Title: An online cross-sectional survey of the health risk behaviours among informal caregivers

Running title: Health risk behaviours among informal caregivers

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1002/hpja.296](https://doi.org/10.1002/hpja.296)

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Funding/Acknowledgements

AMJD is supported by a Research Training Program (RTP), University of Newcastle PhD Scholarship and Hunter Medical Research Institute/Emlyn and Jennie Thomas Postgraduate Medical Research Scholarship. ALB is supported by an NHMRC Senior Research Fellowship. NJS was the recipient of a co-funded National Health and Medical Research Council/National Heart Foundation Career Development/Future Leader Fellowship (APPS1110629/100827). BB is supported by the University of Newcastle, and a Faculty of Health and Medicine, University of Newcastle Gladys M Brawn Career Development Fellowship.

Declaration of interest statement

No potential conflict of interest was reported by the authors.

Article type: Short Research Article

Abstract

Issue addressed: Informal caregivers may experience unique barriers to engaging in healthy lifestyles, consequently increasing their risk of chronic disease. Among a convenience sample of informal caregivers, this study aimed to: (1) assess the self-reported health risk behaviours of low fruit and vegetable consumption, low physical activity, current smoking and hazardous alcohol consumption; (2) examine the demographic, care condition, and country of residence variables associated with each health risk behaviour; and (3) report the engagement in multiple health risk behaviours.

Methods: An online cross-sectional survey among caregivers in Australia, Canada, New Zealand, The United Kingdom and the United States was conducted. Self-reported health risk behaviours were assessed and compared to key Australian healthy living guidelines. Logistic regression modelling identified participant factors associated with each health risk behaviour.

Results: Overall, 384 caregivers were included in the analysis. Hazardous alcohol consumption was the only self-reported health risk behaviour which was much higher than in the general population (60.0%). Caregiver age ($p=0.018$) and country of residence ($p=0.015$) were associated with hazardous alcohol consumption. The majority of caregivers reported engaging in three health risk behaviours (55.0%).

Conclusions: Caregivers are engaging in a range of health risk behaviours; however, rates of hazardous alcohol consumption among the sample were high. Health promotion interventions targeted to address alcohol consumption should consider caregiver age and country of residence.

So what? This study highlights the health risk behaviours caregivers engage in across a number of countries, and suggests that caregivers require further support to manage alcohol consumption in particular.

Keywords: health behaviours; alcohol consumption; smoking; physical activity; nutrition

Introduction

Informal caregivers, also known as carers, may be family members, friends or other people who provide physical or emotional support to someone with a diminishing physical ability, a debilitating cognitive condition or a chronic life-limiting illness¹ (also known as the care recipient, or caree). The numbers of informal caregivers in high-income countries is high: for example in the United States (USA), there are 43.5 million informal caregivers; in the United Kingdom (UK) there are 6.5 million; and in Australia there are 2.9 million^{1, 2}. Informal caregivers may assist with numerous and complex tasks, ranging from day-to-day instrumental activities of daily living such as assisting with managing personal hygiene or attending appointments, to providing emotional and psychological support³. On average, caregivers report spending 20 hours per week on providing care, however caregivers providing care for a spouse or someone with higher needs report an average of 40 hours per week³⁻⁵.

While caregiving has been shown to be associated with a negative impact on the caregivers' health and well-being, including declines in mental and physical health⁶⁻¹², there is limited research on key health risk behaviours amongst informal caregivers, and if there are priority areas of health risk behaviours among this group that need to be addressed. There is evidence of engagement in health behaviours from caregiver groups (also known as caree conditions) including caregivers of people who have dementia^{6, 10}, people who have had a stroke^{7, 9}, and people who have cancer^{8, 11}. The findings of a systematic review⁸ suggested an association between providing care for someone who has cancer and the caregivers' health risk behaviours such as poor diet, tobacco use, low physical activity, and drug and alcohol use; however, the findings were "conflicting and inconclusive". Further differences in mental

and physical health between caregivers and non-caregivers have been investigated in two meta-analyses^{10, 12}. Pinquart et al. reported significant differences in physical health in favour of non-caregivers¹². Vitaliano et al. found that informal caregivers experienced a slightly greater risk for health problems than non-caregivers; however moderating variables such as gender impacted this relationship¹⁰. Furthermore, previous research has also shown that increased psychological distress and caregiver burden have a negative relationship with the ability to engage in positive health behaviour change and self-care in some caregiving groups^{13, 14}. As caregivers experience unique barriers to maintaining a healthy lifestyle, such as restrictions on time to engage in healthy behaviours such as exercise, or attending appointments with a healthcare provider for their own health¹⁵, they may be more at risk for developing and experiencing chronic disease, ill-health and lower quality of life.

Given the key roles that informal caregivers perform, this group may experience unique challenges and barriers to managing their own health in addition to the health of the person that they care for¹⁵. This may lead to an increased risk of developing chronic diseases, which are leading causes of morbidity and mortality in high-income countries¹⁶. Preventable health risk behaviours such as inadequate fruit and vegetable intake, smoking, physical inactivity, and hazardous alcohol consumption have been identified as key determinants of overall health¹⁶⁻²¹. Engaging in multiple health risk behaviours can decrease an individual's life expectancy and quality of life¹⁶. Furthermore, evidence suggests that a person's physical health and mental health are related²¹. Factors associated with engaging in health risk behaviours include sociodemographic factors such as country and cultural context^{16, 22} and low socioeconomic status²³. Identifying and examining these key determinants of health amongst informal caregivers may provide insight into priority areas for intervention, and potential points of prevention for chronic disease and illness.

While high-income English speaking countries may appear similar programs, resources, initiatives, and policies often differ by country. For example, informal carers who live in Canada are not formally recognized by federal legislation, which limits their access to support services that may safeguard their health and well-being². In the USA, the support that caregivers can access and receive varies widely, and depends on the qualifying criteria of the consumer²⁴. These factors include the state that the caregiver resides in, available personal finances for out-of-pocket costs, and the qualifying criteria of the caree, such as holding veteran status^{2, 25}. Comparatively, in Australia, Canada, New Zealand, and the United Kingdom, consumers receive a variation of publicly funded health care systems in which they

receive access to many health services at little to no cost^{24, 26-28}. While it is clear that country-related factors may influence unmet needs for support among caregivers to engage in a healthy lifestyle, research has yet to provide evidence of the country-specific differences in health risk behaviours. Understanding possible similarities would allow for the development of support programs that could address the health risk behaviours of caregivers across a range of countries. Alternatively, if the engagement in particular health risk behaviours is exclusive to the country, tailored programs to provide domestic and local support for informal caregivers may need to be developed.

