



Listening to older adults' perspectives on climate change: Focus group study

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Research Paper

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ABSTRACT

This study explores climate change knowledge, attitudes, and experiences of community-dwelling older adults in Edmonton, Alberta. A qualitative descriptive methodology was used where thirty-nine older adults participated in one of six focus groups. A thematic data analysis helped identify three key themes synthesized from participants' narratives: (a) Making sense of climate change, (b) lack of leadership in managing climate change; and (c) actions to address climate change that include an emphasis on individual responsibility and valuing the contributions of older adults. Older adults vary in their climate change literacy and levels of concern about climate change but share a commitment to environmental stewardship and community wellbeing. Expanding opportunities for older Canadians to learn about climate change and engage in climate initiatives will bring multiple benefits to this population and to the climate change movement.

KEYWORDS

Ageism, Aging, Climate Change, Equity, Narratives, Urban

BACKGROUND

Climate change is accelerating with the projected increase of 1.5 °C by 2050 resulting in significant impacts on the natural environment and consequent negative repercussions for human health (Inter-Governmental Panel on Climate Change, 2018). The number of older adults 60 years of age and older will more than double by 2050 to constitute one out of every five people worldwide (World Health Organization, 2020). The impact of climate change on the health of older adults is of increasing concern (Benevolenza & DeRigne, 2019). Older adults can be more vulnerable to climate change than younger people due to lower physiological capacity, multimorbidity, and sensory and mobility deficits that are exacerbated by social and structural barriers

within their living environments (Tilstra et al., 2021). Additionally, the unique needs and vulnerabilities of this population are not prioritized in mitigation efforts and disaster responses (Ayalon et al., 2021). The ability to be prepared for, withstand, and recover from disasters and extreme weather events is contingent on the availability of tangible and emotional social support within familial and community social structures (Chen et al., 2022). Evidence continues to suggest that social isolation and loneliness can be alarmingly high in older age (World Health Organization, 2020) which severely limits access to resources for mitigation and adaptation to the impacts of climate change (Rhoades et al., 2019). Climate change can have exacerbated



negative impacts on older adults, but so can climate policies when the needs of populations experiencing multiple vulnerabilities fail to be considered (Markkanen & Anger-Kraavi, 2019).

Focusing on older adults' vulnerability to climate change due to age and other intersecting factors (multi-morbidity, poor housing, knowledge deficits, social isolation, lack of access to social and health services) results in a deficit-focused lens and exacerbates ageist attitudes in climate narratives. Older adults are a diverse group with varying experiences, understandings, and responses to climate change based on their social locations (Ostapchuk et al., 2015). Older adults have a significant role to play in championing environmental stewardship and are motivated to leave a positive legacy for future generations (Green et al., 2010; Moser, 2016; Zaval et al., 2015).

Furthermore, while the disproportionate risks for older adults due to climate change is often the focus of research (Leyva et al., 2017; Tilstra et al., 2021), older adults have demonstrated high adaptive capacity and resilience when responding to the impacts of climate change (Abrahamson et al., 2008; Miller & Brockie, 2015). The significant impact that climate change has on older adults' wellbeing and their capacity for contributing to climate solutions necessitates their engagement in climate change conversations (Ayalon et al., 2021; Tilstra et al., 2021). Older adults are socially, politically, and economically integrated in their communities but are often excluded from climate planning (Moser, 2016). Their experiences of climate change and capacity for engagement in climate activism continue to be minimally explored (Pillemer et al., 2021).

This study identifies the climate change perspectives of older adults living in Edmonton, Alberta. By 2041, 32% of Edmonton's population is projected to be ≥ 55 years of age (City of Edmonton, 2010). Edmonton is the largest northernmost metropolis and the capital of Alberta, Canada. Future climate change projections point to increasing extreme weather events, warming temperatures, and long-term ecosystem alterations that will require significant human adaptation (City of Edmonton, 2018). Engaging older adults in climate mitigation and

adaptation initiatives is becoming increasingly important. The current study aims to identify older adults' knowledge, attitudes, and experiences related to climate change in Edmonton to better locate strategies for engagement and capacity building in this population.

OBJECTIVES

The study explores older adults' knowledge, attitudes, and experiences of climate change as part of a larger project aimed at creating a subpopulation-specific vulnerability index for the City of Edmonton. Knowledge refers to older adults' understanding of the presence, causes, impacts, and action strategies related to climate change. Attitudes is broadly conceptualized as emotions and related values about climate change, while experiences relate to the range of behaviors and responses to climate change in older adults' daily lives. Two research questions were identified:

1. What are older adults' understandings and experiences of climate change in their communities?
2. How can older adults be better supported to prevent the negative health impacts of climate change?

