How Home Modifications Impact Ageing Well at Home: Supporting a Lasting Housing Legacy

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ABSTRACT

A lasting legacy of all Olympic and Commonwealth games is their athletes villages. This paper discusses the potential for home modifications to support the process of ageing well that builds on this housing legacy and as such points to the benefits to be gained from both wider uptake of universal design in housing plus attention to special adaptations as needed. In the context of Australia’s ageing population, ageing well can encompass a number of different housing and care models, however common to all of these is a drive to maintain quality of life levels. There is evidence to suggest that home modifications impact recipients in a number of overlapping ways, by increasing independence within the home, increasing social participation and enabling people to remain in their own homes for longer as they age. This paper refers to completed stage one findings (Levels 1, 2 and 3) of an ongoing research project investigating the value of home modifications. It uses a mixed method approach and thematic analysis of survey responses from home modification recipients (n=157). This research design enables the measurement of the impact of home modifications to housing and resulting changes to care giving needs. The survey results reveal a decrease in reported care hours needed following home modifications, a trend which is further supported by the thematic analysis. In conclusion, the research contributes to developing evidence that home modifications can have a measurable impact on the care needs of recipients and support the changing social needs of ageing populations in ageing well.

Keywords

Home modifications; older people; accessibility.

INTRODUCTION

The incorporation and attention to innovative and attractive universally designed housing has been a significant and lasting legacy of all major infrastructure projects undertaken to support International games collaboration. Housing plays an important role in maintaining the health and well-being of populations, and universally designed and specially modified housing is particularly important for older people and those living with a disability regardless of nationality. For instance, the advent of large capital infrastructure projects like Olympic games brings with it hard-core science, innovation and technical creativity and leaves behind
the lasting gift of homes that are greener and easier to maintain. The Sydney Olympics were the first Olympics to attend to Universal Design in housing by application of the Australian Adaptable Design criteria to Newington Games Village\(^1\). However, no matter how innovative universally designed homes are many will still require adaptations to house those with specific functional limitations and this is where the marriage of universal design and home modification interventions are important.

An approach to innovative housing solutions that considers demographic change in the context of local community needs and requirements is likely to leave the best long term legacy to its residents. The application of Universal Design Principles to new housing design is one way of ensuring the whole-of life accessibility of a person’s home, however a majority of housing has been designed and constructed without consideration of Universal Design Principles. Home modifications apply Universal Design Principles to existing housing when health changes make the accessibility of the home environment critical for everyday living.

Opportunities to assess approaches to housing come into focus as counties prepare for upcoming Olympic Games. Olympics and Commonwealth games preparation continues to be associated with the physical regeneration of cities (Smith and Fox, 2007) as preparation involves greater investment in capital, and housing is a critical aspect. As Japan approaches the Tokyo 2020 Olympic and Paralympic Games this study plays a role in unpacking the importance of universal design principles in housing, including how the application of universal design principles to housing impacts wellbeing, independence and need for caregiving in communities considered vulnerable to unmet care needs, such as older people. This study focuses on the impact of home modifications as a way of measuring the impact of incremental application of universal design principles on housing.

The relationship between home modifications and universal design can be understood by examining their independent definitions. Firstly, Universal Design is defined as “the design of products and environments to be usable by all people to the greatest extent possible, without the need for adaptation or specialised design” (Steinfeld and Maisel, 2010). When a home has not been designed using universal design principles, usability of the environment can become compromised, particularly for people who find themselves unwell, with a permanent disability or with declining mobility due to ageing processes. Home modifications are an important housing intervention where a predominance of housing is older and inaccessible, and the population is ageing. New housing designed to universal design principles can reduce the need for home modifications, however individualised needs of people as their health changes mean that home modifications cannot be eliminated altogether. Universally designed housing can work in tandem with home modifications, by making home modifications feasible and more affordable; for instance, reinforced walls make installation of additional shelving and grab/hand rails possible.

Home modifications are defined as;

“..Changes made to the home environment to help people to be more independent and safe in their own home and reduce any risk of injury to their carers and care workers. Modifications to the home include changes to the structure of the dwelling e.g. widening doors, adding ramps, providing better accessibility etc. and the installation of assistive devices inside or outside the dwellings e.g. grab rails, handrails, lifts etc.”\(^2\).