It is important to identify and understand the health risk behaviours of caregivers to develop interventions and programs to improve those health behaviours. Among a convenience sample of informal caregivers, the aims of this study were to: (1) assess the self-reported health risk behaviours of low fruit and vegetable consumption, low physical activity, current smoking and hazardous alcohol consumption; (2) examine the demographic, career condition, and country of residence variables associated with each health risk behaviour; and (3) report the engagement in multiple health risk behaviours.

Materials and methods

Study design

An online cross-sectional survey was conducted. The study received approval from the University of Newcastle Human Research Ethics Committee, Approval No. H-2017-0312.

Setting

This online study used targeted Facebook advertising as the primary recruitment strategy, in addition to advertising the study on relevant online platforms and social media between March and August 2018.

Sample

Participants were eligible to participate if they were: (1) 18 years or older, (2) comfortable participating in English; and (3) currently an informal caregiver of a person with a chronic illness or disability. This included spouses, family members and friends. Participants were excluded from this study if they identified as a professional caregiver, such as a paid caregiver, doctor or nurse.

Procedure

Participants were targeted by paid Facebook advertising if they were older than 18 years old, living in Australia, Canada, NZ, the UK or the USA, and “liked” caregiving Facebook pages.

Advertising occurred in three ten-day bursts over the recruitment period. In addition, various caregivers' organisations were contacted and agreed to promote the research via their online networks. The study was also shared on Twitter, in caregiver Facebook groups and communities, and other publicly accessed websites that had active users who identified as informal caregivers. Participants were provided a full information statement before starting the survey. The survey elicited demographic information, health risk behaviours and needs. Participants indicated their consent by starting the survey, which took around 15 minutes to complete.

Measures

Demographic characteristics and health conditions

Demographic information collected included country of residence, age (years), gender, marital status, education, employment status, income, main source of income, duration of caregiving (years), the relationship with caree, caree age, caree gender, whether the caregiver lived with their caree, and the chronic health condition experienced by the caree. Table 1 shows the categorical variables used, and the demographic variables which were collapsed into clinically similar groups. The following categories were collapsed: caregiver age (years), marital status, education, duration of caregiving (years), relationship with caree, and caree age. Original assessment items and collapsed categories are included in supplementary material Table S1.

Fruit and vegetable consumption

Fruit and vegetable consumption was assessed using the two Australian National Health Survey fruit and vegetable items²⁹. Participants recorded how many serves of fruit and vegetables they usually ate each day. Low fruit and vegetable intake was defined as eating fewer than two pieces of fruit and five serves of vegetables each day³⁰.

Physical activity

Physical activity was assessed using the Godin Leisure-Time Exercise Questionnaire (GLTEQ)³¹. The total number of occasions participants reported performing mild, moderate or vigorous activity for more than 15 minutes per week were summed. The number of metabolic equivalent or MET-minutes of exercise per week were calculated based on summing the weights given to the type of exercise (mild, moderate and vigorous). Physical activity was then compared to the Australian Physical Activity Guidelines^{32, 33} and categorized participants into recommended and low physical activity groups based on their

activity over the previous week. Low activity was defined as less than a combination of moderate- and vigorous-intensity exercise to achieve a total energy expenditure of ≥ 500 -1000 MET-minutes per week³³.

Smoking

Smoking was assessed using a standard two-item measure that assesses smoking status³⁴. The following two items: "Have you smoked at least 100 cigarettes or a similar amount in your lifetime?" and "Do you currently smoke any tobacco products?" were used to calculate the proportions of participants who reported being a current smoker, ex-smoker or never smoker. For logistic regression purposes, the two binary outcomes for smoking status were current smoker and non-smoker (ex-smoker or never smoker).

Alcohol consumption

Alcohol consumption was measured using the Alcohol Use Disorders Identification Test - Consumption (AUDIT-C)³⁵. The AUDIT-C is a three-item screening tool that includes items regarding frequency of alcohol use, number of drinks consumed on a typical drinking day and frequency of binge drinking. Responses from the AUDIT-C were summed (on a scale of 0–12) and participants were categorized into hazardous and safe levels of alcohol consumption; a score of 4 or greater in men, or a score of 3 or greater in women, indicated hazardous drinking behaviour, or risk of having an alcohol use disorder³⁵.

Statistical analyses

Descriptive analysis of demographic characteristics were presented as count and percent for categorical measures. Differences between countries on demographic variables were assessed performing a Chi-square analysis, or using Fisher's exact test where appropriate. Health conditions of the carees were defined as: (1) Alcohol or other drug issue; (2) Alzheimer's, dementia; (3) Cancer; (4) Mental/emotional illness; (5) Mobility, physical disability; (6) "Old age", frailty; (7) Stroke; and (8) Other. As only four people indicated that they cared for someone who had an Alcohol or other drug issue, this category was collapsed into the "Other" category. The proportion of health risk behaviours each caregiver engaged in was calculated by country of residence and caree condition.

Logistic regression modelling was performed to examine the crude and adjusted associations between demographic, caree condition, and country of residence variables and smoking status (current smoker, non-smoker) and alcohol consumption (safe levels of alcohol consumption, hazardous levels of alcohol consumption); demographic, caree condition, and

country of residence characteristics included in modelling were decided a priori based on previous literature and content knowledge^{36, 37}. Participants were only included in the logistic regression modelling for excessive alcohol consumption if they completed all questions on the AUDIT-C measure to receive a final score. One of the a priori aims of the study was to examine the demographic, caree condition, and country of residence variables associated with each health risk behaviour; however, the nature of the data did not permit this analysis to be conducted on two of the health risk behaviours of interest. Due to high engagement in the health risk behaviours of low fruit and vegetable consumption (n=367, 95.6%) and low physical activity (n=354, 99.4%), the sample was not powered to perform logistic regression modelling on these health risk behaviours. Collinearity of predictors was assessed using VIFs to determine the appropriate predictors to be included in modelling. Adjusted odds ratios with 95% confidence intervals (CIs), odds ratios and p-values were calculated and presented for each model. Crude odds ratios with 95% confidence intervals (CIs), odds ratios and p-values were presented in online supplementary material Table S2.

