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Energy poverty, housing and health: the lived experience of older low-income Australians

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ABSTRACT

Energy poverty (EP) is the product of three main factors – the cost of energy, household income and the energy efficiency of the dwelling. Climate change and rising energy costs are likely to accentuate EP. This study extends our knowledge about EP in Australia and examines its relationship to housing and health. Drawing on 23 semi-structured interviews, we map the impacts of EP on older low-income people residing in Sydney and Melbourne. These impacts include food insecurity, an incapacity to purchase essential consumer items, an inability to afford required medical procedures, thermal discomfort and social exclusion. We found that many interviewees do not recognize their own EP situation or are too ashamed to ask for help. Thus, the overall cost of EP to individuals and the broader society can be far higher than what statistics indicate. The article proposes a conceptualization of the relationship between housing, health and EP drawing on a figure we have created. The severe impacts of EP suggest that measures to lessen it among older vulnerable households are urgently required.

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KEYWORDS
Energy poverty; housing conditions; mental and physical health; older people; social isolation

Introduction

Energy poverty (EP) is a concern for millions of people globally and one of the central challenges of the contemporary period (Che et al., 2021; Papada & Kaliampakos, 2018). In 2015, ensuring universal access to affordable, reliable, sustainable and modern energy became one of the 17 United Nation's Sustainable Development Goals (United Nations, 2021). Although what it means to be in EP is contested, it can be broadly defined as a household's inability to secure or afford an acceptable level of energy services (electricity, gas and other fuel sources) in the home (Bouzarovski & Petrova, 2015; Culver, 2017; Simcock et al., 2017). In Australia, the setting for this article, EP is a major issue for many low-income households (Chai et al., 2021; Churchill & Smyth, 2021; KPMG, 2017). A recent survey based on a representative sample of 1000 people, found that electricity remains the primary cost of living concern for Australian households. It was ranked above private health, mortgages and food and groceries, (ACOSS, PCA & EEC, 2018). A study in 2016, estimated that low-income households (defined as households in the bottom 40% of Australia's income distribution) spent 12.4% of their weekly income on utility bills and fuel, whereas high-income households spent 2.9% (BCEC 2016). During the COVID-19 pandemic, household energy debt increased by 21% to $AU124 million between March and November 2020 (Curtis, 2020). At the beginning of March 2021, the Australian Energy Regulator (AEG) concluded that 130,000 electricity customers were in debt and the average debt was $AU1,151 (AEG, 2021).

A particularly vulnerable group are older people (over 65 years of age) who are reliant solely on the government Age Pension for their income. The weekly government Age Pension in March 2021 for a person living by themselves was $476. The Melbourne Institute's well-recognized poverty line for a single person (not in the workforce) in December 2020 was $465 a week, including housing (Melbourne Institute, 2021). According to the annual Household, Income and Labour Dynamics Survey (HILDA) survey, poverty rates among older single people and older couples have been consistently higher than any other household type (Wilkins et al., 2020). An Australian study estimated more than one-third of households identified as energy-poor have a reference person aged 65 years or above (Azpitarte et al., 2015). In June 2020, 4.188 million people, 16.3% of Australia's population, were aged 65 years and over (ABS, 2020).

Research on EP and older people has historically focused mainly on patterns of mortality and morbidity

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(Rudge & Gilchrist, 2005; Wilkinson et al., 2004). More recently, studies have focused on older people's lived experience of EP and their coping mechanisms (Chard & Walker, 2016; Willand et al., 2017). This study aims to expand our knowledge of the impacts of EP on older Australians who are solely or primarily reliant on the government Age Pension for their income. Drawing on 23 in-depth semi-structured interviews with older Australians in Sydney and Melbourne, we examine how EP impacts on their everyday lives, health and wellbeing.

Housing, older people and energy poverty in Australia

In Australia, there is a strong preference among older people to age in their own home (Judd et al., 2014). A consequence is that many older Australians are living in old homes that are not energy efficient (Romanach et al., 2017). In Australia, the Nationwide House Energy Rating Scheme (NatHERS) assessments are the most common way to meet the minimum energy efficiency requirements of the National Construction Code. Ratings range from 0 to 10 Stars (Department of Industry, Science, Energy and Resources, 2021). A 0-star rating means that the building envelope does little to reduce the discomfort caused by hot or cold temperatures. At present, a 6-star rating is the minimum standard for new homes in Australia and indicates good, but not outstanding, thermal performance. A 10-star rated home may require very little or no artificial cooling or heating to keep occupants comfortable (DEE, 2019). The Australian Housing Conditions Dataset (AHCD) which is based on a sample of 4501 households, including 1999 households with a household head aged 65 or over, found that 78% of homes of older Australians were 25 years old or more. Minimum energy efficiency standards for residential property were only mandated in the Building Code of Australia in 2006. This is significant, as studies indicate that much of the housing stock built before 2006, has a star rating of two or less (Berry & Marker, 2015; Sustainability Victoria, 2014; Willand et al., 2019). The poor energy efficiency of homes is potentially a serious issue, especially for older people reliant on the government Age Pension. The homes concerned are difficult to heat or cool adequately and are a challenge for older people who are less tolerant of extreme temperatures (van Hoof et al., 2017).

