Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Female perspectives on housing quality and household characteristics, perceptions and challenges: Evidence from Australia

Christa Viljoen a, Braam Lowies a,c,*, Kurt Lushington b, Stanley McGreal a,d

a University of South Australia Business, University of South Australia, 37-44 North Terrace, Adelaide, 5000, Australia
b University of South Australia Justice and Society, University of South Australia, St Bernards Road, Magill, 5072, Australia
c Built Environment Research Institute, University of Ulster, Jordanstown Campus, Shore Road, Newtownabbey, Co. Antrim, BT37 OQB, United Kingdom
d University of South Australia Business, University of South Australia, 37-44 North Terrace, Adelaide, South Australia, 5000.

* Corresponding author. University of South Australia Business, University of South Australia, 37-44 North Terrace, Adelaide, South Australia, 5000.
E-mail addresses: christa.viljoen@unisa.edu.au (C. Viljoen), braam.lowies@unisa.edu.au, braam.lowies@unisa.edu.au (B. Lowies), kurt.lushington@unisa.edu.au (K. Lushington), ws.mcgreal@ulster.ac.uk (S. McGreal).

ARTICLE INFO

Keywords:
Housing conditions
Gender inequality
Females
Financial strain
Aging
Housing policy
Australia

ABSTRACT

In many societies, perceptions regarding housing and ownership rights is that it is mostly consigned to males rather than females. Housing is gendered around physical aspects, as a financial asset, and even in housing data to be a male preserve – excluding females and their perceptions. This important paper addresses this limitation in the literature by examining the views and perceptions of female participants in the Australian Housing Conditions dataset. More specifically this paper examines the significance of household structure, housing quality and characteristics of Australian woman and how it affects their financial strain. As a further dimension this paper also examines differences in women’s housing experience by age as older Australian women (above 65 years) have a higher likelihood to revert to substandard housing conditions and homelessness than younger Australian women (under 65 years). Logistic regression analysis shows a higher tendency towards financial strain in women under 65 years, those with either poor physical or mental health and those who were single or lone parents. These finding propose that women under 65 are at greater risk to experience household financial strain and poorer housing security. The paper argues that these results present challenges for Australian housing policy through increasing housing affordability. The analysis suggests that an increase in the availability of affordable housing will ease the financial strain and improve the mental health of Australian women. Moreover, an increase in the flexibility of housing arrangements may prove to be beneficial in providing additional housing solutions.

1. Introduction

Gender inequality and stereotyping remains a defining societal issue across a wide range of sectors. Reeves (2009), in reviewing the 2009 Global Report on Human Settlement, as an example, argues that little progress has been made to improve the position of women in planning sustainable cities. Housing is a case in point, with the perception in many societies, including developing and developed countries, that ownership rights rest with the male rather than the female. Rossi and Sierminska (2018), in a survey of 22 OCED countries, reported that female homeownership remains uncommon. In a seminal paper, Fox O’Mahony (2008), focusing on the US, argued that women still experience disadvantages in purchasing a house, although this inequality is seen to be more rooted in income, rather than gender, with income rooted in gender too, given the lower rate of pay for women. Deng et al. (2019) observed that women in China are disadvantaged by patrilineal family traditions with males recognised by the community and authorities as the head of household and the owner of family home. Gandelman (2009) found that homeownership rates for women are low in most Latin American countries and, moreover, that female headed households with higher incomes do not necessarily have greater homeownership rates. In Australia, a mortgage company observed that the goal of homeownership for Australian women is an elusive one (Wizard Home Loans, 2009).

Housing encapsulates many characteristics, the most basic of which is the fundamental requirement to provide shelter. It also has wider qualities. Housing is a signifier of social wellbeing: it provides identity, in addition to security and comfort, and it affords access to social networks, employment and services. These aspects, however, are often...
gendered with the physical components of housing typically held to be a male preserve while the softer elements such as sentiment, comfort and security considered as a female preserve (Fox O’Mahony, 2008). Housing is also an asset and signifier of wealth: it is a tradable commodity, it is an income-producing good and is viewed by most financial commentators as a positive investment strategy, especially for retirement (Lusardi & Mitchell, 2007; Ong et al., 2013). These aspects are also influenced by gender with the house as a financial asset, typically held to be a male preserve.

The reporting of housing data itself can also be gendered and typically women are not perceived to be the household referencing person, thereby obscuring the voice of women and their contribution to our understanding of housing. In this context, Moghadam and Rafieian (2019) observed that urban planners still have limited knowledge about gender complexity. In Australia, the geographical focus of this paper, the Australian Bureau of Statistics (ABS) report on homeownership rates based on the age of the ‘reference person’ and not the respondent’s gender (ABS (Australian Bureau of Statistics), 2019).

The aim of this paper is to address this limitation in the literature through an examination of the views and perceptions of female participants in the Australian Housing Conditions Dataset (Baker et al., 2019). The analysis sought to focus on research questions relating to the significance of household structure, housing quality, and characteristics of women in Australia and how these factors affect the financial strain of households. The study also examines an additional factor known to impact the housing experience of Australian women, namely, age. Older Australian women are more likely to live in substandard housing and be more vulnerable to homelessness (Darab & Hartman, 2013; Thredgold et al., 2019). Indeed, the Australian Human Rights Commission (2019) argues that the financial situation of older women, their housing preferences, and their individual circumstances should be considered together, to improve their financial and housing security later in life. Thus, a further dimension of this paper is to examine whether women aged 65 years and above, i.e. those typically representing households in retirement, differ to those still of active working age, i.e. women below the age of 65.