METHODS

Research Design

A qualitative descriptive methodology (Morse, 2012) with focus groups (Morgan, 1997) was used for this study to explore a wide range of perspectives where narratives of climate change could be told, refuted, and negotiated within a naturalistic group setting. A particular strength of using focus groups is in providing a space for participants to interact around a particular topic of interest, leading to more diverse understandings for both the researcher and participants (Morgan, 1997). Older adults are rarely invited to engage in climate change conversations (Moser, 2016). The focus groups resulted in a space for discussion in a familiar social setting which was meaningful for participants (Liamputtong, 2011).

Setting and Study Participants



Recruitment occurred in the City of Edmonton, Alberta, Canada as the site of the larger study. Inclusion criteria were community-dwelling older adults who are 55 years of age and older and who identified as residents of Edmonton. We chose the age 55 and older in recognition that for some communities the definition of being an older adult can be at a younger age, such as within some immigrant communities. Convenience sampling was utilized where a recruitment email was sent out to seniors-service organizations. Program coordinators at interested organizations reached out to older adults in their communities to identify interested participants. Email recruitment posters were shared via email subscription lists across organizations but word-of-mouth, where coordinators reached out personally to older adults within their organizations, was the most effective form of recruitment.

Data Collection

Data collection began after ethics approval was received from the University Research Ethics Office (Pro00096160) and all participants provided written informed consent. An initial interview guide was created using questions identified in previous qualitative published literature on climate change and community experiences with revisions made to focus on relevance to the local context. Additional questions and probes were added as data collection progressed and important areas for exploration were identified ([Table 1](#)). All older adult participants completed socio-demographic questionnaires.

Two authors (JS, KW) with extensive focus group facilitation experience completed all focus group discussions between November 2019 and November 2021. Focus group facilitators were researchers with expertise in climate change and healthy aging. This combination of expertise helped enable a nuanced discussion of climate change within the broader context of healthy aging. The seven group discussions lasted an average of two hours. The first two focus groups of 16 participants occurred in-person at community centers where participants were regular program attendees. The remaining five focus groups of 23 participants occurred virtually via Zoom due to pandemic restrictions on in-person research

activities. Focus group size ranged from three to ten participants. While variations in the type and quality of data obtained via virtual approaches to data collected have been noted (Davies et al., 2020), focus groups via ZOOM and in-person both yielded rich insights into the research questions.

Difficulties using ZOOM, not owning a microphone or camera for a computer, spotty connectivity, and noise interruptions were noted as challenges with using virtual focus groups in this study. All discussions were audio-recorded and transcribed verbatim by a certified transcriptionist and then subsequently verified by a graduate student.

Data Analysis

Two researchers (JS) and (KW) completed thematic data analysis using both inductive and deductive interpretations of the data via an iterative process (Braun & Clarke, 2006), with the aid of NVivo 12 software program (QSR International, 2018). Initial codes were grouped into preliminary themes which were shared with other members of the research team and discussed in multiple group sessions. Further refinement of the themes occurred via in-depth questioning during subsequent data collection sessions and re-coding as understanding of the data expanded. Audit trails and reflexive memos were used by facilitators and data analysts to increase the transparency of the research process (Morse, 2012) and data analysis results were discussed via multiple team meetings.

RESULTS

In total, 39 older adults were recruited from six seniors service organizations to participate in this study. All participants were residents of Edmonton and were diverse in terms of gender, age, education, migration status, and length of residence in the City ([Table 2](#)). Three main themes were synthesized from participants' responses: (a) Making sense of climate change, (b) lack of leadership in managing climate change, and (c) actions to address climate change ([Table 3](#)). Any names used in the results below have been changed to preserve the anonymity of participants.



Making Sense of Climate Change

This theme captures participants' perspectives of climate change. Older adults in this study varied in their understanding of the causes and approaches needed to address climate change. An area of discussion across focus groups was whether climate change was reversible and whether human activity could have an impact on the progression of environmental and climate deterioration. While some older adults believed that climate change was anthropogenic and reversible, a smaller number disagreed. The following excerpt illustrates some older adults' perceptions of uncertainty about the severity and causes of climate change:

Participant 8: I can be convinced, but I'd have to listen to a lot of people to convince me. Where I grew up we're talking about climate change, and is climate change something new? No, it's not. When I grew up, and I was a kid, it was 40 below...