The lack of thermal comfort represents a health risk for older people (Dear & McMichael, 2011; Howden-Chapman et al., 2012), The risk has been accentuated by climate change. In 2018/2019, New South Wales, the state where Sydney is located, experienced the hottest summer on record – 3.41 degrees Celsius above the average (Climate Council, 2020). On the 4th of January 2020, Penrith in outer Sydney recorded the hottest day ever in the Sydney region – 48.9 degrees Celsius (Australian Government, 2021). The average maximum daytime summer temperature in Sydney is 26 degrees. Melbourne in Victoria is located on the southern end of the country. On the 31 January 2020, Laverton in Melbourne outer suburbs recorded a temperature of 44.1 degrees Celsius. The average summer temperature in Melbourne is 26 degrees Celsius. In terms of climate zones, Sydney is located in Zone 5 Warm Temperate, and Melbourne is in Zone 6 Mild Temperate (ABCB, 2021). As such, Melbourne buildings typically require heating for longer periods of the year than Sydney. Both zones can experience periods of extreme heat. In buildings with poor thermal design and performance, extreme heat makes the dwelling very uncomfortable. Mechanical cooling is required to make the environment tolerable. This adds to energy costs. One response is to cut down on energy use and endeavour to cope with the consequences of high internal temperatures (Sherriff et al., 2019; Thomson et al., 2019). Australian air conditioning providers recommend a standard air conditioner's temperature should be set to 25–27 degrees for cooling in summer (Canstar Blue, 2021). Clearly, to achieve temperatures in the comfortable 25–27 degrees Celsius range, home occupiers would need to use air conditioning extensively.

Within the older cohort, there is also a significant gender factor with respect to EP. Although EP is generally presented as gender neutral, its impact is often uneven (O'Neill et al., 2006; Robinson, 2019). In Australia, like many other advanced economies, older women are more likely to suffer from entrenched poverty and experience EP as a result (Robinson, 2019; Wilkins et al., 2020).

The impacts of energy poverty

Energy poverty has a range of impacts and older people, especially if they have health issues and limited income, are particularly vulnerable. The most concerning impacts are food insecurity, inability to purchase essential items, poor health due to thermal discomfort and social exclusion.

The definition of food security, agreed to at the World Food Summit in 1996, refers to 'a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritional food that meets their dietary needs and food preferences for an active and health life' (World Food Summit,

1996). There is increasing evidence that in advanced economies money spent on energy bills is contributing to food insecurity (Hernández, 2016; Kearns et al., 2019). After paying their energy bills, some people do not have the ability to purchase an adequate supply of nutritious food (see Tuttle & Beatty, 2017). In advanced economies, this is especially the case for those private renters who are dependent on government benefits for their income. High accommodation costs, in combination with energy costs, places them in a particularly vulnerable position (see Morris, 2016). Besides food, their high energy costs can also result in an inability to purchase other essentials such as prescription medicines (Nord & Kantor, 2006).

A comparative study conducted by Thomson et al. (2017) found that in most European countries, the energy-poor population is statistically more likely to report poorer physical and mental health than the non-energy poor population. To avoid the burden of high energy bills and avoid or lessen EP, many low-income households reduce their energy use (Judson et al., 2019; Roberts & Henwood, 2019). This can result in thermal discomfort and impact on the health of the household (Hernández & Siegel, 2019). The relationship between excess winter deaths (EWD), low thermal efficiency of housing and low indoor temperature during cold weather is well-established (Anderson et al., 2012; Day & Hitchings, 2011; Hamza & Gilroy, 2011).

Heatwaves and an inability to cool the home adequately are also a major health risk. It has been argued that in Australia, in the last couple of decades, wildfires and heatwaves have been responsible for over 60% of deaths related to natural hazards (Borchers Arriagada et al., 2020). People experiencing EP are more prone to suffer during heatwaves, as they cannot afford the cooling required to feel comfortable at home (Nicholls et al., 2017; Nicholls & Strengers, 2018). In both Melbourne and Sydney, cooling is required from November to the end of February. Physical fragility increases with advancing age and reduces people's ability to keep cool or warm and maintain their health temperature events (Steffen et al., 2014). For older people who may be frail, maintaining thermal comfort is a major challenge.

Social isolation is another possible outcome of EP. If a person's expenditure on energy consumes a substantial proportion of their disposable income, it makes it difficult for them to partake in social activities (Chester, 2013; COTA Federation, 2018). They simply do not have the requisite funds (Morris, 2012). Also, some households may not have visitors because their home is thermally uncomfortable or they fear it will increase their energy use (Kearns et al., 2019; Middlemiss et al., 2019).

Methodology

An inductive approach using semi-structured in-depth interviews was adopted to obtain an understanding of how older Australians use energy and are impacted by EP. The interview guide was designed around six main topics - background and housing characteristics; use of energy at home and strategies to reduce energy consumption; the impacts of the home on energy usage; difficulties in paying the energy bill; impacts of the energy costs; and awareness of energy hardship programmes and assistance.