The statistical package Stata v14.0³⁸ was used for all statistical analysis. Significance of associations was specified as $p < 0.05$ (2-tailed) a priori.

Results

[Insert Figure 1]

Figure 1 shows study recruitment. Overall, 2183 people clicked on the survey. While 591 people entered data into the online survey, 384 responses were included in the final analysis as they answered at least one question regarding health risk behaviours. However, not all questions were answered by all respondents and as a result sample sizes differ according to question.

[Insert Table 1]

The demographics of the sample are presented in Table 1. The majority of caregivers were aged between 45 and 65 years (n=218, 56.8%). The majority of participants identified as female (n=330, 85.9%) and the largest proportion of participants lived in Australia (n=181, 47.1%). Most provided care for a family member who was not their spouse, such as their parent or child (n=192, 53.5%). The most commonly reported caree condition was 'Other' (n=106, 27.6%) which included Autism (n=13), brain injury (n=12) and intellectual disability (n=12) among various other disabilities/issues and comorbidities. Chi-square analysis and

Fisher's exact test showed that differences in caregiver age, caregiver gender, caregiver education, caregiver income, caree condition, caregiver relationship, caree age, and if the caree and caregiver live together were statistically significant across countries ($p = <0.05$). Table 2 shows the self-reported health risk behaviours of informal caregivers by caree condition, and Table 3 shows the self-reported health risk behaviours of informal caregivers by country.

[Insert Table 2]

[Insert Table 3]

Fruit and vegetable consumption

The vast majority of caregivers had low fruit and vegetable consumption ($n=367$, 95.6%). The country with the highest proportions of caregivers meeting the guidelines for recommended fruit and vegetables was the UK ($n=3$, 9.1%), and the caree condition was "Old Age"; frailty ($n=2$, 9.5%). As over 95% of the participants in this study reported engaging in low fruit and vegetable consumption, the sample was not powered to perform logistic regression modelling on this health risk behaviour.

Physical activity

Nearly all caregivers in the sample ($n=354$, 99.4%) reported low levels of physical activity; only two caregivers who participated in the survey met the recommended amount of physical activity in the compared to the Australian Physical Activity Guidelines^{32, 33}. As over 99% of the participants in this study reported engaging in low levels of physical activity, the sample was not powered to perform logistic regression modelling on this health risk behaviour.

[Insert Table 4]

Smoking

The majority of the sample were non-smokers ($n=233$, 61.6%) followed by ex-smokers ($n=98$, 25.9%) and current smokers ($n=47$, 12.4%). The caree condition with the highest proportion of current smokers were caregivers of people with cancer ($n=6$, 28.6%). The country which had the highest proportion of current smokers was the USA ($n=11$, 15.3%). The logistic regression model (see Table 4) failed to suggest that any self-reported demographic, caree condition, and country of residence variables were significantly associated with smoking status.

Alcohol consumption

Over half of the caregivers in this sample engaged in hazardous alcohol consumption (n=226, 60.0%). The care condition that engaged in the highest proportion of hazardous alcohol consumption were caregivers of people who had experienced a stroke (n=44, 62.0%). The countries which had the highest proportion of caregivers engaging in hazardous alcohol consumption were: the UK (n=24, 72.7%) NZ (n=21, 65.6%) and Australia (n=110, 61.8%). Logistic regression modelling (see Table 4) found that engaging in hazardous alcohol consumption was significantly associated with caregiver age (p=0.018) and country that the caregiver lived in (p=0.015). The odds of engaging in hazardous alcohol consumption for caregivers aged 18–45 years were 3.78 times higher than that of caregivers aged 65+ years (p=0.005). On average, caregivers who lived in Australia engaged in hazardous alcohol consumption 55% more than caregivers who lived in the USA (p=0.038).

Health risk behaviours

The majority of the sample engaged in three health risk behaviours (n=193, 55.0%). Just six participants (1.7%) engaged in only one health risk behaviour, and none engaged in no hazardous health behaviours. The UK was the country with the highest proportion of caregivers engaging in three risk behaviours (n=20, 62.5%).

Discussion

This study aimed to assess the self-reported health risk behaviours of among a convenience sample of informal caregivers and examined the variables associated with engaging in each health risk behaviour. This study also reported the proportion of caregivers in this sample who engaged in multiple health risk behaviours. These results suggest that informal caregivers are engaging in multiple health risk behaviours which may impact their health and wellbeing. Previous research has found that the mortality risk greatly increases for those engaging in multiple health risk behaviours, and those who report engaging in all four health risk behaviours increases dramatically – a four-fold difference in mortality and an estimated impact of 14 years in chronological age¹⁶. The majority of the sample engaged in at least three health risk behaviours. While this health concern for engagement in health risk behaviours, reduced morality and quality of life appears to span the general population^{39, 40}, informal caregivers may need tailored programs and support in addition to that offered to the general population to engage in healthier lifestyles.

Rates of hazardous levels of alcohol consumption were high in the study sample (n=226, 60.0%). Alcohol consumption in spousal caregivers has previously been reported to be 30.3%⁴¹-34.1%⁴². We found that caregiver engagement in hazardous alcohol consumption is significantly associated with the age of the caregiver and the country that they live in. These findings are consistent with previous results which indicate that alcohol consumption is strongly linked to population factors such as cultures and countries^{22, 43}. The findings from this study indicated that younger caregivers aged 18 – 45 were more likely to engage in excessive alcohol consumption; however, findings from recent studies indicate that higher percentages of high-frequency drinking are found in older age groups in high-income countries^{44, 45}. Therefore, it is possible that the effect of providing informal care is contributing to the increased rates of self-reported hazardous alcohol consumption among younger caregivers. Caregivers who lived in the USA reported significantly less hazardous alcohol consumption than caregivers in Australia; however, even these rates are almost double what is reported in the USA general population⁴⁶. Therefore, these results indicate that providing informal care may influence engagement in hazardous alcohol consumption in addition to differences in country and societal factors. Possible causes for the high rates of alcohol consumption in our study population may be drinking behaviour as a coping strategy. Previous research has shown that some informal caregivers have increased their alcohol intake since taking on caregiving responsibilities^{41, 42}. Previous research has also found that caregiver burden is associated with hazardous alcohol consumption⁴⁷. Therefore, caregivers may be placing themselves at risk of experiencing alcohol-related health consequences as a result of greater alcohol consumption. Further qualitative research might help to understand the reasons for high alcohol consumption among carers, especially among younger caregivers and caregivers in Australia.