The paper is structured as follows. A literature review examines the somewhat limited base that exists concerning housing conditions, quality of female perspectives together with the weaker housing experience of women in Australia. The methodology and the data source underpinning the analysis is briefly presented. The results are across two sections, first descriptive and inferential statistics covering a range of thematic issues are discussed, followed by modelling of the influence of key variables identified from the inferential analysis. The paper concludes with a discussion of wider issues and interpretations arising from the analysis and draws conclusions.

1.1. Literature review: housing conditions, quality and females

Some of the more salient literature on gender and housing quality comes from the psychology discipline and paradoxically is limited from a built environment perspective, reinforcing the originality of this study. Given this context, a particularly interesting paper is the longitudinal investigation by Wells and Harris (2007) from the US which examined the relation between housing quality and psychological distress among low-income women relocating from inadequate dwellings to newly constructed homes. Set against the background of the greater likelihood of women in the US (14.1%) living in poverty than men (11.1%), the paper raised questions relating to housing and mental health amongst low-income women. The study showed significant improvements amongst women, comparing pre-move to post-move, across variables measuring housing quality, psychological distress, and social withdrawal. Social withdrawal was found to mediate the relation between housing quality and mental health and improvement in psychological distress. The authors noted a statistically significant difference in housing quality and reduced psychological distress, and that aspects of housing quality, such as crowding, play a potent role in mental health.

An earlier study by Evans et al. (2000), also from the US, is important in exploring differences of women’s perceptions of physical attributes to housing quality and the influence that housing quality has on women’s psychological stress. Their research was based on young children and their mothers living in high rise buildings that presented situations of restricted play and social isolation. Two samples, one of women living in poor-quality housing and the second sample of women in high-quality housing, were analysed in relation to six subscales of housing quality namely cleanliness/clutter, indoor climate conditions, privacy, hazards, structural quality, child resources, and a separate subscale for neighborhood quality. Using factor analysis, each of the subscales, except for indoor climate conditions, significantly differentiated between poor and quality housing, and controlling for income difference between the two samples it was found that high quality housing leads to lower levels of psychological distress and vice versa, leading Evans et al. (2000) to conclude that improved housing quality can lead to improved mental health.

In a similar vein, Coley & Leventhal (2012) focused on housing characteristics and its contribution to children’s wellbeing. Based on longitudinal data over a six-year period on low income families in three US cities, a bioecological perspective was used to explore associations between housing contexts and children’s development. The child’s biological mother (90%) or primary female caregiver (10%, all referred to as mothers) was the primary respondent in each family. The study shows that poor quality housing was consistently and strongly predictive of children’s wellbeing and that those children who resided in lower quality housing showed greater emotional and behavioural problems than their peers. Coley & Leventhal (2012) surmised that low-quality housing may induce stress in mothers and female caregivers, increase mental health problems, and limit the ability to regulate family activities, in turn affecting children’s socioemotional functioning.

Snyder et al. (2006) examined race and residential variation in female-headed households with children in the US, with the aim of understanding the pattern of economic resources available to children in different types of female-headed households and the degree to which poverty is reduced by household type. This paper focused more on household type rather than on housing conditions and showed that poverty was highest among single female-headed households with children in non-metro areas. Grandmother headed households with children were shown to have the highest odds of poverty, significantly higher than those headed by a single mother. Furthermore, the earnings of a male partner are especially important for non-metro female-headed cohabiting households with children—this income source cuts poverty in half.

Taking a wider perspective, Feijten and Mulder (2005) examined life-course experiences such as partnership formation, the transition to parenthood, divorce and unemployment on housing quality, with the latter interpreted as tenure and dwelling size. The findings indicate that most individuals start in rental housing and subsequently make the transition to homeownership. People with a middle or high level of education were shown to have a higher propensity to live in high quality housing than those with low levels of education and with increasing age the probability of living in high quality housing increased for the highly educated compared with middle and low levels of education. Unemployment amongst males was considered to have a long-term impact on housing quality though, and significant for this paper, female unemployment of those in a partnership is less decisive in terms of housing quality.

\[\text{2}\]

The authors are mindful that there are different definitions of ‘housing quality’ and ‘housing conditions’ in the literature. However, in the context of this study ‘housing conditions’ refers to the physical attributes and condition of the house (such as necessity of repairs, etc.). ‘Housing quality’ refers to a mental and personal perception and feeling of the house (such as impact on mental health and wellbeing).
quality. Coleman et al. (2016) further explored the issue of age, in particular the experience of older adults ageing in-place and the burden that home maintenance places on this age cohort in a study of retirees in New Zealand. Specifically, with regards to women, the authors observed that when financially constrained, female recipients reported that the cost of maintenance, knowing what to do, and securing reliable help were all sources of stress and worry. Furthermore, female recipients reported that isolation (and abandonment) from family was an issue especially where help with maintenance was needed. Asking for assistance with maintenance, might negatively reflect on their competency and therefore capacity to remain in-place which resulted in reduced help seeking behaviour despite apparent need.