Just before the COVID-19 pandemic and resultant lockdowns, community centres and relevant Seniors events were visited to publicize the research and recruit interviewees. However, recruitment was severely disrupted by the COVID pandemic, as social distancing and self-isolating measures meant community centres were closed and offline advertising was not possible. In response, contact was made with relevant organizations that advocate for older Australians and/or provide assistance with energy hardship. The organizations approached to provide support included the Combined Pensioners and Superannuants Association, the Public Interest Advisory Centre (PIAC), the NSW Council of Social Services (NCOSS) and the Council on the Ageing (COTA). They all agreed to advertise the study through their networks and publications. In addition, a couple of older people who had participated in an earlier study by one of the authors were contacted and agreed to participate.

The sensitivity of the interviews meant that interviewees were given every chance to stop the interview at any point. It was made clear that they did not have to answer a question if they felt it was too challenging. The information sheet that was given to interviewees provided details as to where counselling could be obtained if required. All interviews conducted were in accordance with the ethical standards of the UTS Human Research Ethics Committee (Approval Reference No. ETH19-4018) and with the Helsinki Declaration of 1964 and its later amendments. Informed consent was obtained from all of the interviewees.

Over the course of 2020, 23 low-income older Australians were interviewed (see Table 1) of whom 17 were solely or primarily reliant on the government Age Pension for their income. The focus was on older Australians, however, there were five outliers of which three were in the fifties and two were in their early sixties. Of the five outliers, two were reliant on their own minimal savings, one on the unemployment benefit and two were dependent on the Disability Support Pension (a government benefit) for their income.

Table 1. Profile of interviewees.[a]

Pseudonym	Location in Sydney	Gender	Age	Household Composition	Main Income Source	Source of Energy	Housing Tenure
Bill	Inner ring	M	70	Single	Age pension	Electricity	Social housing
Gloria	Inner ring	F	70	Single	Age pension	Electricity	Social housing
Charles	Inner ring	M	70	Couple	Age pension	Electricity and gas	Social housing
Lauren	Middle ring	F	87	Single	Age pension	Electricity and gas	Homeowner
Iris	Inner ring	F	77	Single	Age pension	Electricity	Affordable rent
Mary	Middle ring	F	70+	Single	Age pension	Electricity and gas	Homeowner
Megan	Inner ring	F	93	Single	Savings	Electricity and gas	Homeowner
Adam	Middle ring	M	63	Family with child	Wages and salaries	Electricity and gas	Homeowner
Sonia	Outer ring	F	74	Single	Age pension	Electricity	Private renter
Anna	Not fixed	F	51	Single	Disability pension	Electricity and gas	Private renter
Amelia	Inner ring	F	70	Single	Age pension	Electricity and gas	Social housing
Phoebe	Middle ring	F	71	Single	Age pension	Electricity	Homeowner
Samantha	Inner ring	F	77	Single	Age pension	Electricity	Social housing
Janine	Inner ring	F	64	Single	Savings	Electricity and gas	Social housing
Denise	Outer ring	F	77	Single	Age pension	Electricity	Social housing
Chloe	Outer ring	F	70	Single	Age pension	Electricity	Affordable rent
Marisa	Outer ring	F	70	Single	Age pension	Electricity	Affordable rent
Rose	Outer ring	F	65	Single	Age pension	Electricity	Affordable rent
Daniel	Outer ring	M	53	Single	Disability pension	Electricity	Social housing
Violet	Melbourne	F	67	Single	Age pension	Electricity and gas	Social housing
Jessica	Melbourne	F	65	Single	Age pension	Electricity and gas	Social housing
Jasmine	Melbourne	F	53	Single	Unemployment benefit	Electricity	Social housing
Anthony	Outer ring	M	69	Single	Savings	Electricity	Homeowner

[a]All the names used are pseudonyms.

We decided to include these interviewees due to them being in a very similar position to the interviewees on the Age Pension with respect to income and frailty. Noteworthy is that 18 of the 23 interviewees were female.

To analyse the data, we conducted a thematic analysis of the interviews. The process started with transcribing verbatim the audio recordings into text and isolating relevant themes. The transcripts were then loaded into NVivo. NVivo facilitated the organization of the transcripts into themes. For this article, we focused on the following themes: EP's impact on food insecurity, consumption of essential consumer items, medical expenses, capacity to maintain thermal comfort and social exclusion.

Findings and discussion

Energy poverty and food insecurity

As indicated there is evidence from previous research (Hernández & Siegel, 2019; O'Neill et al., 2006) that EP has the potential to contribute to food insecurity. The interviews indicated that, for several interviewees, prioritizing paying their energy bill meant that they compromised on their food consumption. Sonia (74 years old, private renter) was in a particularly difficult position. Not only was she totally reliant on the government Age Pension for her income, but she was also a private renter. This meant that unlike older social housing tenants whose rent is set at a maximum of 25% of their income, Sonia had to pay a market rent. In Sydney at the end of 2019, the median weekly rent was $525 for houses and $510 for apartments. In contrast, the rent for social housing tenants, calculated at 25% of income, was around $119. After paying her rent (she had managed to find an apartment for $290 a week) and energy bill, approximately $50 a week, Sonia had little money left over for food:

> And [I had] to agree for a payment plan for that one [overdue bill]. But my payment plan [for electricity] has always been self-organised at $50 a fortnight. But it did leave me with not that much left over [for] food and stuff. It was a regular drain on my income … It effects the amount I'll have left to eat with. And I know that my electricity bill is manageable if I don't eat too much. (Sonia)

When asked whether her energy costs had an impact on her ability to purchase essential items, Jessica (65 years old, a social housing tenant) lamented that she was forced to buy 'cheaper food'.