In this sample, participant factors were not found to be significantly associated with engaging in low fruit and vegetable consumption, low physical activity and smoking. Recommended physical activity was very infrequent in this sample, as 99% of participants reported low levels of moderate and vigorous physical activity as reported by the GLTEQ³¹. Furthermore, rates of physical activity in the general population are low⁴⁸. Current smokers were a small proportion of the sample population across countries and care conditions, and were comparable to the percentage of smokers in the general population of the five high-income countries⁴⁹⁻⁵². Of participants in this sample, just under 5% met the dietary guidelines for adequate fruit and vegetable consumption. This rate is similar to the general population in

Australia⁵³, and the USA⁵⁴. Current smokers were a small proportion of the sample population across countries and care conditions, and were comparable to the percentage of smokers in the general population of the five high-income countries⁴⁹⁻⁵².

Low fruit and vegetable consumption and low physical activity appears to be an issue that needs to be addressed in the general population across high-income English speaking countries, in addition to further supporting vulnerable groups such as informal caregivers to achieve healthier lifestyles. Informal caregivers are a vulnerable population which is known to have a lowered amount of free time and autonomy to engage in health-promoting practices such as physical activity^{11, 36, 37}. Possible further explanations for these rates in our sample were that caring responsibilities are often physically and mentally demanding, in addition to being restrictive on time for caregivers to engage in self-care activities such as exercise. Further research investigating the similarities and differences into the engagement in health risk behaviours among caregivers and non-caregivers could provide further insight into the individual factors that influence, enable and act as barriers to achieving healthier lifestyles.

Practical Implications

This data provide a profile of the health risk behaviours of informal caregivers across many caregiving groups and countries, and further provides insights into identifying priority areas for interventions, support and assistance for informal caregivers. Directions for future research include using this evidence in the development of technologies and programs to assist informal caregivers, and in turn increase the health and well-being of the people that they care for.

Healthy lifestyle promotion must be integrated into the development of support services and programs for informal caregivers to support wellbeing and reduce the risk of chronic disease and decline in physical and mental health. Outcomes of these programs and services should aim to increase health, well-being and quality of life in informal caregivers across countries and care conditions. Interventions to address health risk behaviours may need to specifically target informal caregivers and should not be considered in isolation from their broader population and individual factors such as culture, country, and socioeconomic characteristics.

Strengths and Limitations

A strength of this study was the use of the same measures across care conditions from multiple countries to investigate and compare health risk factors. Measuring the health

outcomes across countries allowed the identification that country of residence is associated with differences in engagement in hazardous alcohol consumption. Furthermore, as the care condition was not associated with engaging in health risk behaviours, this provides evidence that support developed from this research may be generalised across care conditions. Additionally, tailored support may also be developed for groups which were found to have higher associations with increased alcohol consumption, such as caregivers aged 18-45 years and caregivers who reside in Australia.

A limitation is the lack of a sampling frame, and the difficulty in assessing the effectiveness of the online recruitment strategy and generalisability of the study findings. As social media and Facebook were used as the primary recruitment tool, this is likely to result in a selective sample which may for example have excluded caregivers who do not use the internet and/or specific online platforms. Furthermore, as the survey was an open survey using an Anonymous Approach, therefore it was not possible to ensure people did not respond multiple times; however, one key benefit of using this approach in health research are that response rates are maximised during recruitment, thus increasing the external validity of the results⁵⁵. Upon manual validity checking of the timing results from the survey data by AMJD, no completed surveys were “flagged” as suspicious in terms of time to complete. Additionally previous research has shown that when reimbursements such as a chance to win a prize or cash reimbursements are used, this increases the chances that the survey will be completed multiple times^{56, 57}. As the timing of the responses aligned with the expectation of time taken to complete the survey, and the participants who completed this survey were volunteering their time, the researchers involved in the study are confident that the responses of the survey are valid and represent the study sample. The benefits of using Facebook include reduced cost, shorter recruitment periods, increased geographic and international reach to potential participants, and improved participant selection in young and hard-to-reach demographics^{58, 59}. Future studies should consider assessing the effectiveness of online recruitment in comparison to traditional recruitment methods.

This study targeted high-income countries and the study materials were only available in English, therefore these results may not be generalizable to other countries. Future research should focus on examining the differences in supports and systems of care within and between middle- and lower-income countries in addition to more developed countries to create an international profile of the health risk behaviours of informal caregivers.

A further limitation is the effect of possible measurement bias in our ability to draw conclusions about the health risk behaviours in the study. For example, the survey used Australian materials and guidelines to assess health risk behaviours: when answering the AUDIT-C³⁵, a standard drink is defined as 10g of alcohol in line with Australian standards⁶⁰. It is possible that these results may have underestimated the number of caregivers who engage in extremely hazardous drinking behaviour, as only one main country surveyed (the UK) had guidelines which defined less alcohol per standard drink than the Australian guidelines (8g vs 10g). Therefore, the results of this study may underestimate the proportion of caregivers who engage in health risk behaviours; however, the study still provides a useful indication of health risk behaviours of caregivers, and priority areas for interventions.

Conclusions

Informal caregivers are engaging in health risk behaviours which have the potential to impact their physical and mental health. In particular, we found high rates of hazardous alcohol consumption compared to prior published rates for the general population. Further qualitative research should also be conducted to investigate the unique challenges and/or impact that providing care has on their ability to engage in a healthy lifestyle, and how to support healthier behaviour. As this may vary by age group and country, such research should be conducted with consideration given to these influences on behaviour. This research provides direction for the next steps to support informal caregivers, such as engaging directly with informal caregivers to develop co-designed resources, programs and interventions to promote healthier lifestyles and increase well-being.

References

1. International Alliance of Carer Organizations. Global Carer Facts 2015 [Available from: http://www.internationalcarers.org/carers-facts/global-carer-stats/#_ednref4.
2. International Alliance of Carer Organizations. Global State of Care. 2018.
3. Adelman RD, Tmanova LL, Delgado D, Dion S, Lachs MS. Caregiver burden: a clinical review. *Jama*. 2014;311(10):1052-60.
4. Deloitte Access Economics. The economic value of informal care in Australia in 2015. 2015.
5. National Alliance for Caregiving and AARP. Caregiving in the United States 2009.; 2009.