Turning to Australia, several studies have articulated gender inequalities. Baker and Tuilly (2008) observed that in women in general, and female headed households in particular, are over-represented in terms of being economically and socially disadvantaged. Women more often than men are the head of single parent households, with 82% of single parent families being headed by a female (ABS, 2013). Inequalities in salaries (Cassells et al., 2017), greater reliance by women on part-time work and less skilled employment (Jefferson & Preston, 2005; Warren, 2006) and the reduced ability to accrue superannuation funds over their working lives (Australian Human Rights Commission, 2019; Thredgold et al., 2019) have, according to Everingham et al. (2007) meant that single women often cannot afford to retire, and the financial assistance provided by government is insufficient to make retirement an option for these women. Furthermore, those older single women who have not accumulated enough wealth in the form of housing to provide financial security later in life have to rely on the rental sector (Darab & Hartman, 2013).

Cornell (2019) has discussed how the private rental market in Australia can be ruthless for people who are on a fixed income or pension. Thus, rental affordability is a concern for older people, especially older women (Australian Human Rights Commission, 2019) with Baker and Tuilly (2008) and Oslob and Winters (2005) showing that women in private rentals are financially more vulnerable, and the uncertainty associated with rent increases their overall levels of economic disadvantage. Thus, most renters in the social rental market are women (62%), and single households comprise the largest proportion of social renters (55%). Those who live in public rental accommodation often experience financial challenges and again older single women are most at risk (Gong et al., 2014).

However, a study by Kupke et al. (2014) found that the propensity of females to purchase property matched and in some cases even exceeded that of male headed households. The significance of Kupke et al. (2014) lies in the implication that, if given the same opportunities, homeownership is as important, or perhaps even more important to women, compared to men. Indeed, for some single older women in Australia, the family home represents a larger portion of wealth when compared to other cohorts (Jefferson & Ong, 2010; Ong et al., 2013). However, Ong et al. (2019) observed that, for older adults who still have a mortgage, many find it more difficult to pay expenses on time with an increased tendency to make use of superannuation lump-sums to pay off their mortgages. In the long run, this has the effect to reduce monthly income streams and can increase financial strain notably for older women, who have lower levels of superannuation savings. Indeed, the analysis by Ong et al. (2013) shows that the percentage of older single women with mortgages is higher compared to couples or single men.

2. Methodology

This study uses the Australian Housing Conditions Dataset and Technical Report (Baker et al., 2018, 2019). The dataset is based on a large-scale survey, funded by the Australian Research Council (ARC) to gather robust information on the housing conditions of Australians. It was initiated due to the outdated evidence, with the Australian Housing Survey the last survey conducted that focused on housing conditions (ABS, 1999). Baker et al. (2016) argued that the Australian housing market has changed significantly over this time period with increasing levels of affordability, stress and undersupply of housing, as well as access and quality issues.

The data were collected by conducting a total of 4501 interviews across three Australian States: South Australia, Victoria, and New South Wales using a random stratified sampling method. Dual-frame sampling was developed including both mobile phones (randomly generated) and landlines, sourced from the 2015 Electronic White Pages. For landlines, interviews were conducted with the person with the last birthday over the age of 18 years whereas for the mobile sample, if the person answering the call was over 18 years, the interview was conducted.

Interviews by questionnaire were conducted between August and October 2016 to run parallel with the collection of the 2016 ABS Census data and involved the use of computer assisted telephone interviews (CATI). Interviews were carried out by trained interviewers from the Population Research and Outcomes Studies (PROS) in the School of Medicine, Faculty of Health Sciences at The University of Adelaide. The conduct of the survey was approved by The University of Adelaide’s Human Research Ethics Committee in June 2016. The data used in this study were weighted using iterative proportional fitting (raking) according to the probability of selection within the household and by age group, gender and area (metropolitan/country) for each selected state. To reflect the structure of the state and in accordance with Dal Grande et al. (2015), benchmarks were derived using the ABS Estimated Residential Population (ABS, 2015).

The analysis is in two stages. First, descriptive and inferential statistics are used in the analysis of the distribution of responses across a series of variables derived from specific questions in the survey and structured on a thematic basis (Section 4). This is supported by inferential tests (chi-square, t-test) to assess significant differences in response by age group: those under 65 and those aged 65 and above. The aim is to explore differences in perception of female respondents in what traditionally might be considered a pre-retirement cohort and a retired cohort with the latter including Baby Boomers and the Silent Generation (Dries et al. 2008). Second, those variables shown to be significant are then considered as candidate independent variables in the modelling of the financial strain of households using a binomial logistic regression. As discussed in Section 5 prior to model development, the candidate variables were assessed using appropriate non-parametric tests of association (phi and Cramer’s V).

3. Survey results: descriptive and inferential analysis

The analysis is based on responses of 2581 females and structured on thematic issues.