> I have to admit, you buy cheaper things for food, the cheaper quality, rather than the better quality because it's cheaper. You can buy that [the cheaper food] rather than the dear stuff because you can get more.

Jasmine (53 years old, social housing tenant) was reliant on the government unemployment benefit for her income. The unemployment benefit (Jobseeker) is much lower than the Age Pension; in July 2021 it was $310.40 a week. Jasmine was struggling to pay her energy bill, she owed her electricity provider close to $500, and was forced to rely on charities for most of her food requirements:

> I go to food banks and then I might go to three or four food banks … A lot of the stuff from the food banks are mainly out of date and they are just rubbish … And I try and save that way. It's a lot of work to kind of go like that and then you get confused [as to] which ones you've been to … (Jasmine)

She felt her diet was not nutritious and had resulted in her putting on weight. This in turn contributed to her being depressed and isolated which pushed up her energy bill:

> I live on bread and baked beans, or spaghetti, or something like that … All it does is make you put on more weight. It makes you more depressed and then you stay home more, and you use more heater or cooling because you don't want to go out … You don't get no meat or nothing. You just get like tins of baked beans and some frozen stuff sometimes and out of date food. I mean, I shouldn't be ungrateful, but I just throw it out. It's disgusting, you know. You just get so angry, you know if I am eating food that is out of date by a month of something, you know what I mean … terrible. (Jasmine)

There is the possibility that the out of date food was still edible, but Jasmine was not prepared to risk it.

Violet (67 years old, social housing tenant) also felt that her high energy bills were compromising her health. She was unable to buy enough nutritional food:

> You can't shop properly and then your health goes down the plug, you know. If you go to shops, you see the chips and the lollies and that. They are cheaper and the people are buying those because they can't afford to buy broccoli … So you know, what do you do first? You feed yourself, put the heater on and hope that it's [the energy bill] not going to be too high. It's very, very hard … Sometimes I just, you don't know what to do first. So, I opt to pay my bills and pay my rent first and whatever is left over, then I see where I am and how I am, and what I can afford I buy, and what I can't afford doesn't get bought. That's all there is to it.

Energy poverty and its impact on the consumption of essentials besides food

High energy bills contributed to other essentials such as clothing and hygiene products being out of reach. Jasmine restricted her use of basic items like shampoo and deodorant:

> Oh no, I can't just buy what I want. No, it does stop you from buying certain things. No, I can't do that. You know, like, a lot of personal hygiene stuff. You can't just go and get [them]. Like, say a body wash. I'd buy a body wash, but I might not buy shampoo. So I use the body wash to wash my hair. You know what I mean, instead … And If I don't go out, I don't use deodorant … (Jasmine)

Violet spoke about how her high energy bill contributed to her not being able to purchase basic clothing items.

> It [her energy bill] prevents you [from buying essentials] because it [the bill] goes so high, you can't afford to eat properly, can't afford to go buy underwear or can't buy a blouse. You can't afford to get any of those things. There is not enough money in the budget … I don't have a bra … I can't afford to buy one. There is no money in the budget for that.

Daniel (53 years old, social housing tenant) also found it difficult to purchase clothes:

> I mean a couple of extra dollars a fortnight probably won't matter too much to anyone, but yeah, I mean over a year or something, it may be $100 total or something and that can be used for other things. It might be to, you know, buy some clothes or to buy a new pair of sneakers or something like that. It's better for the older person who is on a limited income, you know, if they can use that money for those sorts of things, instead of paying for the electricity.

As elaborated on below, the inability to purchase basic items probably contributed to depression and social exclusion (Baudaux et al., 2019).

Energy poverty and medical expenses

In some cases, the limited disposable income of interviewees meant they could not obtain the proper medical care and or medication they required. Medicare in Australia covers most medical costs, but there are important omissions. For example, most dental treatments, physiotherapy, podiatry, glasses and contact lens are not covered or coverage is limited. Also, many specialists do not bulk bill which means that patients have to pay 'the gap'. The gap refers to what they pay for their treatment and what they get back from the government (Medicare). If a specialist bulk bills there is no gap and the treatment is essentially free. These gaps give greater urgency to Sheriff et al.'s (2020) argument that we need an innovative and integrated approach to identifying and assisting people whose health is compromised by living in EP. Daniel (53 years old, social housing tenant) had been referred to medical specialists but could not afford to see them. He felt that his energy bills were a factor:

> Like I have some specialist referrals that I haven't been able to afford to go and see because of the cost of those. And if I had solar power and had an almost zero electricity cost, then I could certainly use that money towards the medical bills, yeah.

At the time of the interview, Amelia (70 years old, social housing tenant) had recently seen an eye specialist. This expenditure meant that she was now worried that she

would be unable to pay her energy bill: 'If I have an unusual expense, for example I had to go to an eye specialist recently, and that was an unusual expense. And so, if I have unusual expenses, it puts me behind [on the energy bill].'

Rose (65 years old, social housing tenant) knew she needed an MRI (MRIs are not covered by Medicare) as soon as possible, but could not afford the procedure. She was worried that if she went for an MRI she would not be able to pay her energy bill and other bills.