6. Haley WE, Levine EG, Brown SL, Berry JW, Hughes GH. Psychological, social, and health consequences of caring for a relative with senile dementia. *Journal of the American Geriatrics Society*. 1987;35(5):405-11.
7. Anderson CS, Linto J, Stewart-Wynne EG. A population-based assessment of the impact and burden of caregiving for long-term stroke survivors. *Stroke*. 1995;26(5):843-9.
8. Ross A, Sundaramurthi T, Bevans M. A labor of love: the influence of cancer caregiving on health behaviors. *Cancer nursing*. 2013;36(6):474.
9. Greveson G, Gray C, French J, James O. Long-term outcome for patients and carers following hospital admission for stroke. *Age and Ageing*. 1991;20(5):337-44.
10. Vitaliano PP, Zhang J, Scanlan JM. Is caregiving hazardous to one's physical health? A meta-analysis. *Psychological bulletin*. 2003;129(6):946.
11. Beesley VL, Price MA, Webb PM, Group AOCS, Study AOC, Investigators QoLS. Loss of lifestyle: health behaviour and weight changes after becoming a caregiver of a family member diagnosed with ovarian cancer. *Supportive Care in Cancer*. 2011;19(12):1949-56.
12. Pinquart M, Sörensen S. Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis. *Psychology and aging*. 2003;18(2):250.
13. Gallant MP, Connell CM. The stress process among dementia spouse caregivers: Are caregivers at risk for negative health behavior change? *Research on aging*. 1998;20(3):267-97.
14. Schulz R, O'Brien AT, Bookwala J, Fleissner K. Psychiatric and physical morbidity effects of dementia caregiving: prevalence, correlates, and causes. *The gerontologist*. 1995;35(6):771-91.
15. Australian Institute of Family Studies. The nature and impact of caring for family members with a disability in Australia 2008 [Available from: <https://aifs.gov.au/publications/nature-and-impact-caring-family-members-di/10-empirical-findings-physical-health-carers>.
16. Khaw K-T, Wareham N, Bingham S, Welch A, Luben R, Day N. Combined impact of health behaviours and mortality in men and women: the EPIC-Norfolk prospective population study. *PLoS medicine*. 2008;5(1):e12.
17. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *Bmj*. 2004;328(7455):1519.

18. Griswold MG, Fullman N, Hawley C, Arian N, Zimsen SR, Tymeson HD, et al. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*. 2018;392(10152):1015-35.
19. Joshipura KJ, Hu FB, Manson JE, Stampfer MJ, Rimm EB, Speizer FE, et al. The effect of fruit and vegetable intake on risk for coronary heart disease. *Annals of internal medicine*. 2001;134(12):1106-14.
20. Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B. Depression, chronic diseases, and decrements in health: results from the World Health Surveys. *The Lancet*. 2007;370(9590):851-8.
21. Kagee A, Freeman M. Mental health and physical health (Including HIV/AIDS). 2008.
22. Kelly S, Olanrewaju O, Cowan A, Brayne C, Lafortune L. Alcohol and older people: A systematic review of barriers, facilitators and context of drinking in older people and implications for intervention design. *PloS one*. 2018;13(1):e0191189.
23. Bryant J, Bonevski B, Paul CL, Lecathelinais CL. A cross- sectional survey of health risk behaviour clusters among a sample of socially disadvantaged Australian welfare recipients. *Australian and New Zealand journal of public health*. 2013;37(2):118-23.
24. Frontline. Health Care Systems - The Four Basic Models 2009 [Available from: <https://www.pbs.org/wgbh/pages/frontline/sickaroundtheworld/countries/models.html>].
25. Rainville C, Skufca L, Mehegan L. Family caregiving and out-of-pocket costs: 2016 report. Report for the AARP Retrieved online at: https://www.aarp.org/content/dam/aarp/research/surveys_statistics/ltc/2016/family-caregiving-costsdoi1026419%252Fres00138001pdf. 2016.
26. The Australian Government: Department of Health. The Australian health system 2019 [Available from: <https://beta.health.gov.au/about-us/the-australian-health-system>].
27. Martin D, Miller AP, Quesnel-Vallée A, Caron NR, Vissandjée B, Marchildon GP. Canada's universal health-care system: achieving its potential. *The Lancet*. 2018;391(10131):1718-35.
28. National Health Service. National Health Service 2019 [Available from: <https://www.nhs.uk/>].
29. Australia Bureau of Statistics. National Health Survey: First Results 2014-15. (cat. no. 4364.0.55.001) 2015 [Available from: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.001~2014>].

30. National Health and Medical Research Council. Eat For Health: Australian Dietary Guidelines. Canberra; 2013.
31. Godin G, Shephard R. Godin leisure-time exercise questionnaire. *Med Sci Sports Exerc.* 1997;29(6):36-8.
32. Office of Disease Prevention and Health Promotion. Appendix 1. Translating Scientific Evidence About Total Amount and Intensity of Physical Activity Into Guidelines 2018 [Available from: <https://health.gov/paguidelines/guidelines/appendix1.aspx>.
33. Department of Health and Aged Care. An active way to better health. National physical activity guidelines for adults. 1999.
34. International Agency for Research on Cancer. IARC Handbook of Cancer Prevention, Vol. 12: Methods for Evaluating Tobacco Control Policies. Lyon: France.2008.
35. Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA. The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. *Archives of internal medicine.* 1998;158(16):1789-95.
36. Mochari-Greenberger H, Mosca L. Caregiver burden and nonachievement of healthy lifestyle behaviors among family caregivers of cardiovascular disease patients. *American Journal of Health Promotion.* 2012;27(2):84-9.
37. Rha SY, Park Y, Song SK, Lee CE, Lee J. Caregiving burden and health-promoting behaviors among the family caregivers of cancer patients. *European Journal of Oncology Nursing.* 2015;19(2):174-81.
38. StataCorp. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP; 2015.
39. Meader N, King K, Moe-Byrne T, Wright K, Graham H, Petticrew M, et al. A systematic review on the clustering and co-occurrence of multiple risk behaviours. *BMC public health.* 2016;16(1):657.
40. Buck D, Frosini F. Clustering of unhealthy behaviours over time. London: The Kings Fund. 2012:1-24.
41. Gallant MP, Connell CM. Predictors of decreased self-care among spouse caregivers of older adults with dementing illnesses. *Journal of Aging and Health.* 1997;9(3):373-95.
42. Connell CM. Impact of spouse caregiving on health behaviors and physical and mental health status. *American Journal of Alzheimer's Care and Related Disorders & Research.* 1994;9(1):26-36.