3.1. Household and demographic structure

Four household structures prevail: couple with children (31%, n = 795), couple with no children (29%, n = 743), lone person households (27%, n = 691) and one parent families (7%, n = 176). The latter two are exclusively female-headed households adding to the richness of this analysis. Furthermore, there is a number of households with three or more adults (n = 540) suggesting the presence of more complex household structures. The common denominator across these household types is the female perspective. Most women in the survey were aged over 45 (45–54 (20%, n = 503), 55 to 64 (24%, n = 619), 65 to 74 (23%, n = 591), and 75+ (22%, n = 572). Circa 8% of the sample (n = 212) are aged 35 to 44 and the remainder are in the younger age groups. Given these demographic splits, sub-level analysis specifically explores differences by broad age category focusing on older females, aged 65 and above, and those below 65.
3.2. Housing tenure

Three principal tenures types are apparent: owned-outright (63%, n = 1635), owned with a mortgage (24%, n = 626) and rented (10%, n = 266). The survey shows a higher representation of females over 65 (83%, n = 964) owning outright compared to 47% (n = 671) of those under 65. Only 5% (n = 57) of those over 65 still have a mortgage in contrast to 41% (n = 569) of those under 65. There is little difference in the percentage renting, circa 10% (n = 111) of the older age group compared to 11% (n = 155) of those below 65. Overall, the difference in tenure is highly significant (chi-square 0.001) and lends support to the findings of Stebbing and Spies-Butcher (2016) concerning the high levels of outright homeownership in the older age cohort.

The length of residency at the current address varies from less than one year to, in the case of several respondents, in excess of 50 years. The high values for the mean (21.62 years) and standard deviation (14.34) reflect the long residency of women 65 and above (mean = 26.09 years) compared to those below 65 (mean = 17.94) and is highly significant (t = 14.82, p = 0.001). Furthermore, 75% (n = 1937) expressed an intention to stay in their current house. Those intending to move was highest in relative terms for renters 32% (n = 84), though largest in volume terms amongst households owning outright (n = 198 or 12% of this tenure).

3.3. Housing type and physical characteristics of properties

Separate (detached) houses were the most common dwelling type (83%, n = 2140). Collectively the broad housing category semi-detached/terraced/row accounts for 10% (n = 249) and flat/apartment 7% (n = 182). As indicated in Fig. 1, a higher percentage of under 65 lived in separate houses (88%, n = 1251) compared to the above 65 age group (76%, n = 889). The latter have a higher representation in the semi-detached/terraced/row housing type (13% compared to 7%) and for flats/apartments (10% against 4% for those below 65). Differences by housing type by age are strongly significant (chi-square = 61.28, p = 0.001).

The mean age of dwellings is 38.96 years with no significant difference apparent in the age of properties occupied between the two demographic groups (t = 1.14, sign = 0.26). Most respondents (87%, n = 2258) considered that their houses were free of any major building problems, though 323 (13%) considered this not to be the case, of which 61% were below 65 (chi-square = 6.03, p = 0.01) suggesting a greater perception of the need for repair amongst the younger cohort. The major building problems identified were rising damp (n = 48), mould (n = 37), cracks in walls/floor (n = 165), sinking/moving foundations (n = 45), roof defect (n = 43). Regarding the need for repairs a wider spread of responses was apparent, as indicated in Fig. 2. 43% (n = 1113) of respondents indicated no need for repairs, 36% (n = 938) low need and 15% (n = 398) moderate need. Only 3% (n = 76) suggested that repairs were essential of which 66% (n = 50) were in the below 65 group and 1% (n = 42) described repairs as essential and urgent of which 74% (n = 31) were in the younger age group (with chi-square = 69.71, significant at 0.001 level). These observations suggest that the younger age cohort is more perceptive of the need for repairs to their homes. Furthermore, the percentage of owners (43.3%) and renters (42.8%) indicating no need for repairs is nearly identical. However, differences arise in the other categories of “need”. Meaning that overall, there is a significant difference between owners and renters (chi-square = 29.24, p = 0.001). Similarly, in analysing by age those below 65 show the same difference by tenure (chi-square 26.38, p = 0.001). However, and most interestingly, of those 65 and above there is no significant difference at 0.05 level between owners and renters (chi-square 8.55, p = 0.07).

Most of the households (84%, n = 1887) in the home ownership tenures have undertaken some form of substantial change to their property, the most significant being replacing electric/gas hot water system (28%, n = 625), installation of solar electricity (27%, n = 600), insulation (34%, n = 761), ceiling fans (35%, n = 787), modification for age/disability (14%, n = 308), major kitchen renovation (40%, n = 904), major bathroom renovation (35%, n = 793), and additional rooms/extension (27%, n = 618). Households not making any significant modification does not differ across the two age groups (16.2% and 16.9%, chi-square = 0.22, p = 0.64). Self-assessment of the physical quality of their dwelling shows a high degree of satisfaction by women with 85% rating as excellent/good (n = 2193) and a further 14% (n = 351) as average. Only 1% (n = 34) consider their house as poor/very poor. Those 65 and above place greater emphasis on excellent/good ratings and a higher percentage below 65 considered their property as excellent/good (44% of owners and 45.9% of renters). Importantly

![Fig. 1. Dwelling type by age of respondent.](url)
25.5% of renters rated their properties as “average” (compared to 12.4% of owners) and 41.1% as “poor/very poor” (compared to 0.9% owners). Overall, these differences are statistically significant (chi-square 68.25, p = 0.001). Analysis by age shows the same outcome though the significance level reduces to p = 0.01 for the 65 and above suggesting slightly less differentiation by the older female cohort.

3.4. Financial costs and wellbeing

Costs associated with repairs and maintenance varied widely with 37% below AU$1 000, suggesting limited renovation, but ranging as high as AU$250 000. The high value of standard deviation (s = AU$15 614), appreciably above the mean of AU$4 775, highlights the wide cost distribution. A significant difference is apparent in the respective mean costs of repairs/maintenance: AU$5669 and AU$3383 (t = 2.20, sign = 0.02) between those below 65 and those above 65.