Participant 2: Well, I just have a little thought. Our dinosaurs, they didn't have fossil fuels. They didn't have all of this. And yet the climate changed, and buried them, and we started all over again. So, is it really our climate that's bad, or is it just part of the process of earth?

Participant 6: Well, in the 50s we were going back to the Ice Age... we weren't going to be able to grow crops or do anything. Now we've got global warming, and I don't understand it at all. I don't know where we're going. (FG5)

Most participants were well informed about the impacts of climate change, although some were not always able to articulate the scientific processes causing these changes. Participants drew from their lived experiences and from the media to describe these impacts. Increased wildfires, flooding, droughts, and global warming were referenced by older adults pointing to this group generally being well informed about the environmental and weather impacts of climate change. Lived experiences over the life course were particularly relevant to older adults where participants compared the weather and natural environment of their childhoods to current

conditions, with changes over decades noted as evidence of climate change:

Not only up North, but I notice that the weather patterns have changed, globally. It is getting a lot hotter where we live here in Alberta. And the summer's a lot hotter, we seem to have more storms than ever before. (P1-FG4).

If you look at the province of Alberta, I can remember 50 years ago... I was raised on a farm and you could go onto a piece of land and there'd be a small stream, and you'd go in there in the winter and you'd clear all the trees off, and then you'd go, and you'd break your land up, and then within two years you could farm right over where that stream was. Now all the moss, all your grasses, all your trees, everything that protects your ground is gone, and the water is gone. So, it's warming up. (P2-FGD1).

Participants were asked about the impacts of climate change on health and, especially, on the health of older adults. They described asthma and breathing difficulties due to wildfires, and heat and cold-related impacts caused by extreme weather variations. Living in a Northern hemisphere city with long winters, the impacts of snow and ice on mobility and risks for falls in older adults was described. Recent increases in the length and severity of heat waves were also discussed by older adults leading to wildfires that exacerbated chronic respiratory conditions and heat exposure-related issues:

For me, like one of my colleagues here, the smoke and the environmental debris in the air really triggered my asthma bad this summer. I've used more asthma medications this summer and fall than [Laughs] I've used in the previous ten years... The heat, I'm thinking of my 92-year-old in-laws, who live independently still, but they had to call an ambulance one day, because my father-in-law fainted. And they figured that in the end, that it was just as a result of heat, and he hadn't been drinking enough. (P7-FG6)

Participants varied, however, in their ability to link health effects caused by weather and environmental changes to climate change. Some participants immediately identified these impacts on health when



asked and others required prompting to make the connection between health and climate change: *“But the actual change in the world’s temperature I don’t think has affected my health.”* (P2-FG1) Participants expressed the need to access reliable information about climate change, its effects, and ways to enhance resilience in mitigating the health impacts. They identified media, peers, and family as important sources of information on the topic with sometimes conflicting information being received from these sources. The need for additional information that is reliable and accessible was unanimously called for by this group:

I want to add that this climate change thing is a new topic for the past 20 years, or 25 years, so most of the people do not exactly understand what exactly climate change is. And when we say, “climate change,” what do we understand? (P7-FG3).

I do find the topic of climate change confusing, and I do get my information probably primarily from the news...you’ll hear different information and sometimes it contradicts each other. (P5-FGD2).

Overall, older adults who participated in this study were well informed of the climate crisis due to conversations about climate change proliferating in the media, politics, and social spheres. Not all participants linked climate change to human activity or recognized the impacts of climate change on their personal health. Most older participants were concerned about climate change and emphasized the need for climate action. The small number who reported not prioritizing climate change, described competing concerns (e.g., financial stability, health, access to necessities), beliefs that climate change was a naturally occurring phenomenon, or lack of information on the issue. For those who described feeling concerned, climate change was viewed as requiring human adaptation and collective efforts towards reversal.