43. Sudhinaraset M, Wigglesworth C, Takeuchi DT. Social and cultural contexts of alcohol use: Influences in a social–ecological framework. *Alcohol research: current reviews*. 2016.
44. Chaikasong S, Huckle T, Mackintosh AM, Meier P, Parry C, Callinan S, et al. Drinking patterns vary by gender, age and country- level income: Cross- country analysis of the International Alcohol Control Study. *Drug and alcohol review*. 2018.
45. Gell L, Meier PS, Goyder E. Alcohol consumption among the over 50s: international comparisons. *Alcohol and alcoholism*. 2014;50(1):1-10.
46. Grant BF, Chou SP, Saha TD, Pickering RP, Kerridge BT, Ruan WJ, et al. Prevalence of 12-month alcohol use, high-risk drinking, and DSM-IV alcohol use disorder in the United States, 2001-2002 to 2012-2013: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *JAMA psychiatry*. 2017;74(9):911-23.
47. Rospenda KM, Minich LM, Milner LA, Richman JA. Caregiver burden and alcohol use in a community sample. *Journal of addictive diseases*. 2010;29(3):314-24.
48. Blackwell DL CT. State Variation in Meeting the 2008 Federal Guidelines for Both Aerobic and Muscle-strengthening Activities Through Leisure-time Physical Activity Among Adults Aged 18-64: United States, 2010-2015. *National Health Statistics Report*. 2018(112):1-22.
49. Australian Institute of Welfare and Health. National Drug Strategy Household Survey 2016: detailed findings. Canberra: AIHW; 2017.
50. Statistics Canada. Smoking, 2017. 2018.
51. NHS Digital. Statistics on Smoking - England , 2018. 2018.
52. Centers for Disease Control and Prevention. Smoking & Tobacco Use 2018 [Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/index.htm.
53. Australian Institute of Welfare and Health. Australia's health 2018: in brief. 2018.
54. Centers for Disease Control and Prevention. Disparities in State-Specific Adult Fruit and Vegetable Consumption — United States, 2015. 2017.
55. Eysenbach G, Wyatt J. Using the Internet for surveys and health research. *Journal of Medical Internet Research*. 2002;4(2):e13.
56. Konstan JA, Simon Rosser B, Ross MW, Stanton J, Edwards WM. The story of subject naught: A cautionary but optimistic tale of Internet survey research. *Journal of Computer- Mediated Communication*. 2005;10(2):00-.

- 1 57. Wright KB. Researching Internet-based populations: Advantages and disadvantages
2 of online survey research, online questionnaire authoring software packages, and web survey
3 services. *Journal of computer-mediated communication*. 2005;10(3):JCMC1034.
- 4 58. Kosinski M, Matz SC, Gosling SD, Popov V, Stillwell D. Facebook as a research tool
5 for the social sciences: Opportunities, challenges, ethical considerations, and practical
6 guidelines. *American Psychologist*. 2015;70(6):543.
- 7 59. Thornton L, Batterham PJ, Fassnacht DB, Kay-Lambkin F, Calex AL, Hunt S.
8 Recruiting for health, medical or psychosocial research using Facebook: systematic review.
9 *Internet Interventions*. 2016;4:72-81.
- 10 60. Australian Government DoH. Standard drinks guide 2010 [Available from:
11 <http://www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/drinksguide-cnt>.
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Table 1. Demographics of informal caregivers by country of residence (n=384)

	n (%)						
	Overall	Australia	Canada	New Zealand	United Kingdom	United States	Other
Overall sample	384 (100)	181 (47.14)	56 (15.58)	32 (8.33)	33 (8.59)	74 (19.27)	8 (2.08%)
Caregiver age (years) n=384							
18–45	88 (22.92)	41 (22.65)	7 (12.50)	8 (25.00)	7 (21.21)	21 (28.38)	4 (50.00)
45–65	218 (56.77)	104 (57.46)	34 (60.71)	20 (62.50)	22 (66.67)	36 (48.65)	2 (25.00)
65+	78 (20.31)	36 (19.89)	15 (26.79)	4 (12.50)	4 (12.12)	17 (22.97)	2 (25.00)
Caregiver gender n=384							
Male	54 (14.07)	27 (14.92)	4 (7.14)	2 (6.25)	4 (12.12)	14 (18.92)	3 (37.50)
Female	330 (85.93)	154 (85.08)	52 (92.86)	30 (93.75)	29 (87.88)	60 (81.08)	5 (62.50)
Caree condition n=384							
Alzheimer’s, dementia	66 (17.19)	24 (13.26)	10 (17.86)	6 (18.75)	10 (30.30)	13 (17.57)	3 (37.50)
Cancer	23 (5.99)	10 (5.52)	7 (12.50)	0 (0.00)	2 (6.06)	4 (5.41)	0 (0.00)
Mental/emotional illness	55 (14.32)	34 (18.78)	9 (14.29)	1 (3.13)	9 (27.27)	2 (2.70)	1 (12.50)
Mobility, physical disability	42 (10.94)	28 (15/47)	4 (7.14)	0 (0.00)	3 (9.09)	7 (9.46)	0 (0.00)
“Old age”, frailty	21 (5.47)	5 (2.76)	5 (8.93)	4 (12.50)	2 (6.06)	4 (5.41)	1 (12.50)
Stroke	71 (18.49)	26 (14.36)	10 (17.86)	7 (21.88)	3 (9.09)	23 (31.08)	2 (25.00)
Other	106 (27.60)	54 (29.83)	12 (21.43)	14 (43.75)	4 (12.12)	21 (28.38)	1 (12.50)
Caregiver education n=359							
Less than high school education	66 (18.38)	41 (24.40)	5 (9.62)	7 (21.88)	7 (23.22)	5 (7.25)	1 (12.50)