The survey suggests potential energy poverty amongst respondents with 6% (n = 161) indicating problems in keeping their house warm during winter with a similar response regarding the ability to be comfortable during the summer (6%, n = 144); and 53 (2%) were neither able to keep warm in the winter nor cool in the summer. The incidence of energy poverty is seemingly higher for households with the respondent below 65 (8%, n = 111) compared to the older age group (4%, n = 50) in terms of not being able to keep warm in the winter (chi-square = 13.56, p = 0.001) and cool in the summer (8%, n = 108 for those under 65; 3%, n = 36 for 65 and above, chi-square = 25.10, p = 0.001). Use of these energy sources is broadly the same across the two age cohorts though importantly for solar energy there is a marginally greater utilization of this growing alternative amongst the below 65 cohort (17%, n = 246) compared to the older age group (15%, n = 170).

The overall level of financial strain, 13% (n = 346) is greater than that for potential energy poverty suggesting that other factors are impinging on household budgets. This is most acute for those below 65, with 20% (n = 289) indicating that household members have experienced financial problems within the 12-month period preceding the survey. Financial strain was most notable for lone parent (49%) and lone person households/female-headed (27%). For the 65 and above age group, the incidence of financial strain while not absent is lower (5%, n = 57), the difference being statistically significant (chi-square = 132.78, p = 0.001).

3.5. Health and wellbeing

Personal health was considered in generally favourable terms: 23% (n = 587) excellent, 34% (n = 882) very good and 29% (n = 757) good. In contrast 10% (n = 252) rated their health as fair and 4% (n = 97) as poor and were predominately 65 and above (13%, n = 151 fair and 5%, n = 52 as poor). Overall, there is a significant difference between the age groups in relation to perception on health (chi-square 65.10, p = 0.001). Medical conditions that were most prominent included hypertension (31%, n = 794), various allergies (22%, n = 560) and asthma (16%, n = 415). The expectation of greater prevalence of these conditions amongst the older age group is significant for hypertension (chi-square = 210.42; p = 0.001) and coronary heart disease/angina (chi-square = 114.29; p = 0.001). Likewise, for a long-term health condition, impairment or disability that restricts daily activity, those 65 and above were much more likely to be impacted (29%, n = 333) compared to 17% (n = 243) of the group below 65 (chi-square = 48.39, p = 0.001).

Most respondents, 82% (n = 2113), did not consider themselves to have had any mental health issues over the 12 months prior to the survey, although 18% did indicate some incidence. In this context, 10% (n = 247) indicated that they had suffered from anxiety, 9% (n = 222) from depression and 7% (n = 174) from stress related problem. In contrast to physical health conditions, mental health issues were more prevalent in the below 65 group with significant differences apparent for anxiety (11%, n = 160 for those under 65; 8%, n = 87 for 65 and above, chi-square = 10.68, p = 0.0001). Likewise, for depression (11%, n = 154 compared to 6%, n = 68, chi square 20.43, sign = 0.0001) and stress (8%, n = 119 compared to 5%, n = 55, chi square 13.64, sign = 0.0001).

The ability to feel safe with one’s home is central to health and wellbeing, a factor which can be of concern to lone female households in particular. However, respondents had a strong sense of safety in relation
to their home with 99% (n = 2547) feeling either very safe or safe during the daytime and similarly during the night-time 97% (n = 2514). Those feeling unsafe after dark were small in numbers (n = 37) and spread across both age groups with a higher number (22) in households below 65 of age. Indeed, a significant difference is apparent between the age groups with respect to feeling safe after dark (chi-square 16.76, sign = 0.001) while no significant difference is apparent in relation to feeling safe during the day (chi square 6.09, sign = 0.11).

4. Modelling financial stress of survey respondents

The analysis shows that 13% (n = 346) of women considered that members of their household had experienced some form of financial strain in the 12 months prior to the survey. Indeed, 25% of this subgroup (n = 88) sought financial assistance from family/friends. Financial strain arose from several sources with utility bills including electricity and gas (27%, n = 94) and car registration/insurance (16%, n = 56) being those expenditure items presenting the greatest challenges. The ability to pay either the mortgage/rent, appears to have impacted on fewer (11%, n = 39) suggesting that a priority of households is to pay for their property. Furthermore, payment of minimum monthly credit card balances (8%, n = 26) and heating their home (7%, n = 25), in relative terms, presented less difficulties. As sample sizes become increasingly smaller when dis-aggregated across specific instances, the over-arching generic variable concerning whether “in the last 12 months has there been any times where members of the household have experienced financial strain”, is used as the dependent variable in a binomial logistic regression that seeks to model the main factors contributing to financial strain.

The independent variables are key issues identified from the inferential analysis. As most of these, in common with the dependent variable, are of a categorical nature the strength of association between the variables was initially tested to reduce potential multicollinearity. Strong associations (phi coefficient and Cramer’s V) for categorical variables exist where the value of the coefficients is in excess of 0.31. Using this criterion, both tenure and dwelling type had high coefficients with several variables: for example, tenure and age of respondent phi = 0.431, tenure and family structure phi = 0.449; dwelling type and number of bedrooms phi = 0.597. Likewise, strong associations were apparent amongst certain physical building characteristics and between assessed health variables. Hence the number of variables entered in the regression model was reduced. Furthermore, recoding of some variables mainly due to potential violations occurring from small numbers in categorical variables and also to allow for non-responses reduced the useable sample size to 2502 observations. The variable thermal comfort is a combination of responses to two questions concerning the ability to keep the house comfortably warm in winter and to keep comfortable during hot summer weather.

