Title: Is planning for driving cessation critical for the well-being and lifestyle of older drivers?

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Abstract

Background: Driving cessation has demonstrated impacts on well-being and lifestyle. Despite the recognised reluctance of older people to plan for driving cessation, this study has identified a new group who have a stated plan to stop driving within twelve months. Although gradual reduction of driving has been documented as part of the usual driving cessation, this study explored the differences between retired drivers and those with a stated plan to retire within 12 months in sociodemographic, well-being and lifestyle outcomes.

Methods: This study extracted all baseline data from a clinical trial exploring the effectiveness of a group program for older retiring and retired drivers. Sociodemographic data included age, gender, health status, educational level and living situation. All participants completed measures related to episodes away from home, well-being and lifestyle. These were compared using parametric and non-parametric statistical analysis.

Results: Participants (n = 131) included 68 retired drivers (mean age 79.8 years) and 63 retiring drivers (mean age 77.8 years). Retiring drivers engaged in more episodes away from home (p = 0.03), and more social activities (p = 0.02), used less alternative transport (p < 0.0001), displayed fewer anxiety (p = 0.05) and depressive (p = 0.01) symptoms, but demonstrated lower transport and lifestyle self-efficacy (p = 0.04).

Conclusion: Both retired and retiring drivers require support for driving cessation and community engagement. Retiring drivers may be in a critical position to engage in driving cessation interventions to improve self-efficacy and begin adapting community mobility.

Keywords

community mobility , alternative transport, depression, anxiety, self-efficacy.

Introduction

Many societies throughout the world are heavily dependent on automobiles as the predominant means of transportation (Buys et al., 2012). The ageing process and health conditions more common in older age may lead to impairments which affect an individual's ability to drive safely. As a result, older people often decide or are advised to reduce or cease driving activities, due to health or financial reasons, or discomfort with driving (Byles and Gallienne, 2012; Liddle et al., 2012). Driving cessation may negatively impact the older person in terms of changes to well-being and lifestyle (Edwards et al., 2009). There is a large body of evidence that compares those who have already ceased driving (retired drivers) with those who are still driving (current drivers), documenting the adverse psychosocial effects associated with driving cessation. Increased depressive symptoms (Marottoli et al., 1997; Windsor et al., 2007), reduced life satisfaction (Liddle et al., 2012), and social isolation (Lister, 1999) are psychosocial issues commonly reported by older retired drivers when compared to older current drivers. These psychosocial changes may stem from a loss of independence, a lack of personal control, and reduced participation in important life roles, all of which have been linked to driving cessation (Liddle et al., 2012; Ragland et al., 2005; Windsor et al., 2007). Together, these consequences may lead to uncertainties in personal identity which can have major implications on an individual's self-esteem, psychological state and well-being (King et al., 2011; Liddle et al., 2008).

Driving cessation can also alter the older person's lifestyle with studies showing that retired drivers have significantly reduced out of home activities when compared to current drivers, and as such have reduced community access (Curl et al., 2013; Liddle et al., 2012; Marottoli et al., 2000). Whilst studies have shown that the frequency with which retired drivers and current drivers attend non-discretionary activities such as medical appointments and grocery shopping are similar, there is evidence to suggest retired drivers are less likely to

attend discretionary activities such as social and leisure activities (Liddle et al., 2005). When leaving the home, retired drivers are more likely than current drivers to use other forms of transport such as public or community transport (Bartley and O'Neill, 2010); however there is still a heavy reliance on the use of private transportation (e.g. lifts from family and friends) (Buys et al., 2012). There is some suggestion that health issues associated with reasons for retiring from driving may make using alternative transport difficult and unsafe (Buys et al., 2012, Oxley and Whelan, 2008). Surveys of older drivers have shown that current drivers rely heavily on driving themselves and alternative transport is rarely used (Liddle et al., 2005). Participants in a study conducted by Buys and colleagues (2012) suggested that the physical demands associated with using public transport may make it difficult for the older individual to negotiate and therefore there is a continued reliance on private transportation. Large population-based studies have compared outcomes for older drivers and retired drivers (e.g., Marottoli et al., 1997; O'Connor et al., 2013). The studies have demonstrated that retired drivers have poorer outcomes in physical and mental health and community participation (Marottoli et al., 2000; Marottoli et al., 1997; Ragland et al., 2005). They have also indicated that driving cessation is predictive of morbidity, residential care admission and mortality for older people, even when allowing for age, health, and frailty indicators (e.g., Edwards et al., 2009b; Freeman et al., 2006). With the acknowledgement of the outcomes associated with driving cessation, longitudinal examination of population data has been used to attempt to predict who will cease driving, and which factors may mediate poor outcomes related to driving cessation (e.g., Edwards et al., 2008; O'Connor et al., 2013). Longitudinal examination of driving cessation has indicated gender, education, and racial disparities between older people who continue driving and those who cease driving (Choi et al., 2012). An understanding of the process of driving cessation is also beginning to emerge. Longitudinal population data suggests that older drivers gradually decrease their distance and