Home modifications are services that can be administered as part of the Australian Government funded community care, or they can be privately organised and funded by individual homeowners. The research referred to in this paper relates to government funded and administered home modifications. Home modifications can be considered the application universal design principles in the limited setting of existing homes. The study of home modifications and how they impact health and caregiving provides insight into how universally designed built environments can better support ageing populations to age well in their own home.

"Ageing well" is a concept that refers to diverse dimensions of wellbeing, health, social and economic factors and common to all of these is a drive to maintain quality of life levels. International research supports a relatively consistent view that physical health, independence and social relationships are the three most important factors impacting older people’s wellbeing and the process of ageing well (Hsu, 2007, Bowling, 2007, Fernández-Ballesteros et al., 2010). Modifying an older, existing dwelling using universal design principles, can help to maintain a person’s independence (Lansley et al., 2004) by reducing physical functioning decline (Liu and Lapane, 2009), and reducing the need for care (Fox, 1995, Allen et al., 2006, Anderson and Wiener, 2013). Home modifications also have the potential to improve wellbeing (Oswald et al., 2007) and social participation (Vik et al., 2007). Therefore as an application of universal design principles, home modifications have potential as a support of ageing well practices of older populations by impacting independence, wellbeing and social participation.

Research underpinning this paper is currently being conducted in Australia and investigates the impact of home modifications (government subsidised) as perceived by the recipients themselves. This paper explores how need for care is impacted by home modifications and unpacks the recipients’ experiences and outcomes. The study results indicate that home modifications can measurably reduce caregiving needs and impact recipients by providing security and confidence to older people with declining health irrespective of their care needs, restoring lost independence and social participation.

METHOD

By analysing recipient experiences of home modifications and caregiving, this paper explores the ways and extent to which home modifications, can support universally designed housing, can contribute to ageing well. This paper is based on findings from research conducted by the primary author for a PhD thesis and incorporates new data (n: 157) previously uncaptured as part of the study referred to in (Carnemolla and Bridge, 2014). The research is exploratory and is intended to analyse how home modification outcomes can be valued in the context of community care provision models.

This paper applies a mixed method approach via the following analyses:

i) Quantitative analysis of formal and informal care hours both before and after home modifications from self-reported data

ii) Qualitative analysis in the form of thematic analysis of comments provided by the research sample about their experiences of home modifications

Surveys were distributed to recent recipients of home modifications via two Home Modification Service Providers in NSW as part of Home and Community Care (HACC) supported service provision. Consequently, all respondents are HACC clients who include frail older people and younger people living with a disability. To be eligible for HACC services, including home modifications, clients must have a moderate, severe or profound disability or be caring for someone with the disability. The Home Modification Service
provision model provided by HACC organises the management, allocation, contracting and provision of home modification services.

**Surveys sought self-reported changes to caregiving received both before and after home modifications.** This was reported as hours of informal and formal care, both before and after home modifications. The ability to compare hours of care required before home modification with hours of care after home modification builds enables commentary to be made about changes to relative independence of home modification recipients.

Following the quantitative analysis of the care data, a qualitative approach in the form of thematic analysis was employed using responses to open ended survey questions. Respondents were asked to comment on how home modification changed their health and care needs. This thematic analysis serves both to further explore the impact of home modifications and to support the quantitative findings.

There are a number of limitations of the research design which can be attributed to time and budget constraints as well as ethical considerations. Control data was not included in the research design due to ethical considerations as home modification interventions could not be ethically withheld from those eligible for them. The research design did not have the time capacity to survey recipients longitudinally i.e. before home modifications. Thus data on experiences before and after home modification were captured in a single survey at a single point in time – between one-six months after home modifications were installed. The survey therefore asked recipients to recall their care hours received before home modification as well as report on their current care received. It is acknowledged that recall bias may contribute to a level of error in results and also that self-selection bias may impact the overall results.

**RESULTS**

The results are documented in two sections; firstly the quantitative analysis of the care data followed by the thematic analysis of the qualitative data.