> I am a bit scared at the moment because I should be getting an MRI this year, but I don't have the money to pay for that, you know what I'm saying. What [if] another bill comes and I realise that, you know, that's not enough? (Rose)

When asked if her energy bills affected her quality of life, Lauren (87 years old, homeowner) mentioned that despite being a homeowner and thus low housing costs, she had had to cut back on the physiotherapy sessions she required:

> Ah, look, I have the physio bills, for example, that are not covered [by Medicare], so well I have to pay for them. They [the government's scheme] give you five treatments a year … but [for my condition] it adds up to 24 [sessions] a year, so I pay for 19 that are not covered [by Medicare]. But what I've been doing is, instead of going twice a month, I go only once a month.

The health conditions of some interviewees required treatments that increased energy usage. However, they restricted their treatments due to concerns that their energy bill would increase significantly (see Snell et al., 2015; Willand et al., 2019). Charles (70 years old, social housing tenant) did not use his CPAP machine to treat his sleep apnoea 'as much as I need it', because he was worried about the energy costs. Samantha (77 years old, social housing tenant) limited her pain treatment options so as to keep her energy and water bills low.

> I developed something called polymyalgia rheumatica where the body sort of stops functioning and can't move. It's a form of rheumatism. … I deal with chronic pain all the time [and] the way my body feels, like, I don't use hot water anymore for pain treatment. In the other house I had a big old-fashioned bath and because I had instantaneous water supply, I would have a big hot bath and that would reduce the pain level by 50%. But I don't do that here because of the sort [of] hot water system that I've got, so that does add to that level of … anxiety. (Samantha)

Concern about energy usage and cost did not only impact on physical health. Research has shown a relationship between EP and poor mental health (Marmot Review Team, 2011; Thomson et al., 2017). Interviewees worried about their energy bills and cutting expenditure on essentials. Compromising the quality of their life was perceived as contributing to anxiety, stress and depression. Jasmine mentioned she had had suicidal thoughts because of her vulnerable situation, which included late payment of energy bills:

> It makes me feel, you know … how depressed it makes me feel. I tried to suicide twice. It's just so, so embarrassing. Do you know what it's like to line up?[Jasmine is referring to charities where food is handed out and people have to queue]. You know my back hurts, my knee hurts. You have just got to line up for food. It's so, so embarrassing, and you just feel like you're being judged.

Rose passed up events which involved her having to spend money. This caused significant distress:

> If there is another birthday coming up and it's like, you know, that's a stress on my part, because then I won't go to that party, because you know, I don't have a gift. So it impacts my, you know, the way that I look at myself, you know. So yeah, psychologically it affects me.

Energy poverty and capacity to cope with temperature extremes

Physical and mental health might be compromised by thermal discomfort (Ormandy & Ezratty, 2012; World Health Organization, 2018). Particularly for older people, who are more likely to have other comorbidities such as heart disease and high blood pressure, it is harder to cope with temperature extremes (Day & Hitchings, 2011; Gronlund et al., 2016; van Hoof et al., 2017). In the context of climate change, this may become more serious, putting more pressure on the public health infrastructure. Usually, the focus is on winter temperatures (Daniel et al., 2019), but in cities such as Sydney and Melbourne, the impact of extreme summer temperatures is more pertinent. Melbourne typically experiences 30 days over 30 degrees Celsius per annum, whereas Sydney Central Business District typically experiences 18 days over 30 degrees Celsius per annum. Penrith, in western Sydney, has 67 days with temperatures over 30 degrees Celsius, 19 days over 35 degrees Celsius, and four days over 40 degrees Celsius (Bureau of Meteorology, 2021).

Many of the older women interviewed complained about the difficulty of coping with both the cold and the heat. Research has found that women are more sensitive to extreme temperatures (Clancy et al., 2017). On hot summer days, the poor energy efficiency of their homes was a major factor contributing to thermal discomfort. Several of our interviewees did not have an air conditioner or alternatively could not afford to run the one they had. Despite needing to be cool for health

reasons, Adam (63 years old, homeowner) who was unemployed at the time of the interview and had serious health issues, did not have the financial resources to replace his old, inefficient air-conditioner:

> But we don't use the air conditioner because it's too old and inefficient for our purpose. But I really do need it. I really desperately need the air conditioner because of my recent operation in my heart, and I have a heart condition. So, I get very tired and hot easily because of my inability to cope with the hotter weather and humid[ity] … The hotter weather, especially this summer, it's been very energy sapping, very tiring for me … When I'm just trying to do little things, housework or do a little bit of gardening … I can't get any relief at home.

Violet (67 years old, social housing tenant) described how she was overcome on a particularly hot day:

> Like I can't stay here [in her house] in the summer. It's just too hot. I can't breathe in here. One day a friend came over here and I was passed out almost on the couch and she grabbed me and took me outside and took me to her place to cool down. Put me on the couch at her place and got me a cold towel on my head to revive me again. She was ready to call the ambulance. That's how bad it was.