The model (Table 1) highlights the key variables in explaining those factors that are central to financial strain according to females. Interestingly these are primarily health and socio-economic variables rather than issues relating to the property. Diagnostics are consistent with expectations from binary logistic models, the classification table yields an 87.7% correct prediction and the pseudo $R^2$ (Nagelkerke) is 0.21, low, but again typical of the technique.

Age is strongly significant, the negative sign and low value of Exp (B) indicates the lower likelihood of financial strain for those aged 75 and above. Other significant factors driving financial strain are mental health, the odds ratio indicating that the perception of financial strain is increased by a factor of 2.619 relative to those respondents not experiencing mental health issues. Likewise, general physical health has a significant impact with respondents who considered their health was fair/poor adding to the financial strain by a factor of 1.794 relative to those having good to excellent health. However, hypertension was not significant. Being a single/lone parent household increases financial strain by a factor of 1.854 and as discussed, inferential tests suggested that financial strain, where apparent, was more prevalent in households for which the respondent was under 65. There is evidence that thermal comfort ($\phi = 1.721$) has an impact on financial strain through the added costs of energy. Major building problems/defects are not significant at the 0.05 level. However, the cost of repairs/maintenance to property when relatively low (below AU$2500) was significant suggesting that for lower income households, modest repairs can add to financial strain.

5. Discussion and conclusion

This study addresses an important gap in our understanding, namely, the female perspective of housing quality and household characteristics, perceptions and challenges. Housing and household surveys typically assume the respondent is male. This is despite the widespread understanding that women, compared to men, will have different expectations, both from a financial and personal point of view when it comes to housing. Women are often financially more vulnerable due to gender pay gaps and lower levels of superannuation contributions and savings. These factors impact on their ability to secure homeownership and to pay housing related expenditure. A lack of financial wellbeing may have detrimental financial implications, such as having to move into private, or public rental accommodation. It could also have negative personal and emotional consequences and may impact on mental health. For single parent households these financial concerns may have a more significant impact. Older single women of future generations, who may have no option but to be lifelong renters due to the inability to become a homeowner, may also have financial concerns. The greater longevity and consequently the need for increased formal care extending into later old age of women further underlies the critical role that housing can play in both the economic and health of women.

Most women in the present study represented a household that owned their housing outright, lived in detached houses and reported a high degree of satisfaction with their dwellings. This was especially evident in women 65 and above. Regardless of age, most women liked where they lived and had not moved location in the past five years. They also expressed a high level of satisfaction with the physical quality of their dwellings. Only a small minority of women and predominantly those under 65 reported energy poverty or the ability to keep warm in winter and cool in summer. House mortgages were more likely where those under 65. There is evidence that thermal comfort indicates the lower likelihood of financial strain for those aged 75 and above. Other significant factors driving financial strain are mental health, the odds ratio indicating that the perception of financial strain is increased by a factor of 2.619 relative to those respondents not experiencing mental health issues. Likewise, general physical health has a significant impact with respondents who considered their health was fair/poor adding to the financial strain by a factor of 1.794 relative to those having good to excellent health. However, hypertension was not significant. Being a single/lone parent household increases financial strain by a factor of 1.854 and as discussed, inferential tests suggested that financial strain, where apparent, was more prevalent in households for which the respondent was under 65. There is evidence that thermal comfort ($\phi = 1.721$) has an impact on financial strain through the added costs of energy. Major building problems/defects are not significant at the 0.05 level. However, the cost of repairs/maintenance to property when relatively low (below AU$2500) was significant suggesting that for lower income households, modest repairs can add to financial strain.

Most women in the present study represented a household that owned their housing outright, lived in detached houses and reported a high degree of satisfaction with their dwellings. This was especially evident in women 65 and above. Regardless of age, most women liked where they lived and had not moved location in the past five years. They also expressed a high level of satisfaction with the physical quality of their dwellings. Only a small minority of women and predominantly those under 65 reported energy poverty or the ability to keep warm in winter and cool in summer. House mortgages were more likely where those under 65. There is evidence that thermal comfort indicates the lower likelihood of financial strain for those aged 75 and above. Other significant factors driving financial strain are mental health, the odds ratio indicating that the perception of financial strain is increased by a factor of 2.619 relative to those respondents not experiencing mental health issues. Likewise, general physical health has a significant impact with respondents who considered their health was fair/poor adding to the financial strain by a factor of 1.794 relative to those having good to excellent health. However, hypertension was not significant. Being a single/lone parent household increases financial strain by a factor of 1.854 and as discussed, inferential tests suggested that financial strain, where apparent, was more prevalent in households for which the respondent was under 65. There is evidence that thermal comfort ($\phi = 1.721$) has an impact on financial strain through the added costs of energy. Major building problems/defects are not significant at the 0.05 level. However, the cost of repairs/maintenance to property when relatively low (below AU$2500) was significant suggesting that for lower income households, modest repairs can add to financial strain.