**Quantitative Analysis**

The survey asked respondents to document their hours of care received before home modifications and after home modifications. Care was divided into two types, informal (unpaid) care provided by family and/or friends and formal (paid) care as provided by HACC services. Figure 1 provides a comparison of each care type in the form of average weekly hours provided both before home modifications and after home modifications.
Analysis of the average weekly care data in Figure 1 reveals that installation of home modifications resulted in a reduction in the levels of both formal and informal care received.

Qualitative Analysis

The qualitative analysis of survey responses provides the ability to unpack how home modifications are impacting the health and care needs of recipients. Data was collected about individual experiences of home modifications in the form of an open ended question in the survey; “How have home modifications changed [the respondent’s] health and care needs? Analysis of the individual comments made by respondents (n: 157) reveals six key themes in the respondents’ experience of home modifications as documented in Figure 2 below.

Figure 2: Six key themes of home modification outcomes as reported by home modification recipients in order of prevalence in the data.
Using Nvivo software, the qualitative responses in the survey were coded by conventional content analysis approach (Hsieh and Shannon, 2005). Using a process of inductive category development, (Mayring, 2004) the six most prevalent themes are revealed in Figure 2 above. These are listed in order of decreasing occurrence with the theme of increased safety and confidence being the most prevalent in the data. The outcomes of home modifications identified in the themes are not measured, however this part of the study is significant because it enables better understanding of the nature of recipient’s experiences of home modifications and the nuances of wellbeing, independence and living at home despite physical limitations. Examples of actual responses are listed in Table 1.

Table 1: Examples of respondent’s experience of home modifications organised in themes

<table>
<thead>
<tr>
<th>Key theme</th>
<th>Frequency (n:157)</th>
<th>Examples of responses</th>
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<tbody>
<tr>
<td>Increased feelings of Safety/ confidence in the home</td>
<td>65.0%</td>
<td>“I have had two falls this year. The grab rail in the shower helps me feel more secure. Rails at front steps and ramp to clothes line mean I have less risk of falling again.” Respondent 9</td>
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<td>“I feel more secure showering or taking a bath because if I feel dizzy there is something to hold on to.” Respondent 12</td>
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<td>“I was fearful of stepping over the bath to shower. I always bumped my left leg. I love my bathroom it’s so easy to have a shower – it is the best room in the house now.” Respondent 99</td>
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<td>“I was fearful of tripping on the shower hob. The modifications are wonderful I am much happier and feel safer. Respondent 155</td>
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<td>Increased mobility throughout home</td>
<td>43.9%</td>
<td>“Grab rails help with getting up steps back and front doors.” Respondent 64</td>
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<td>“The installation of the hand rail at the back steps has made a great difference to my everyday tasks.” Respondent 2</td>
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<td>The bathroom modifications have made it easier for me to move about the bathroom in a safer environment. The same with external modifications of ramps and railings.” Respondent 14</td>
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<td>Increased independence</td>
<td>19.7%</td>
<td>“My son helps me where he can. It is much easier for me now to take care of myself in the bathroom.” Respondent 109</td>
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<td>“I can now look after myself totally at home and don’t need mum and dad to help me.” Respondent 121</td>
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<td>“The larger bathroom toilet has helped my ability to shower and toilet by myself immeasurably.” Respondent 133</td>
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<td>Supports caregiving</td>
<td>17.2%</td>
<td>The modification has helped a lot for my husband since he got MND. It is a lot easier to shower him and for the carers. Respondent 134</td>
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<td>I have benefited greatly by the bathroom modifications. Especially for my handicapped son. It has made it so much easier to shower him. Before he had to be helped in and out of the tub. I no longer have to shower over the drain. Respondent 131</td>
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<td>I have Parkinson’s and my wife has dementia. The modifications have made me independent and made it easier for my daughter to care for us. Respondent 119</td>
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<td></td>
<td>This modification has allowed my wife to shower me and get me dressed much more easily each day. Respondent 106</td>
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<tr>
<td>Social participation</td>
<td>10.8%</td>
<td>I can now get to the garage. I can work in my workshop and get into the car easily. [It has] improved my ability to participate in my life more.…and it helps my wife enormously. Respondent 120</td>
</tr>
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Oral presentation
Examples of responses

"Since I have had my ramp I am able to walk about outside the house with my walker. I have improved in health and feel happier." Respondent 68

"Things are easier at home. For the first time in 4 years I have been to the movies." Respondent 12