At least high school education	293 (81.62)	127 (75.60)	47 (90.38)	25 (78.13)	23 (76.67)	64 (92.75)	7 (87.50)
Caregiver marital status n=359							
Married	247 (68.80)	114 (67.86)	40 (76.92)	16 (50.00)	21 (70.00)	52 (75.36)	4 (50.00)
Other	112 (31.20)	54 (32.14)	12 (23.08)	16 (50.00)	9 (30.00)	17 (24.64)	4 (50.00)
Caregiver income n=359							
Low income	108 (30.08)	37 (22.02)	13 (25.00)	13 (40.63)	15 (50.00)	25 (36.23)	5 (62.50)
High/middle	158 (44.01)	88 (52.38)	23 (44.23)	15 (46.88)	6 (20.00)	23 (33.33)	3 (37.50)
Prefer not to answer	93 (25.91)	43 (25.60)	16 (30.77)	4 (12.50)	9 (30.00)	21 (30.43)	0 (0.00)
Caregiver main source of income n=358							
Work (either self-employed, full-time or part-time)	119 (33.24)	51 (30.36)	19 (37.25)	12 (37.50)	15 (50.00)	18 (26.09)	4 (50.00)
Government benefit or pension	161 (44.97)	82 (48.81)	24 (47.06)	13 (40.63)	9 (30.00)	29 (42.03)	2 (25.00)
Family members	37 (10.34)	12 (7.14)	5 (9.80)	3 (9.38)	2 (6.67)	14 (20.29)	1 (12.50)
Personal savings	40 (11.17)	21 (12.50)	2 (3.92)	2 (6.25)	2 (6.67)	7 (10.14)	1 (12.50)
Other	1 (0.28)	2 (1.19)	1 (1.96)	2 (6.25)	2 (6.67)	1 (1.45)	0 (0)
Caregiver employment Status n=359							
Full time or part time	121 (33.70)	54 (32.14)	19 (36.54)	11 (34.38)	16 (53.33)	17 (24.64)	4 (50.00)
Full-time unpaid caregiver	124 (34.54)	72 (42.26)	8 (15.38)	16 (50.00)	4 (13.33)	24 (34.78)	1 (12.50)
Retired	85 (23.68)	31 (18.45)	18 (36.54)	4 (12.50)	6 (20.00)	23 (33.33)	2 (25.00)
Student	10 (2.79)	5 (2.98)	1 (1.92)	0 (0)	1 (3.33)	2 (2.90)	1 (12.50)
Other	19 (5.29)	7 (4.17)	5 (9.62)	1 (3.13)	3 (10.00)	3 (4.35)	0 (0)

Years spent caregiving to caree n=359

Less than 1 year	24 (6.69)	5 (2.98)	4 (7.69)	4 (12.50)	2 (6.67)	8 (11.59)	1 (12.50)
1 – 5 years	138 (38.44)	60 (35.71)	16 (30.77)	12 (37.50)	15 (50.00)	31 (44.93)	4 (50.00)
5 – 10 years	74 (20.61)	36 (21.43)	14 (26.92)	7 (21.88)	5 (16.67)	9 (13.04)	3 (37.50)
More than 10 years	123 (34.26)	67 (39.88)	18 (34.62)	9 (28.13)	8 (26.67)	21 (30.43)	0 (0)

Relationship with caree n=359

Spouse/partner	153 (42.62)	69 (41.07)	28 (53.85)	8 (25.00)	8 (26.67)	38 (55.07)	2 (25.00)
Family member	192 (53.48)	91 (54.17)	24 (46.15)	23 (71.88)	22 (73.33)	27 (39.13)	5 (62.50)
Other	14 (3.90)	8 (4.76)	0 (0)	1 (3.13)	0 (0)	4 (5.80)	1 (12.50)

Caree age n=359

Younger than 18	59 (16.43)	36 (21.43)	6 (11.54)	8 (25.00)	6 (20.00)	3 (4.35)	0 (0)
18–65	132 (36.77)	68 (40.48)	15 (28.85)	6 (18.75)	8 (26.67)	34 (49.28)	1 (12.50)
65+	168 (46.80)	64 (38.10)	31 (59.62)	18 (56.25)	16 (53.33)	32 (46.38)	7 (87.50)

Caree gender n=359

Male	202 (56.27)	89 (52.98)	38 (73.08)	14 (43.75)	17 (56.67)	39 (56.52)	6 (62.50)
Female	145 (40.39)	2 (74.05)	14 (26.92)	16 (50.00)	13 (43.33)	25 (36.23)	3 (37.50)
Other	12 (3.34)	5 (2.98)	0 (0)	2 (6.25)	0 (0)	5 (7.25)	0 (0)

Live with caree n=359

Yes	291 (81.06)	139 (82.74)	36 (69.23)	30 (93.75)	18 (60.00)	64 (92.75)	4 (50.00)
No	68 (18.94)	29 (17.26)	16 (30.77)	2 (6.25)	12 (40.00)	5 (7.25)	4 (50.00)

†Note: differences in variable n are due to missing data

Table 2. Self-reported health risk behaviours of informal caregivers by caregiver group (n=384)

	n(%)							
	Overall	Alzheimer's, dementia	Cancer	Mental/emotional illness	Mobility, physical disability	“Old age”, frailty	Stroke	Other
Fruit and vegetable consumption n=384								
Recommended fruit and vegetable consumption	17 (4.43)	3 (4.55)	0 (0)	3 (5.45)	1 (2.38)	2 (9.52)	3 (4.23)	5 (4.72)
Low fruit and vegetable consumption	367 (95.57)	63 (95.45)	23 (100)	52 (94.55)	41 (97.62)	19 (90.48)	68 (95.77)	101 (95.28)
Physical activity n=354								
Recommended physical activity	2 (0.56)	1 (1.54)	0 (0)	0	1 (2.70)	0 (0)	0 (0)	0
Low physical activity	354 (99.44)	64 (98.46)	21 (100)	55 (100)	36 (97.30)	18 (100)	58 (100)	100 (100)
Smoking n=378								
Current smoker	47 (12.43)	8 (12.31)	6 (28.57)	10 (18.18)	4 (9.76)	2 (10.00)	5 (7.04)	12 (11.43)
Never smoker	233 (61.64)	42 (64.62)	13 (61.90)	31 (56.10)	23 (56.10)	11 (55.00)	45 (63.38)	68 (64.76)
Ex-smoker	98 (25.93)	15 (23.08)	2 (9.52)	14 (25.45)	14 (34.15)	7 (35.00)	21 (29.58)	25 (23.81)
Alcohol consumption n=377								
Safe levels of alcohol consumption	151 (40.05)	25 (38.46)	8 (40)	21 (38.18)	16 (39.02)	8 (40)	27 (38.03)	46 (43.81)

