an increase in perceived social support. Similarly, the Smart Cities plan does discuss the importance of providing open green space to those who live in apartments, as they are without backyards (AGDPMC, 2016).

From the above, it can be concluded that social health considerations are not fully embedded across all national Australian guidelines. The major focus of national guidelines documents to date, is to create neighbourhoods mainly for physical health benefits, however the findings of this review reveal that social health considerations are an important element for the future development of planning and policy guidelines for Australian cities.

Limitations

A major limitation of this review was that while there is good evidence regarding high-density inner city living and physical health, there was limited evidence that focused on aspects of the built environment that promote social health within high- density areas. As a result, there were only 11 studies included in this review and although they were considered the highest quality of all the relevant literature, the assessment of study quality was undertaken by a sole researcher.

Furthermore, there were a limited amount of studies conducted in Australia, therefore literature from other western countries were included. While studies were only included if deemed comparable to the Australian context, this was a subjective process, which means some conclusions and recommendations drawn from these studies may not be applicable to Australia. These contextual limitations may be particularly problematic when considering that the densification of Australian cities is a relatively new phenomenon, compared particularly with European countries. In Australian cities, densification is occurring in parallel with gentrification, which may result in quite specific challenges for the social health of existing and incoming residents.

Another limitation of this review was the subjective element of measuring social health and health variables. Many of the studies discussed a lack of standardised measures for social health as a weakness, therefore affecting bias, internal validity, rigour and comparability of studies in this review. Additionally, the cross-sectional nature of majority of the studies is a general limitation. It is thus clear that there is a need for more research on the relationship between the built environment and social health.

Conclusion

Overall, this review provides further support for the notion that the way a neighbourhood is planned and designed can play a significant role in promoting social inclusion. This review also identified how high-density neighbourhoods more specifically, can be designed to promote social health within Australia. Mixed-land use areas were considered conducive to socially cohesive behaviour. Other aspects of the built environment found to encourage social connectedness were high quality and attractive public facilities and feelings of safety; the presence of easily accessible third places; and living within close proximity to green space.

The concept of designing high-density neighbourhoods to promote social health is a growing public health challenge, as the number of people living in apartments will continue to increase in response to population growth. Additionally, the rising rates of loneliness and isolation is a concern, as the health risks associated with these conditions have the potential to impact negatively on the future health and well- being of the Australian population (Holt-Lunstad et al., 2015).

The findings of this review suggest that social health is not entrenched across all areas of planning policy. Urban planning needs to ensure it is meeting the needs of both current and future communities, by paying more attention to social health. As there is no single sector that is responsible for improving social connectedness within Australian cities, it must be the joint effort of a range of sectors, including both the health and planning fields (Giles-Corti et al., 2012). This inclusive approach will assist in achieving socially inclusive communities longer term.

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