Lack of Leadership in Managing Climate Change

This theme captures the perceived role of government in managing climate and environmental crises. Public transit, waste management, affordable housing, urbanization, deforestation, and carbon

emissions were some of the areas of concern. Participants described mismanagement or inaction by government, and distrust of climate change leaders with the needs of older adults not being considered in policy decisions: *“Seniors’ issues have always been on the back burner, whether it comes to civic government, provincial government, federal government. (P4-FG5)”* Participants emphasized that policies designed to address climate change should not disadvantage their communities:

I’m a believer but I don’t think that we can change it (climate change). I think we just have to adapt to it. And it makes me very upset when all our politicians use that as their lever for everything that we do. (P2-FGD1)

The needs of older adults who were low income or had mobility issues were highlighted as particularly relevant due to these groups being more likely to experience the detrimental impacts of both climate change and poor urban planning. For example, keeping the sidewalks clean from snow and ice and making public transportation easily accessible would decrease the need to use cars in urban settings. Addressing the need of low-income older adults for accessible housing and air-conditioning in hot weather was another area of discussion:

Because a lot of the emphasis these days is that we seniors need to get out and socialize [Yes]. Making transportation more accessible...For low-income people, make sure they have air conditioning when it’s too hot, even if it has to be subsidized by the government. That would contribute to the seniors’ health. (P1-FG6)

Equity in climate action was also discussed in relation to marginalized populations, such as those experiencing homelessness. Lack of affordable housing, rising food costs, lack of infrastructure in rural areas to support climate-friendly initiatives, and rising job insecurity for the younger generation were all emphasized by participants which brought to the forefront that older adults in this study favored systemic approaches that prioritized addressing social inequities:



For a lot of the homeless people. We're not doing a lot, enough for those people. And somehow, we seem to have spent money in strange places. Like they had this E-bike rebate. I think it was up to 7000 dollars for people that wanted to buy an E-bike, that they would reimburse them for that so that they would do a – I think some of these things were like 13,000 dollars...if someone can afford 13,000 dollars, they don't need a rebate for 7000 dollars, when you've got homeless people in the city. We seem to be spending money in the wrong areas. (P1-FG4)

Participants emphasized the need to attend to rural and global inequities in developing climate-friendly policies:

I think governments need to really pay attention to more isolated communities, rural communities. There're things that we have available in the cities. Like you can get an electric car...but if you're in rural Alberta, you're a long way between small towns that may or may not have plug-ins for your car...So that concerns me, that the focus just always seems to be the bigger urban centers... (P7- FG7)

Some participants were immigrants to Canada and described the impacts of climate change in countries of origin such as increased occurrences of flooding or droughts. Other participants reported watching the news and social media which raised awareness of the global impacts of climate change:

What I'm finding is that whilst we're affected quite dramatically by the climate change, I'm finding that low- and middle-income countries are affected even more, and they are experiencing extreme stressors, that's something that we need to address immediately...there's no food in certain parts because of the climate change. The poverty has increased in parts of the world, specifically the low- and middle-income countries, and that really worries me. (P8-FG3)

Across focus groups, participants highlighted the need for more government accountability with regard to climate change while being sensitive to local and global inequities. The need for more transparent communication and trust-building with communities was evident in participants' conversations due to

reports of policy knowledge gaps and skepticism of government-initiated actions. Most importantly, the findings highlight older adults' concerns about climate initiatives that fail to attend to social inequities, including inequities experienced during older age.

Actions to Address Climate Change

Participants in this study overwhelmingly agreed on the need for environmental stewardship where individual responsibility was emphasized: *"I think there are things that we as individuals can do...So, three years ago, we were going to buy a new car...we bought a Prius, a hybrid, so I could cut my gas consumption in half."* (P4-FG7) More questions were raised around the types of individual activities that could be impactful in addressing climate change. Many emphasized that small steps can be taken by individuals that can make a difference, while simultaneously questioning the impact of individual action in face of an overwhelming climate crisis on a global scale:

If they can communicate how the individual person can help. Because right now the individual person feels like there's nothing they can do. But if they say, 'This is what you can do to help' ...to make them feel like they're contributing. (P6-FG5)

Until the big countries who are doing all the mess wake up and make changes, I think not much difference will be made. But any tiny step individuals take can make some difference. (P1-FGD3)

Participants described the need for more education focused on enhancing community agency:

As individuals, we could become better informed, educated about climate change, what is it, what can we do as individuals, and groups...That would give us motivation to do more. (P5-FG6)

Most participants were interested and motivated to contribute to the movement for climate action but some described ageist attitudes that created barriers to meaningful engagement. Older adults in this study evidently wanted to discuss climate change and were aware of many of the social, policy and health



implications. Participants, however, reported a lack of engagement with their demographic and societal attitudes that assumed older adults were not sufficiently interested or committed to climate action:

Participant 3: Yeah. The apathy of the politicians towards the seniors...

Participant 9: Yeah, that's very true.

Participant 7: "We're not going to listen to them." That's what you get from the younger kids, "You're too old. You don't know what you're talking about."