Like Violet, Janine (64 years old, social housing tenant) was adamant that the building envelope of her social housing apartment meant it was difficult to cope with hot summer days:

> It definitely does affect my health during the summer months because I'm just totally exhausted, you know, and the perspiration [is] just pouring off me. I've never felt anything like where I've moved to now. It's just, it's, it's the worst I've ever, ever felt. And unless you're here and experience [it], it's very hard for anyone to realise how bad it really is. So that has affected, that does affect me, too. It's too hot. Even if you hop under the shower, a cool shower, and you step out of it, there is just too much heat, you know, you're just hot again, so there's no point in doing that. I'd do anything to try and keep cool, but it's … virtually impossible. It's because of the building.

Anna (51 years old, private renter, reliant on the Disability Support Pension for her income), the Disability Support Pension amount is the same as the Ae Pension, blamed her unhealthy eating and weight gain during an extremely hot summer on not being able to afford an air conditioner:

> Because of the unusual heat, I found the only way I could keep cool was with ice cream and cold fizzy drinks. Normally I never put drinks in the fridge, but I had to then. I'd just lost 15 kilograms and was insistent I would keep it off - but even I can't deal with 47degree centigrade heat unaided. Instead, I put on 20 kilograms. If I'd had air con to use, I'd be 25 kilograms lighter than I am now. Air con is high on the too expensive to use list.

Some of the interviewees found the winter cold difficult to deal with. In Sydney, the average day temperature in mid-winter is 17 degrees Celsius and the average night temperature is 8 degrees Celsius. Melbourne is colder. The average day temperature in mid-winter is 14 degrees Celsius and at night the average is 7 degrees Celsius. Winter was a major problem for Sonia. Her apartment was extremely cold, and she could only afford to run a small heater:

> So, I was living with the most atrocious carpet … Very thin, threadbare. I could feel the stone underneath. Very cold. It was extremely cold in there. The first winter, I nearly froze to death. So, I think I've had that little heater on a lot. But even so, $600 [her energy bill] was a lot. So, I think I was being overcharged … They [the energy company] were really gouging money from me.

Lauren (87 years old, home owner) found it easier to deal with the winter cold than the summer heat:

> But, you know, my philosophy is that the cold is easier to fix, because you put something warmer on and that's it. But in summer it's worse, because how do you combat the heat? It's very difficult. To me, summer is more [uncomfortable].

Energy poverty and social exclusion

Interviewees noted that they avoided going out, as they needed to 'budget for every cent'. A persistent question was whether the money spent on social activities could be better spent on food, paying for energy and other essentials. Outings with friends or family that involved any expenditure were avoided, and often evoked anxiety and embarrassment (Longhurst & Hargreaves, 2019; Morris, 2016). Sonia explained how her energy costs and rent had had a dramatic impact on her social life:

> I have no social life. I can't afford it … There is one neighbour who was very friendly, and she would ask me out for coffee. Often, I would have to say, 'No, I can't afford to.' That's very embarrassing. It really cuts down your social life completely. You can't even afford to go out for a bit of lunch and a coffee.

Even though Mary (70 years old) is a homeowner she constantly worried about her financial situation and found it difficult to tell her friends about her situation:

> If some friend[s] call me and they say, 'Oh, we [would] like to go for a lunch together', and I have to think, 'If I go out, I have to spend the money, you know, and pay [for] the food, pay the drink. Maybe later they want to have coffee and have a cake'. How much money spent,

> huh? And I say, 'Sorry, today I can't.' I don't say, 'I don't have enough money'.

Violet was unable to join her friends for a restaurant meal or accompany them to the cinema:

> I tell you what, unless my friend pays for a meal if I want to go out with them, I can't afford it. I just can't afford it. There is just no way. It's too much. I'd like to go to a restaurant with my friends every once in a while. I like to go out and see what's happening, but I can't. I can't even go to the movies, you know. I can't afford the movies. It's just not in the budget.

Another common anxiety was having visitors or family stay and the higher energy costs that accompanied their stay. Samantha (77 years old, social housing tenant) had her nephew living with her for a few months, but was relieved when he left:

> When my nephew came to live [here with me], the electricity bill doubled, just with one young man in the house … Younger people overuse it. It might be that they had four showers a day. You never know what it is that they do. So that's something that I have learned. And I decided … [to avoid guests] because I've exhausted my finances.

Denise (77 years old, social housing tenant) lives alone and would normally shower every second day to reduce her hot water use. However, when somebody stayed over, she felt compelled to shower every day:

> And because I live on my own, I can be dirty for as long as I like. I'm not a dirty person, don't get me wrong, but I don't have to have two showers a day, let's put it that way. [But] if I have a friend stay, of course I shower in the afternoon as distinct from the morning so that he can have the morning shower … It's only then [when I have a guest staying] I have a shower a day. The shower gets used on a daily basis, but if it's only me, it's every two days. So, I suspect that I might actually save a bit on that, I don't know.

Jessica could not contemplate socializing when she was a private renter – when interviewed she was living in social housing. After paying the rent and energy bill she had very little money left, and would prefer to spend it on food rather than outings:

> I hardly bought anything then [when she was a private tenant] because I couldn't afford it, yeah … I never went out for a meal. I never went shopping for clothes. Not even a coffee because to me going out for a coffee, I could get something else with it. I could get a packet of Weetabix or something, if that makes sense.