Table 1

| Variable | B     | S.E.  | Wald  | Sig. | Exp (B) |
|----------|-------|------|-------|------|---------|
| Age      | -1.851| .206 | 80.442| .000 | .157    |
| single or lone parent households | .617  | .164 | 14.233 | .000 | 1.854 |
| general health | .584  | .207 | 7.945  | .005 | 1.794 |
| Hypertension | .285  | .173 | 2.712  | .100 | 1.330 |
| mental health in the last 12 months | .963  | .165 | 33.891 | .000 | 2.619 |
| thermal comfort | .543  | .216 | 6.316  | .012 | 1.721 |
| major building problems | -.372 | .203 | 3.356  | .067 | .689 |
| cost of repairs to property none | .325  | .149 | 4.725  | .030 | 1.384 |
| cost of repairs to property < AU $2500 | .025  | .057 | .002  | .965 | 1.025 |
| intention to move | .352  | .181 | 3.375  | .066 | 1.394 |
| main sources of energy or fuel: solar | .168  | .199 | .710  | .399 | .1183 |
| Constant | -2.008| .242 | 68.585 | .000 | .134 |

Habitat International 105 (2020) 102276
which tended to be more prevalent in women under 65. A significant minority of women reported financial strain, especially women under 65. Logistic regression analysis shows a higher tendency towards financial strain in women under 65, those with either poor physical or mental health, and those who were single or lone parents. The relationship between financial strain and health is not surprising. Health-care costs in Australia between 2006/07 and 2016/17 have increased by 81% (AIHW, 2018). For older people, health care cost comprises a larger part of personal budgets due to a deterioration in health and increase in disability with age (McConnell, 2013). This is especially the case for older women with 66% (compared to 50% of men) above 65 projected to require some form of formal care during their lifetime (AIST, 2016). To a lesser degree, financial strain was greater in women who reported poor thermal comfort and had difficulty meeting the cost of house repairs and maintenance.

In 1994, Australia reformed the pension-eligibility age for women from 60 to 65 and in 2014 initiated a progressive increase in the pension-eligibility age of six months every two years, to 67 by July 1, 2023 (Olapador, 2014). This reform is reported to disproportionately affect poorer households, especially single women and renters (Morris, 2016). Partly consistent with the latter findings we found that financial strain was higher in women who were single or lone parents and that financial strain was higher in women who were under rather than over 65. As these age women, if their circunstances do not improve, their financial concerns will increase, rather than improve in the long run. Women under 65 also reported poorer mental health which was strongly associated with financial strain. Indeed, middle-aged Australian women who do not own their own homes are vulnerable to greater financial strain in older age (Darab et al., 2018), are more likely to experience household financial stress and psychological distress due factors such as divorce (André et al., 2019; McCarthy & Simpson, 1991), unemployment (Taylor et al., 2017) and poor health (Gibson et al., 2011). The women under 65 are also likely to have been exposed to the debt-funded crises of the recent decade leaving them more vulnerable than their older peers (Wood et al., 2017). In the US, women have been impacted more severely by the current COVID-19 pandemic, with more women having lost their jobs than men (Schmidt, 2020). Furthermore, research in China shows that women reported significantly higher post traumatic stress symptoms (PTSS) than men during the pandemic (Liu et al., 2020).

The association between financial stress and both physical health and mental health is well described (Asebedo & Wilmart, 2017; Choi, 2009; Frankham et al., 2020; Sturgeon et al., 2016). Although the relationship is bidirectional, strategies which reduce financial stress are reported to result in physical and mental health gains. For example, according to White et al. (2018) financial education programs in twenty single low income African American women improved their wellbeing and health. Collins & O’Rourke (2011), in a review of US homeownership education and counselling programs reported that they are effective at improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving timely payments and thereby housing security. As yet, the effectiveness of increasing financial capability on the homeownership improving tim
Evans, G. W., Wells, N. M., Chan, H. Y. E., & Saltzman, H. (2000). Housing quality and mental health. *Journal of Consulting and Clinical Psychology, 68*(3), 528–530.

Everingham, C., Warner-Smith, P., & Byles, J. (2007). Transforming retirement: Re-thinking models of retirement to accommodate the experiences of women. *Women’s Studies International Forum, 30*(6), 512–522.

Feijen, P., & Mulder, C. H. (2005). Life course experience and housing quality. *Housing Studies, 20*(4), 571–587.

Fox O’Mahony, L. (2008). Repossessing ‘home’: A re-analysis of gender, homeownership and debtor default for feminist legal theory. *William and Mary Journal of Women and the Law, 14*(3), 423–494.

Frankham, C., Richardson, T., & Maguire, N. (2020). Psychological factors associated with financial hardship and mental health: A systematic review. *Clinical Psychology Review, 77*(2020), 101852.

Gandelman, N. (2009). Female headed households and homeownership in Latin America. *Housing Studies, 24*(4), 525–549.

Gibson, M., Thomson, H., Kearns, A., & Petticrew, M. (2011). Understanding the psychosocial impacts of housing type: Qualitative evidence from a housing and regeneration intervention. *Housing Studies, 26*(4), 555–573.

Gong, C., Kendig, H., Harding, A., Miranti, R., & McNamara, J. (2014). Economic disadvantage among older Australians: Producing national and small area profiles. *Australian Journal of Regional Studies, 20*(3), 512–539.

Jefferson, T., & Ong, R. (2010). Profiling gender differentials in asset and debt portfolios in Australia. Centre for Research in Applied Economics. Research Paper 201004.