Participant 6: [Laughs] I get the impression that they feel the seniors do absolutely nothing. (FG5)

I find that there were a lot of things that were not orientated towards the seniors but orientated towards younger people...the politicians are all going towards the younger people, because they're the ones that are going to be the voters down the road. They're also the ones that are consumers. As you get older you consume less. (P5-FG4)

Participants described life experiences that brought awareness of the changing climate over their lifetime and knowledge about the ways to live a more sustainable lifestyle. While some older adults talked about competing priorities, like their health and financial needs, caring for the environment was still described by the majority as warranting urgent action. Participants noted that contrary to prevailing assumptions, older adults like themselves were adept at living in a sustainable and environmentally responsible way. Participants, also, emphasized leaving a positive legacy for their children and grandchildren. This was a strong motivator for engaging with climate change issues:

Listening to other seniors, they are aware of it (climate change) and I'm certain they seem to be concerned...because we're thinking about our children and grandchildren and great-grandchildren. What kind of legacy is this to leave them? That in itself should be a big motivator for all of us to clean up our act. (P1-FG6)

The potential for older adults to be allies in climate initiatives and the rich experiences older adults bring to climate change conversations were evident from participants' discussions. Ageist attitudes, climate literacy knowledge gaps, and lack of concrete guidance for individual action were some of the barriers to action described by this sample of older adults. While there was consensus in the focus groups that not all older adults were actively engaged in climate action, participants emphasized that the many older adults were engaged in their communities, cared about the wellbeing of the environment, and were concerned about climate change.

DISCUSSION

This study provides insights into the climate change perspectives of a sample of older adults living in Edmonton, Alberta. We discuss two key learnings from older adults' narratives: (1) the need to tailor climate messaging for older adults and (2) the impacts of ageism on effective climate action.

Climate Messaging and Older Adults

The type of knowledge an individual possesses in combination with their value systems has been shown to predict concern about climate change (Shi et al., 2016). In this study, most participants identified local and global impacts of a changing climate on the environment and the wellbeing of their communities, often from their lived experience and from the media. Variations were noted in knowledge related to causes of climate change, whether climate change was reversible, impacts on health, and overall sense of concern about climate change. Lack of knowledge and awareness of personal risks about the health impacts of climate change was highlighted in other studies on older adults (Abrahamson et al., 2009; Haq, 2013; Valois et al., 2020).

Distrust, fear, and uncertainty demonstrated via lack of clarity about approaches to climate action and the possibility of effective change shows the importance of understanding the role of emotion in climate messaging (Chapman et al., 2017) and the role of trust in enhancing people's willingness to support climate policies (Smith & Mayer, 2018). The



need for more public “climate literacy” has been emphasized to increase support for climate policies (Kundzewicz et al., 2020) and was noted in this study, especially as this relates to trust in the commitment to and effectiveness of climate policies.

Many older adults in this study were uncertain about the individual actions required to create change and the effectiveness of collective action in addressing the climate crisis. Behavior change is more likely to occur when individuals feel a sense of control and agency in handling climate-related problems to both minimize the impacts of climate change and maximize their adaptive capacity (Valois et al., 2020). Creating spaces where older adults can discuss their worries and ways to approach feelings of hopelessness is important as participants in this study displayed strong emotions in their discussions. Older adults in this study were concerned about the wellbeing of their communities. Positive coping strategies that emphasize both personal agency and community collaboration in tackling climate issues are one avenue highlighted in the literature (Ojala et al., 2021; O’Neill & Nicholson-Cole, 2009) and have the potential to enhance climate resilience in this population (Rhoades et al., 2019).

Tackling Ageism in Climate Action

It is evident from participants’ discussions that ageism plays a role in the exclusion of older adults from engagement in climate change action and that older adults are both aware of this and engage in counter-narratives such as labeling “seniors as allies” and emphasizing “individual accountability”. This study disrupts the negative discourses that paint older adults as victims of climate change, responsible for the climate crisis and/or apathetic to it. While older adults lag behind younger age groups in their concern about climate change and perceptions of personal accountability for climate change (Andor et al., 2018), evidence suggests that attitudes are changing over time towards a stronger belief in climate change and human agency (Milfont et al., 2021). Older adults identified their capacity for agency and, despite variations in knowledge and attitudes, shared common values around environmental stewardship and intergenerational legacy building. Both values can serve as rallying

points for this group. The desire to leave a legacy in the form of a better planet and transmit knowledge to the younger generation are strong motivators for older adults to engage in environmental advocacy (Chen et al., 2022; Miller, 2018; Pillemer et al., 2017).