For some interviewees spending a good part of their income on energy had an impact on their internet usage. They either limited its use, turned off the modem to reduce electricity costs or could not pay for a good service. During the COVID-19 pandemic and the resultant lockdown, Rose maintained contact using her phone and Zoom, but was concerned that ultimately she would need to purchase a better plan:

> So even though I am at home [during the COVID pandemic], it's the internet [costs] and all that, because now instead of going out and not using the internet to be able to interact, now I have to use Zoom, which means I have to have, I have to think about - okay two or three months later - I have to sign up for a better internet data connection, NBN or something like that. At the moment I [can still] use my phone because I have [data] credits still available. When that runs out, I have to [get a new plan], and that is going to be a major expense and I am telling you, at the moment I keep postponing it, because I know it's going to be really tight. (Rose).

Social connections can play an important part in alleviating EP, as they provide an opportunity for people to compare bills and check whether they are on fair deals or not, or for someone close to them to help them interpret their energy charges. This was particularly pertinent in the case of interviewees who were computer illiterate, did not have a computer at home or had poor access to the internet. Face-to-face conversations were, in many cases, their only way to learn about energy-related subjects.

The silent suffering of energy poverty

Many older Australians on low incomes have struggled their entire lives and know no other way to cope with high energy costs besides limiting their usage and adapting to the situation (Sherriff et al., 2019). The interviews indicated that many older households tend to suffer from EP in silence and were reluctant seek help. Amelia felt sheepish about approaching charities for assistance with her high bills:

> At times when I've been late with the [energy] bill or you know, unable to pay [it]. I've thought of it [seeking assistance with charities], but I actually haven't. I'm not … I'm out of the loop now and I don't really know where to go [for help].

Rose revealed how she felt 'out of the loop' as a consumer when trying to get answers to why she has not received her low-income state government rebate in her electricity bill:

> I inquired them [the energy retailer] about: 'Look, you know I'm this age, I should have a concession, you know, and you guys knew that when I signed up. Can someone explain to me where is the concession, how is it calculated?' You know. So, no one has really come back to me about these questions.

Some of the interviewees did not perceive that they were energy poor, but viewed their use of energy as energy conscious behaviour typical of a 'war baby', as some described themselves. This thrifty attitude accords with previous research (Cooper et al., 2016; Waitt et al., 2016). It enabled them to negotiate energy practices without feeling stigmatized.

Energy poverty, housing conditions and the health of older Australians

The interviews showed EP impacts the quality of life of low-income older Australians. Excessive energy costs made it difficult to purchase adequate amounts of nutritious food. Some interviewees said their energy costs meant that they were unable to purchase the medical treatments or medication they needed. This inability to purchase what was required appeared to contribute to anxiety and depression.

Thermal discomfort experienced at home, particularly in summer, is an issue that needs addressing. Older pensioners struggling with long-term health conditions that affect the way they experience their home and use energy, often find their health is impaired by EP. Health issues can either be a significant cause of EP due to the need for increased energy use or can be aggravated by EP when medication and medical treatment is difficult to afford.

The interviews reflected the complex interaction of variables which impacted whether a person experiences EP or not. It is apparent that a relatively simple method and succinct overview of housing, health and EP is needed for stakeholders, particularly policy makers. After analysing the interview data, we propose the following conceptualization of the relationship between housing, health and EP (see Figure 1) as a means of determining where people are, on the EP continuum. The variables found in the literature and the interviews were housing conditions which fluctuate from good to bad in respect of thermal performance and running costs. The impact of the housing conditions varied depending on the health of the occupants which are categorized broadly into those with good or poor health.