Jefferson, T., & Preston, A. (2005). Australia’s ‘other’ gender wage gap: Baby Boomers and compulsory superannuation accounts. *Feminist Economics, 11*(2), 79–101.

Klapdor, M. (2014). Changes to support for pensioners and retirees, *Budget Review 2014-15*. Available at: https://www.aph.gov.au/about_parliament/parliamentary_departments/parliamentary_library/pubs/rp/budgetreview201415/pensioners accessed 5 April 2020.

Kupke, V., Rossini, P., McGreal, S., & Yam, S. (2014). Female-headed households and achieving home ownership in Australia. *Housing Studies, 29*(7), 871–892.

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., Wu, L., Sun, Z., Zhou, Y., Wang, Y., & Liu, W. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry Research, 287*(May 2020), 112921.

Lunardi, A., & Mitchell, O. S. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics, 42*(1), 35–44.

McCarthy, P., & Simpson, B. (1991). Issues in post divorce housing: Family policy or housing policy? *Aldershot: Avebury*.

McConnell, M. (2013). Behavioral economics and aging. *Journal of the Economics of Ageing, 1*, 83–89.

Moghaddam, S. N. M., & Rafieian, M. (2019). What did urban studies do for women? A systematic review of 40 years of research. *Habitat International, 92*(2019), 102047.

Morris, A. (2016). *The Australian dream: Housing experiences of older Australians*. Clayton, Victoria: CSIRO Publishing.

Olsberg, D., & Winters, M. (2005). Ageing in place: Intergenerational and intrafamilial housing transfers and shifts in later life Australian housing and urban research institute, *final report No. 88*. Melbourne: Australian Housing and Urban Research Institute.

Ong, R., Hallser, M., Wood, G., Jefferson, T., & Austen, S. (2013). Asset debt and the slowdown of housing equity by an ageing population Australian housing and urban research institute, *positioning paper No. 153*. Melbourne: Australian Housing and Urban Research Institute.

Ong, R., Wood, G. A., Cigdem, M., & Salazar, S. (2019). Mortgage stress and precarious home ownership: Implications for older Australians *Australian housing and urban research institute, final report No. 319*. Melbourne: Australian Housing and Urban Research Institute.

Reeves, D. (2014). Putting women and gender in the frame – a consideration of gender in the global report on human settlement planning sustainable cities 2009. *Habitat International, 43*(2014), 293–298.

Rossi, M., & Sierrinska, E. (2018). Wealth and homeownership: Women, men and families. *Switzerland: Springer*.

Rowley, S., James, A., Gilbert, C., Gurran, N., Ong, R., Phibbs, P., Rosen, D., & Whitehead, C. (2016). Subsidised affordable rental housing: Lessons from Australia and overseas *Australian housing and urban research institute, final report No. 267*. Melbourne: Australian Housing and Urban Research Institute.

Schmidt, S. (2020). *May 9* Female unemployment: Women have lost more jobs than men from the pandemic. *Washington Post*.

Snyder, A. R., McLaughlin, D. K., & Findeis, J. (2006). Household composition and poverty among female-headed households with children: Differences by race and residence. *Rural Sociology, 71*(4), 597–624.

Stebbing, A., & Spies-Butcher, B. (2016). The decline of a homeownership society? Asset-based welfare, retirement and intergenerational equity in Australia. *Housing Studies, 31*(2), 190–207.

Sturgeon, J. A., Arewasikporn, A., Okun, M. A., Davis, M. C., Ong, A. D., & Zautra, A. J. (2016). The psychosocial context of financial stress: Implications for inflammation and psychological health. *Psychosomatic Medicine, 78*(2), 134–143.

Taylor, M., Stevens, G., Agbo, K., & Raphael, B. (2017). The impacts of household financial stress, resilience, social support, and other adversities on the psychological distress of Western Sydney parents. *International Journal of Population Research, 1–12, 2017* (Article ID 6310683).

Thredgold, C., Beer, A., Zufferey, C., Peters, A., & Spinney, A. (2019). An effective homelessness services system for older Australians *Australian housing and urban research institute, final report No. 322*. Melbourne: Australian Housing and Urban Research Institute.

Varley, A. (1993). Gender and housing: The provision of accommodation for young adults in three Mexican cities. *Habitat International, 17*(4), 13–30.

Warren, D. (2006). *Aspects of retirement for older women*. Canberra: Australian Government Office for Women.

Wells, N. M., & Harris, J. D. (2007). Housing quality, psychological distress, and the mediating role of social withdrawal: A longitudinal study of low-income women. *Journal of Environmental Psychology, 27*(1), 69–78.

White, N. D., Packard, K. A., Flecky, K. A., Kalkowski, J. C., Furze, J. A., Ryan-Haddad, A. M., Black, L. L., Rusch, I. M., & Qi, Y. (2018). Two year sustainability of the effect of a financial education program on the health and wellbeing of single, low-income women. *Journal of Financial Counselling and Planning, 29*(1), 68–74.

Wizard Home Loans. (2009). *Emerging trends in women’s home ownership*. Melbourne: *Wizard Home Loans*.

Wood, G. A., Smith, S. J., Cigdem, M., & Ong, R. (2017). Life on the edge: A re-analysis of gender, homeownership and urban regeneration intervention. *Melbourne: Australian Housing and Urban Research Institute*.