Addressing inequities is highlighted in older adults’ narratives mirroring current calls by climate justice advocates for justice-oriented policies (Markkanen & Anger-Kraavi, 2019) and intersectional approaches to the syndemic of sexism, ageism, classism, racism and other -isms (Kaijser & Kronsell, 2014). Older adults’ narratives reveal a tension between values for environmental stewardship and everyday needs such as food, housing, and mobility. Basic needs in older age to fulfill a “good life” are viewed in comparison to climate policies that might not always incorporate an equity perspective. This points to the need for intentionality in addressing older adults’ concerns for living well in the final decades of life amidst climate, economic, and social turmoil. “How can we include older adults in decision-making in meaningful ways?” is a question that needs to be asked and the solutions actively implemented.

Addressing the climate emergency must occur simultaneously via building solidarity and agency within older adults’ communities to foster adaptive capacities and resilience (Sultana, 2021). Older adults have been shown to participate in environmental stewardship and climate advocacy (Miller, 2018; Pillemer et al., 2017). This study shows that older adults embody a high sense of responsibility for their communities but that engaging them on the topic of climate change will require listening to their concerns and co-creating solutions with them. We argue that building more opportunities for environmental volunteerism (Pillemer et al., 2017; Pillemer & Filiberto, 2017) that includes a focus on climate change and builds skills, knowledge, and capacity for older adults to participate has much potential for enhancing the effectiveness of climate change mitigation and adaptation strategies.

STUDY STRENGTHS AND LIMITATIONS

The findings of this study cannot be generalized due to the small convenience sample, but it provides rich insights into the way one group of older adults



converse about climate change. Older adults' experiences and perceptions of climate change are not well documented in Canada and this study provides a rich case exemplar in an urban setting. The majority of study participants were educated, women, non-racialized and young-old. The perspectives of older adults with varying social locations need to be further incorporated into studies on aging and climate change in recognition of the diverse lived experiences of this demographic and the varying biomes that are affected differentially across the country.

CONCLUSION

This study provides new insights into the ways older adults discuss climate change, including their knowledge, values, and concerns. It is evident that the perspectives of older adults on climate change are diverse, but that they share a concern for the wellbeing of their communities and future generations and that they have valuable insights of benefit to our collective efforts towards climate action. Interventions aimed at engaging older adults in climate change action are needed to decrease the risks for adverse health outcomes in this population and strengthen the equity dimension of climate policies.

REFERENCES

Abrahamson, V., Wolf, J., Lorenzoni, I., Fenn, B., Kovats, S., Wilkinson, P., Adger, W. N., & Raine, R. (2009). Perceptions of heatwave risks to health: Interview-based study of older people in London and Norwich, UK. *Journal of Public Health, 31*(1), 119-126. <https://doi.org/pubmed/fdn102>

Andor, M. A., Schmidt, C. M., & Sommer, S. (2018). Climate change, population ageing and public spending: Evidence on individual preferences. *Ecological Economics, 151*, 173-183. <https://doi.org/10.1016/j.ecolecon.2018.05.003>

Ayalon, L., Keating, N., Pillemer, K., & Rabheru, K. (2021). Climate change and mental health of older persons: A human rights imperative. *American Journal of Geriatric*

Psychiatry, 29(10), 1038-1040. <https://doi.org/10.1016/j.jagp.2021.06.015>

Benevolenza, M. A., & DeRigne, L. (2019). The impact of climate change and natural disasters on vulnerable populations: A systematic review of the literature. *Journal of Human Behavior in the Social Environment, 29*(2), 266-281. <https://doi.org/10.1080/10911359.2018.1527739>

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. <http://doi.org/10.1191/1478088706qp063oa>

Chapman, D. A., Lickel, B., & Markowitz, E. M. (2017). Reassessing emotion in climate change communication. *Nature Climate Change, 7*(12), 850-852. <https://doi.org/10.1038/s41558-017-0021-9>

Chen, P.-W., Chen, L.-K., Huang, H.-K., & Loh, C.-H. (2022). Productive aging by environmental volunteerism: A systematic review. *Archives of Gerontology & Geriatrics, 98*. <https://doi.org/10.1016/j.archger.2021.104563>

City of Edmonton. (2018). *The Climate Resilient Edmonton: Adaptation Strategy and Action Plan*. https://www.edmonton.ca/sites/default/files/public-files/assets/Climate_Resilient_Edmonton.pdf?cb=1643406386

City of Edmonton. (2010). *Edmonton Seniors: A Portrait*. <https://www.seniorscouncil.net/uploads/files/Seniors%20Portrait.pdf>