frequency of driving prior to stopping for a variety of reasons (Molnar et al., 2013). As studies have also indicated a reluctance to use alternative transportation and a reduced participation in community based activities, there is a focus on how to promote better outcomes related to driving cessation (Molnar et al., 2008).

In addition to the well documented well-being and lifestyle changes associated with driving cessation, there is research that describes older people's reluctance to plan for driving cessation or engage in discussions about the issue, especially for current drivers (Meuser et al., 2013; Yassuda, Wilson, and von Mering, 1997). Gerontological research has characterized the process of driving cessation as a life transition, whereby people may gradually change their transportation, community mobility and acceptance. It has been noted that older drivers may be reluctant to engage in planning due to their awareness of the potentially negative outcomes of driving cessation and a lack of readiness to engage in the necessary behavioural and identity changes (King et al., 2011). Assessment of the aspects of readiness for the transition in mobility have indicated an impact of anticipatory anxiety, perceptions and concerns about being dependent, perceptions of a major negative impact to quality of life and resistance to engage in discussion or planning about changes to mobility (Meuser et al., 2013). Planning for a major life change like driving cessation might be expected to improve the outcomes through better gradual preparation and maintenance of control (Buys et al., 2012; Liddle and McKenna, 2003). However, for older people who are reluctant to plan, this transition may be quite complicated (Berg-Weger et al., 2013; Meuser et al., 2013).

The individualized nature of the driving cessation process suggests that older people facing driving cessation may need support based on their individual readiness for the transition in their mobility (Berg-Weger et al., 2013; Meuser et al., 2013). A qualitative study has

identified four phases of driving cessation – driving in the past, predecision, decision and post-cessation phases – indicating that some older people make careful, purposeful decisions to cease driving (Liddle et al., 2008). Those older people who are still driving and have made the decision to cease in the near future are termed "retiring drivers". A recent large trial of a group program for older drivers facing driving cessation (Liddle et al., 2013) has identified a group of older drivers who are actively planning for when they stop driving. This group of older people have made a definitive decision to cease driving in the near future (retiring drivers) and had sought education and support by attendance at a group program. Previous literature have reported comparisons of current and retired drivers but the retiring group of drivers have not been clearly identified in previous studies. The overall aim of this study was to understand the retiring drivers group in comparison with retired drivers, while considering what is known about the differences between older drivers and retired drivers. It sought to explore whether the general pattern of gradual reduction then cessation of driving found for older drivers is accompanied by changes to transport behaviors, well-being, and beliefs about driving cessation. It also sought to determine whether the self-identified retiring drivers were a unique subgroup of older drivers who differed fundamentally from retired drivers, or represented a stage of adjustment in lifestyles prior to driving cessation. Therefore, the purpose of this study was to directly compare the sociodemographic characteristics and, well-being and lifestyle status of retiring drivers with the retired drivers. The specific research questions were:

1. Do retiring drivers differ from retired drivers on sociodemographic characteristics?

2. Do retiring drivers demonstrate different patterns of use of transport when compared with retired drivers?

3. Do retiring drivers differ from retired drivers on well-being and lifestyle outcomes?

Method

Ethical considerations

This study obtained ethical approval from the Behavioural and Social Sciences Ethical Review Committee (human subject approval number 2007000821) at the University of Queensland. Before participating in the initial stages of this study, written informed consent was obtained from participants. The data used in the current study is comprised of baseline data collected from a randomized controlled trial (RCT) examining the effectiveness of an education and support program for retired and retiring drivers (UQDRIVE) (Liddle et al., 2013).

Participants

Participants consisted of people aged 60 years and over who were living independently in the community. Inclusion criteria stated that participants were required either to be retired from driving or planning to retire from driving within the next twelve months; able to provide written, informed consent; and have a Short Portable Mental Status Questionnaire (SPMSQ) score greater than seven so as to rule out cognitive impairment (Pfeiffer, 1975). Eligible participants needed to be able to communicate sufficiently in English in order to participate in a group intervention and complete the outcome measures. The RCT recruited 131 participants and their baseline data have been used for this study and analysis. The participants included 68 who had already retired from driving and 63 who identified themselves as planning to retire.