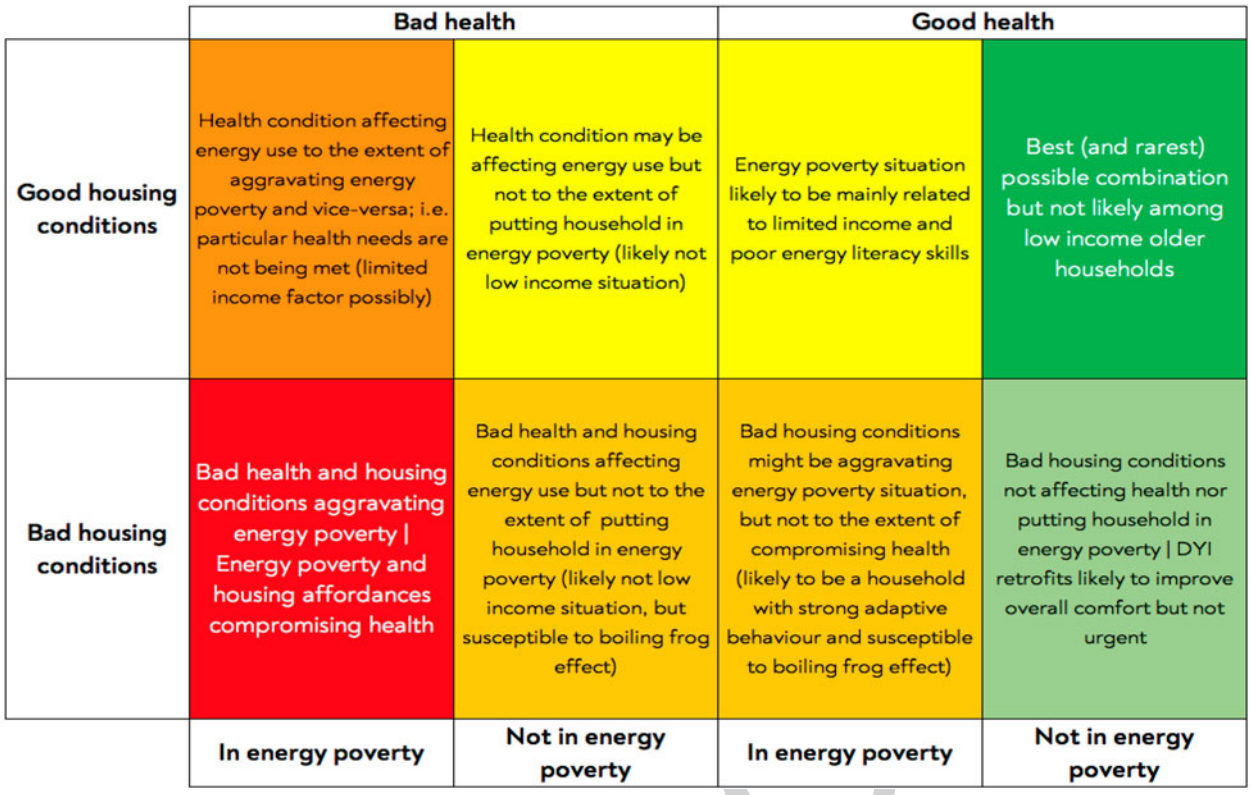
The colours in the figure indicate the severity of the situation. The worst possible combination, in red, refers to an older low-income person in poor health living in inadequate housing (i.e. a home that is not energy efficient and/or needing major repairs/maintenance) and suffering from EP. On the other side of the continuum, in vivid green, is the best combination – an older person in good health, living in an energy efficient house and not experiencing EP. This is followed by the right lower light green combination of bad housing conditions not affecting health or pushing the person into EP. This situation is not likely to pertain to low-income older households, but is possibly the situation of older households with adequate income. The upper left dark orange combination refers to a person whose housing conditions are good, but whose health might affect their energy use. As discussed, health issues can contribute to EP due to increased energy consumption, and can also be aggravated by EP.

The two central lower combinations in light orange beige describe the situation of the majority of older Australians. They mostly live in homes with poor energy efficiency that may influence their energy consumption patterns. However, income and health play an important role in determining whether they will experience EP. Older Australians in these two lower combinations are susceptible to Handy's (2012) 'Boiling Frog' effect. The boiling frog effect refers to a situation where a person does not realize that they may slide into EP. Gradual changes go unnoticed. In the case of older low-income Australians not yet in EP, minor 'unnoticed' changes in energy costs or a decline in their health status might rapidly push them into EP. The individuals already experiencing it may have strong resilient and adaptive (and conditioned) behaviours, but if conditions such as climate change get worse, EP will likely affect their health.

The upper central combinations in yellow describe two less severe cases. The first one refers to a situation where an older household member has a health condition that may affect their energy usage, but, because their housing conditions and income are adequate this does not result in EP. The other combination (central, yellow) describes an older household whose occupants have no health issues and reside in a good home with respect to energy efficiency, but still experience EP. This is most likely due to low income and low energy literacy. In this case, providing this household with assistance and the opportunity to obtain a fair energy deal could lessen or even resolve their EP.

Conclusion

The findings reinforce previous research on the impacts of EP on older people (Day & Hitchings, 2011; O'Neill et al., 2006; Waitt et al., 2016; Willand et al., 2017). The interviews showed that, for low-income older Australians, EP is a central issue impacting on the quality of their lives. The thermal discomfort they experience at home, particularly in summer, is an issue that needs to be addressed in the context of climate change and rising temperatures. Those older pensioners struggling



Colour online, B/W in print

Figure 1. Relationships between housing conditions, health and energy poverty among older Australians (Source: The authors).

with long-term health conditions that affect the way they experience their home and use energy, often are in situations where their health is impaired by EP. The interviews showed how health issues can either be a significant cause of EP due to the need for increased energy use or can be aggravated by EP when medication and medical treatment is difficult to afford.

A further contribution of this study is the conceptualization of how health, housing and EP correlate. Previous research on the impact of energy-efficient features and EP helps us understand this relationship, and this study provided more information on how older Australians experience extreme temperatures, an emerging research topic (see Judson et al., 2019; Willand et al., 2015, 2019). Figure 1 illustrates the different combinations of EP, poor housing conditions and poor health, suggesting where older pensioners might be situated and opening discussion for targeted solutions to alleviate EP.

The overall cost of EP to society and individuals may be far higher than what recent statistics indicate. Also, the health impacts are probably underestimated. Currently, the measurement of EP is inadequate. In Australia it is measured by a few questions related to financial strain, inability to heat the home properly and pay energy bills on time (ABS, 2012; Wilkins et al., 2020). There is a need for more comprehensive and refined survey instruments and a wider use of qualitative methods to capture the extent of EP and its various impacts.

The findings suggest that policymakers need to rethink the way EP is managed. The expectation that older low-income households should just weather EP on their own with no active intervention from government places the individuals concerned in vulnerable situations. The opportunities for older pensioners to learn about and engage with the energy market should be increased. This may help lessen the power and knowledge imbalance between energy retailers and consumers.

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