Davies, L., LeClair, K. L., Bagley, P., Blunt, H., Hinton, L., Ryan, S., & Ziebland, S. (2020). Face-to-face compared with online collected accounts of health and illness experiences: A scoping review. *Qualitative Health Research, 30*(13), 2092-2102. <https://doi.org/10.1177%2F1049732320935835>

Green, D., Billy, J., & Tapim, A. (2010). Indigenous Australians' knowledge of weather and climate. *Climatic Change, 100*(2), 337-354. <https://doi.org/10.1007/s10584-010-9803-z>



- Haq, G., Snell, C., Gutman, G., & Brown, D. (2013). *Global Ageing and Environmental Change*. Stockholm Environment Institute, University of York, York. <https://mediamanager.sei.org/documents/Publications/SEI-ProjectReport-Haq-GlobalAgeingAndEnvironmentalChange-2013.pdf>
- Inter-Governmental Panel on Climate Change [IPCC]. (2018). Summary for Policymakers. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].
- Kaijser, A. & Kronsell, A. (2014). Climate change through the lens of intersectionality. *Environmental Politics*, 23(3), 417-433. <https://doi.org/10.1080/09644016.2013.835203>
- Kundzewicz, Z. W., Matczak, P., Otto, I. M., Otto, P. E. (2020): From 'atmosfear' to climate action. *Environmental Science and Policy*, 105, 75-83. <https://doi.org/10.1016/j.envsci.2019.12.012>
- Leyva, E. W. A., Beaman, A., & Davidson, P. M. (2017). Health impact of climate change in older people: An integrative review and implications for nursing. *Journal of Nursing Scholarship*, 49(6), 670-678. <https://doi.org/10.1111/jnu.12346>
- Liamputtong, P. (2011). *Focus group methodology: Principles and practice*. SAGE
- Markkanen, S., & Anger-Kraavi, A. (2019). Social impacts of climate change mitigation policies and their implications for inequality. *Climate Policy (Earthscan)*, 19(7), 827-844. <https://doi.org/10.1080/14693062.2019.1596873>
- Miller, E., & Brockie, L. (2015). The disaster flood experience: Older people's poetic voices of resilience. *Journal of Aging Studies*, 34, 103-112, <https://doi.org/https://doi.org/10.1016/j.jaging.2015.05.003>.
- Miller, E. (2018). "My hobby is global warming and peak oil": Sustainability as serious leisure. *World Leisure Journal*, 60(3), 209-220. <https://www.tandfonline.com/doi/abs/10.1080/16078055.2018.1496528>
- Moser, S. C. (2016). Never too old to care: Reaching an untapped cohort of climate action champions. *Public Policy & Aging Report*, 27(1), 33-36. <https://doi.org/10.1093/ppar/prw029>
- Morgan, D. L. (1997). *Focus groups as qualitative research. [electronic resource]* (2nd ed.). SAGE
- Morse, J. M. (2012). *Qualitative health research: Creating a new discipline*. Left Coast Press
- Milfont, T. L., Zubielevitch, E., Milojev, P., & Sibley, C. G. (2021). Ten-year panel data confirm generation gap but climate beliefs increase at similar rates across ages. *Nature Communications*, 12(1). <https://doi.org/10.1038/s41467-021-24245-y>
- O'Neill, S. & Nicholson-Cole, S. (2009). "Fear Won't Do It": Promoting positive engagement with climate change through visual and iconic representations. *Science Communication*, 30(3), 355-379. <https://doi.org/10.1177%2F1075547008329201>
- Ojala, M., Cunsolo, A., Ogunbode, C. A., & Middleton, J. (2021). Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review. *Annual Review of Environment & Resources*, 46, 35-58. <https://doi.org/10.1146/annurev-environ-012220-022716>
- Ostapchuk, J., Harper, S., Willox, A. C., PhD, Edge, V. L., & Rigolet Inuit Community Government. (2015). Exploring elders' and seniors' perceptions of how climate change is impacting health and well-being in Rigolet, Nunatsiavut. *Journal of Aboriginal Health*.