Procedure

Participants were invited to participate in the UQDRIVE program which involved an education and support group program run over six weeks (Liddle et al., 2007). Potential

participants from the community were encouraged to make contact with the research team to express an interest and eligibility was determined at this initial contact. Initial data collection (baseline measures) were performed in South East Queensland from 2008 to 2010 and conducted during face-to-face interviews at the person's home.

Measures

Sociodemographic information. Descriptive information was collected from all participants at baseline and included driving status, age, gender, educational status, current residence, living situation and marital status.

Well-being outcomes

Mood. The *Geriatric Anxiety Inventory (GAI)* (Pachana et al., 2007) includes 20 questions which assess the presence of anxiety symptoms among older people during the previous week. Answers to the questions are dichotomized into "agree" or "disagree". Examples include, "Do you think of yourself as a nervous person?" and "Do you find it hard to relax?" A score on the GAI of nine or above indicates clinical levels of anxiety (Pachana et al., 2007). This tool has been shown to have excellent test-retest and inter-rater reliability as well as well-established validity (Pachana et al., 2007). The *Geriatric Depression Scale* (Sheikh and Yesavage, 1986) was used to identify symptoms of depression in the current study. This scale includes fifteen questions with either "yes" or "no" responses. Examples include, "Do you feel happy most of the time?" and "Do you feel helpless?". For clinical purposes, a score of five or greater suggests depression and requires further investigation (Almeida and Almeida, 1999). This test has well-established validity and reliability when evaluated against other diagnostic criteria (Sheikh and Yesavage, 1986).

Self-efficacy. The *Transport and Lifestyle Self-efficacy Questionnaire* was adapted from Lorig et al. (1996) Chronic Disease Self-efficacy Scale for the purposes of the trial. Statements related to transport and lifestyle issues were used to measure how confident a

participant felt with participating in life roles and activities without driving. For example, "How confident do you feel about being able to stay involved in the community without driving?" and "How confident do you feel about being able to stay in contact with friends and family without driving?" This questionnaire assessed participants' level of confidence on a ten-point scale ranging from one, not confident at all, to ten, very confident, with five indicating neither confident nor not confident. Cronbach's alpha was calculated for data collected using this scale in the clinical trial and was 0.91 indicating a high level of internal consistency. This transport and lifestyle self-efficacy questionnaire was successfully trialled in a pilot study (Liddle et al., 2005).

Lifestyle outcomes

Episodes away from home and modes of transport used in the previous week. Participants were interviewed about the activities of their previous week. They were encouraged to use a diary or calendar to accurately recall occasions in which they left the home (episodes away from home), the reason for the trip and the mode of transport used, over the previous week.

Community activities and modes of transport used. The interviewer asked questions relating to the frequency with which the older person attended community activities such as medical appointments, grocery shopping and social and leisure activities, and modes of transport used. For example, one of the frequency questions was "How often do you access medical appointments?" Responses were daily or several times a week, less often than weekly, less often than monthly, and rarely or never. Each frequency question was then accompanied with an open ended question such as "How do you access (activity)?"

Analysis

Analysis employed a number of approaches depending on the type and distribution of data. Participants were divided according to their driving status (retiring or retired drivers) and these groups were compared statistically on sociodemographic characteristics, episodes away from home, frequency of attending community activities, modes of transport used, alternative transport used, anxiety, depression and self-efficacy. A two-sample t-test with equal variances was used for age and episodes away from home as they were normally distributed. Non-parametric analysis, Mann-Whitney U test, was used for frequency of modes of transport used, presence of anxiety and depressive symptoms, and self-efficacy as they were not normally distributed (Utts and Heckard, 2012). All other sociodemographic characteristics (other than age), frequency of attending community activities and alternative transport use were dichotomized and Pearson Chi^2 analyses were conducted where possible. However where the expected frequency of a cell was below five, a non-parametric test (Fisher's exact) was used (Utts and Heckard 2012). STATA Statistical Data Analysis Special Edition 10.0 was used to conduct data analysis.

Results

Sociodemographic Outcomes

The baseline sociodemographic characteristics and results of comparisons for the two groups of participants are outlined in Table 1. The retired drivers *(n* = 68*)* were a mean age of 79.78 (SD = 7.40) years and the retiring (*n* = 63*)* were a mean age of 77.84 (SD = 7.40) years. Retiring drivers had significantly lower levels of educational attainment than the retired drivers ($p = 0.04$).