Enables people to return home after hospitalisation

3.1% "I have been in hospital for many months during which time the home mods were carried out. Without them I could not live at home. I owe my dignity to them." Respondent 130

"I couldn't move home without the modifications." Respondent 147

The strongest themes were ‘Increase safety/confidence’ and ‘Improved mobility throughout home’ followed by ‘Increased independence’, ‘Supporting caregiving role’, ‘increased social participation’ and ‘enabling return home’. These themes can be considered nuances of quality of life, and are in alignment with what are considered globally the three most important factors impacting older people's wellbeing; physical health, independence and social relationships (Hsu, 2007, Bowling, 2007, Fernández-Ballesteros et al., 2010). The thematic analysis supports the quantitative findings obtained from self-reported care hours before and after home modifications by improving the ability to perform tasks more easily, safely and independently.

DISCUSSION

The results reveal a significant reduction in care hours following home modifications and suggest the ability for home modifications to support self-care practices. Differences in the extent of reduction of hours between informal and formal care, which include 47% reduction in informal care and 17% reduction in formal care, may be due to the ability of informal care to respond quickly to changes in need, while formal care will be less responsive to changing needs due to administration requirements. Another reason formal care may be less responsive is that recipients may be reluctant to go through the process of officially reducing their formal care needs, particularly if needs were previously unmet.

Unmet need for care services has been identified in a number of studies of care services throughout the world including United States (Li et al., 2012, Desai et al., 2001), European Union (Jiménez-Martin and Sánchez, 2012), Japan (Kono et al., 2012, Okuyama et al., 2009), Australia (Commonwealth of Australia, 2012) and the People's Republic of China (Arnsberger et al., 2000) with implications for care giver burden and quality of life. It is possible that one of the more significant roles that home modifications will play, as many countries begin to experience the collective consequences of ageing populations, will be in mediating some of the unmet need identified in these studies as a cause for concern in ageing populations throughout the world (Williams et al., 1997).

The ability for home modifications to substitute for caregiving, identified in the reduction in care received after home modification in this study, directly implicates home modifications as an intervention with potential to mediate unmet need. The thematic findings in the qualitative responses indicate further that home modifications have an integral role to play in supporting processes of ageing well at home. The thematic analysis of survey comments unpacks other home modification outcomes which are all nuances of ageing well, and support the growing body of evidence of home modifications.
The results of this study suggest that Home modifications have the potential to support levels of care burden which are a result of ageing populations, as well as provide support to the practice of caregiving, both formal and informal. As we consider not only the personal needs of the individual person, but the collective housing needs of ageing populations, Universal design principles, supported by home modifications become an important consideration of housing models designed to meet the visions and expectations of a world class legacy of a mega sports event like an Olympic Games.

CONCLUSION

As the impact of the legacy of an Olympic Games is recognised as a critical part of the long term vision and rejuvenation of a city (Leopkey and Parent, 2012), there are lessons to be learnt about long term and sustainable housing solutions in the preparation for Japan’s 2020 Olympic city, Tokyo. This study reveals the importance of universal design principles in providing long term beneficial solutions to housing for communities, particular with ageing populations and begins to explore by measuring the complex interactions between housing and health of a population. Home modifications provide a unique opportunity to measure how incremental changes to housing can create measurable outcomes for recipients. This study reveals that the application of home modifications results in reduced need for caregiving. Informal care was most sensitive to home modification, being reduced by 47% after home modifications. Formal care was less sensitive with a 17% reduction in average weekly care hours after home modifications.

This study also reveals broader impacts of home modifications using qualitative processes. The ability for home modifications to increase feelings of safety and confidence in the home was the strongest theme in the qualitative results and indicate the role home modifications might play in preventing falls in the home for older people. The themes of increased independence, increased mobility throughout the home and supporting caregiving were also detected and further support the quantitative findings that home modifications reduce the need for care by improving the ability for a person to self-care. The theme of increased social participation was also revealed in the qualitative part of the study. The social aspect of health and wellbeing is increasingly identified as an important contributor to overall health as a more integrative model of health is recognised globally (Bircher and Kuruvilla, 2014) and this role of home modifications warrants further study, measurement and analysis.

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REFERENCES