Hazardous levels of alcohol consumption	226 (59.95)	40 (61.54)	12 (60)	34 (61.82)	25 (60.98)	12 (60)	44 (61.97)	59 (56.19)
Health risk behaviours engaged in n=351								
One behaviour	6 (1.71)	1 (1.56)	0 (0)	1 (1.82)	0 (0)	1 (5.56)	0 (0)	3 (3.00)
Two behaviours	129 (36.75)	23 (35.94)	6 (31.58)	18 (32.73)	13 (35.14)	6 (33.33)	24 (41.38)	39 (39.00)
Three behaviours	193 (54.99)	35 (54.69)	10 (52.63)	30 (54.55)	23 (62.16)	11 (61.11)	33 (56.90)	51 (51.00)
Four behaviours	23 (6.55)	5 (7.81)	3 (15.79)	6 (10.91)	1 (2.70)	0 (0.00)	1 (1.72)	7 (7.00)

†Note: differences in n are due to missing data

Table 3. Self-reported health behaviours of informal caregivers by country of residence (n=384)

	n (%)						
	Overall	Australia	Canada	New Zealand	United Kingdom	United States	Other
Fruit and vegetable consumption							
n=384							
Recommended fruit and vegetable consumption	17 (4.43)	11 (6.08)	1 (1.79)	2 (6.25)	3 (9.09)	0 (0)	0 (0)
Low fruit and vegetable consumption	367 (95.57)	170 (93.92)	55 (98.21)	30 (93.75)	30 (90.91)	74 (100)	8 (100)
Physical activity n=354							
Recommended physical activity	2 (0.56)	1 (0.57)	0 (0)	0 (0)	0 (0)	1 (1.85)	0 (0)
Low physical activity	352 (99.44)	173 (99.43)	55 (100)	32 (100)	32 (100)	53 (98.15)	7 (100)
Smoking n=378							
Current smoker	47 (12.43)	21 (11.80)	6 (10.91)	3 (9.38)	4 (12.12)	11 (15.28)	2 (25.00)
Never smoker	233 (61.64)	102 (57.30)	40 (72.73)	19 (59.38)	24 (72.73)	43 (59.72)	5 (62.50)
Ex-smoker	98 (25.93)	55 (30.90)	9 (16.36)	10 (31.25)	5 (15.15)	18 (25.00)	1 (12.50)
Alcohol consumption n=377							
Safe levels of alcohol consumption	151 (40.05)	68 (38.20)	26 (48.15)	11 (34.38)	9 (27.27)	34 (47.22)	3 (37.50)
Hazardous levels of alcohol consumption	226 (59.95)	110 (61.80)	28 (51.85)	21 (65.63)	24 (72.73)	38 (52.78)	5 (62.50)
Health risk behaviours engaged in							
n=351							

One behaviour	6 (1.71)	4 (2.31)	1 (1.89)	1 (3.13)	0 (0.00)	0 (0.00)	0 (0.00)
Two behaviours	129 (36.75)	60 (34.68)	23 (43.40)	11 (34.38)	10 (31.25)	22 (40.74)	3 (42.86)
Three behaviours	193 (54.99)	97 (56.07)	26 (49.06)	17 (53.13)	20 (62.50)	30 (55.56)	3 (42.86)
Four behaviours	23 (6.55)	12 (6.94)	3 (5.66)	3 (9.38)	2 (6.25)	2 (3.70)	1 (14.29)

†Note: differences in variable n are due to missing data

Table 4. The adjusted self-reported socioeconomic, disease-related and country related factors associated with smoking status and alcohol use

	Smoking status			Alcohol use		
	n (%) yes	Odds Ratio (CI)	p	n (%) yes	Odds Ratio (CI)	p
Caregiver age (years)			0.259			0.018
18–45	15 (17.65)	2.39 (0.84, 6.79)	0.101	57 (67.06)	3.78 (1.50, 9.50)	0.005
45–65	26 (12.09)	1.75 (0.67, 5.54)	0.250	125 (58.41)	1.60 (0.83, 3.10)	0.160
65+	6 (7.69)	1		44 (56.41)	1	
Caregiver gender						
Female	39 (82.98)	1		196 (86.73)	1	
Male	8 (17.02)	0.80 (0.33, 1.97)	0.629	30 (13.27)	1.44 (0.62, 3.33)	0.391
Caregiver education		-				
Less than high school	-	-	-	36 (16.59)	1	
At least high school	-	-	-	181 (83.41)	1.54 (0.74, 3.19)	0.250
Marital Status		-	-			
Married	-	-	-	148 (68.20)	1	
Other	-	-	-	69 (31.80)	1.00 (0.52, 1.94)	0.990
Income		-	-			0.504
Low	-	-	-	57 (26.27)	1	
High/middle	-	-	-	98 (35.16)	1.45 (0.71, 2.96)	0.309
Prefer not to answer	-	-	-	62 (28.57)	1.51 (0.71, 3.21)	0.286
Caree condition						0.800
Alzheimer's, Dementia	-	-		40 (18.35)	1	

Cancer	-	-	-	12 (5.50)	0.79 (0.23, 2.76)	0.714
Mental/emotional illness	-	-	-	53 (24.31)	0.76 (0.33, 1.77)	0.528
Mobility, physical disability	-	-	-	57 (26.15)	1.28 (0.48, 3.42)	0.624
“Old age”, frailty	-	-	-	12 (5.50)	0.60 (0.19, 1.87)	0.375
Stroke	-	-	-	44 (20.18)	1.16 (0.52, 2.58)	0.723
Country of residence			-			0.015
Australia	21 (46.67)	1		110 (49.77)	1	
Canada	6 (13.33)	0.99 (0.36, 2.63)	0.992	28 (12.67)	0.57 (0.26, 1.25)	0.161
New Zealand	3 (6.67)	0.75 (0.21, 2.68)	0.653	21 (9.50)	2.03 (0.58, 7.16)	0.286
United Kingdom	4 (8.89)	0.99 (0.32, 3.12)	0.990	24 (10.86)	2.46 (0.82, 7.43)	0.109
United States	11 (24.44)	1.35 (0.61, 2.98)	0.463	38 (17.19)	0.45 (0.21, 0.96)	0.038

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Title:

An online cross-sectional survey of the health risk behaviours among informal caregivers.

Date:

2020-09

Citation:

Denham, A. M. J., Wynne, O., Baker, A. L., Spratt, N. J., Turner, A., Magin, P., Palazzi, K. & Bonevski, B. (2020). An online cross-sectional survey of the health risk behaviours among informal caregivers.. Health Promot J Austr, 31 (3), pp.423-435. <https://doi.org/10.1002/hpja.296>.

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