- https://jps.library.utoronto.ca/index.php/ijih/article/view/29095/pdf_9
- Pillemer, K., Tillema-Cope, M., & Nolte, J. (2021). *Older People and Action on Climate Change: A Powerful but Underutilized Resource*. Commissioned report for HelpAge International.
https://www.unescap.org/sites/default/d8files/event-documents/KPillemer_paper.pdf
- Pillemer, K., & Filiberto, D. (2017). Mobilizing older people to address climate change. *Public Policy & Aging Report*, 27(1), 18-21.
<https://doi.org/10.1093/ppar/prw030>
- Pillemer, K., Wells, N. M., Meador, R. H., Schultz, L., Henderson, C. R., Cope, M. T. (2017). Engaging older adults in environmental volunteerism: The Retirees in Service to the Environment Program. *Gerontologist*, 57(2):367-375.
<https://doi.org/10.1093/geront/gnv693>.
- QSR International Pty Ltd. (2018). NVivo (Version 12).
<https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
- Rhoades, J., Gruber, J., & Horton, B. (2019). Promoting the resilience of older adults through participatory climate change adaptation planning. *Journal of Homeland Security & Emergency Management*, 16(3).
<https://doi.org/10.1515/jhsem-2017-0057>
- Shi, J., Visschers, V. H., Siegrist, M., & Arvai, J. (2016). Knowledge as a driver of public perceptions about climate change reassessed. *Nature Climate Change*, 6(8), 759-762.
- Smith, E. K. & Mayer, A. (2018). A social trap for the climate? Collective action, trust and climate change risk perception in 35 countries. *Global Environmental Change*, 49, 140-153.
<https://doi.org/10.1016/j.gloenvcha.2018.02.014>
- Sultana, F. (2021). Climate change, COVID-19, and the co-production of injustices: A Feminist reading of overlapping crises. *Social & Cultural Geography*, 22(4), 447-460.
<https://doi.org/10.1080/14649365.2021.1910994>
- Tilstra, M. H., Tiwari, I., Niwa, L., Campbell, S., Nielsen, C. C., Jones, C. A., ... & Yamamoto, S. S. (2021). Risk and Resilience: How Is the Health of Older Adults and Immigrant People Living in Canada Impacted by Climate-and Air Pollution-Related Exposures? *International Journal of Environmental Research and Public Health*, 18(20), 10575.
- World Health Organization. (2020). UN Decade of Healthy Aging.
<https://www.who.int/initiatives/decade-of-healthy-ageing>
- Zaval, L., Markowitz, E. M., & Weber, E. U. (2015). How will I be remembered? Conserving the environment for the sake of one's legacy. *Psychological science*, 26(2), 231-236.
<https://doi.org/10.1177%2F0956797614561266>
- Valois, P., Talbot, D., Bouchard, D., Renaud, J.-S., Caron, M., Canuel, M., & Arrambourg, N. (2020). Using the theory of planned behavior to identify key beliefs underlying heat adaptation behaviors in elderly populations. *Population & Environment*, 41(4), 480-506.
<https://doi.org/10.1007/s11111-020-00347-5>



Table 1. Interview Guide Sample Questions

1	What do you know about climate change?
2	Do you feel that climate change is important? Why or why not?
3	As the years go by have you noticed changes in the weather? The environment around you? What are these changes? How do they impact you?
4	Do you feel that your health is at risk due to climate change?
5	How confident are you in your ability to adapt to the possible risks and/or problems posed by climate change?
6	What role does government have in addressing climate change?
7	Where do you get your information on climate change? How reliable are these sources of information?
8	What resources, information, and interventions are needed to help older adults adapt to the impacts of climate change?



Table 2. Socio-Demographic Characteristics

Characteristics	n=39
Age, Years, n (%)	
55-65	6(15%)
66-75	17(43%)
76-85	10(26%)
86 and older	3(8%)
Not reported	3(8%)
Gender, Woman, n (%)	31 (79%)
Education, n (%)	
Elementary	1(2%)
Completed High School	14(36%)
Received Post-Secondary	21(54%)
Not reported	3 (8%)
Immigrant Status	5 (13%)
Years Lived in Edmonton, n (%)	
<5 years	2 (5%)
5-10 years	2 (5%)
>10 years	35 (90%)



Table 3. Thematic Analysis Findings

Themes	Related Codes (# references across data)
Making Sense of Climate Change	<ul style="list-style-type: none">• Differing understandings of climate change (43 references)• Perceived impacts of climate change on health (26 references)• Negative impacts of climate change on environment (30 references)• Lack of access to information about climate change (38 references)
Lack of Leadership in Managing Climate Change	<ul style="list-style-type: none">• Mismanagement or inaction by government (31 references)• Balancing needs of older adults and marginalized groups (40 references)
Actions to Address Climate Change	<ul style="list-style-type: none">• Older adults as allies (10 references)• Individual actions matter (29 references)