Additional information about the driving cessation process was collected from retired drivers. This identified that they were a median age of 76.12 (IQR = 72.00-83.00) years when they ceased driving. They reported that they had ceased driving due to a range of reasons (multiple responses allowed) including health (53%), discomfort (22%), licensing body or

health professionals' orders (13%), family pressure (7%), the financial cost associated with owning a car (6%) and other (25%), which included multifaceted reasons not adequately described by the other categories such as "moved to a retirement village, did not feel comfortable driving a car in the new location, and the new location did not have a garage". Finally, the retired drivers indicated that their decision to cease driving involved themselves (87%), a doctor (35%), family (24%), friends (1%), and other (1%). Again, participants could give multiple answers. No comparable data were available for retiring drivers.

Insert Table 1 around here

Well-being outcomes

The well-being outcome measures examined the differences between retiring and retired drivers in regards to anxiety symptoms, depressive symptoms and transport and lifestyle self-efficacy (Table 2). Analysis from the Mann-Whitney U test indicated that retired drivers had significantly more depressive symptoms ($p = 0.01$) and anxiety ($p = 0.05$), yet had a significantly greater sense of transport and lifestyle self-efficacy ($p = 0.04$).

Insert Table 2 around here

Lifestyle outcomes

Episodes away from home and modes of transport used. Retiring drivers had significantly ($t(129) = -2.14$, $p = 0.03$) more mean episodes away from home (5.30, SD = 2.48) than retired drivers (4.31, SD = 2.79). Fishers Exact analysis showed retired drivers were significantly more likely to use alternative transport during these episodes away from home ($p < 0.0001$). Alternative transport use refers to using modes of transport other than driving self, including catching public transport, walking, getting a lift from family or friends, using community transport, or catching a taxi.

Analysis of modes of transport used with the Mann-Whitney U test found that retired drivers were significantly more likely to walk ($z = 2.30$, $p = 0.02$), catch a bus ($z = 2.017$, $p =$

0.04), catch a taxi ($z = 4.23$, $p < 0.0001$), use community transport services ($z = 2.51$, $p = 0.01$), or get a lift with friends/family ($z = 5.15$, $p < 0.001$) when leaving the home. The frequencies for each individual mode of transport used in the previous week are graphed in Figure 1.

Community activities and modes of transport used. The frequency with which an older person attended medical appointments, grocery shopping and social and leisure activities was measured. Table 3 outlines these frequencies of attendance as well as the use of alternative transport when comparing groups. Fishers exact test showed that retired drivers, who were significantly less likely ($p = 0.02$) to attend leisure or social activities. Although not significant, there was a trend for retiring drivers to attend grocery shopping more frequently ($p = 0.06$), however accessing medical appointments were similar between the two groups ($p = 0.90$). When looking at modes of transport used when attending these community activities, Fishers exact analysis showed retiring drivers were significantly less likely to use alternative modes of transport when accessing medical appointments ($p < 0.001$), grocery shopping ($p < 0.001$) and leisure and social activities ($p < 0.001$). The trend for modes of transport used for these community activities was similar to that displayed in Figure 1 where retired drivers reported a range of modes of transport used and retiring drivers predominantly drove themselves.

Insert Table 3 around here

Insert Figure 1 around here

Discussion

This is the first known study to investigate the sociodemographic characteristics, well-being and lifestyle status of retiring and retired drivers who self-selected to attend a community-based group program for driving cessation. The comparison indicated that retiring drivers leave the home more often, use a narrower range of transport modes and

report lower levels of transport related self-efficacy compared to retired drivers. Despite planning to cease driving, it seems that retiring drivers have not begun to change transport behaviors and do not seem confident in how well they will cope with adjustment to life without driving. This indicates that engagement in planning to cease driving may mark a critical time for intervention and support to facilitate a smoother transition to driving cessation.

The sociodemographic characteristics of participants were investigated for homogeneity of the groups and to allow for comparison with participants from other driving cessation studies. Participants for this study were volunteers recruited from the general community and accurately reflected the gender, age, education status, and health status described from other driving cessation studies (e.g. Ragland et al., 2005). In contrast to differences found between current and retired drivers in previous studies (e.g. Garre-Olmo et al., 2009; Ragland et al., 2005), the retiring and retired drivers of this study were similar in terms of age, gender, health status, current residence, living situation and marital status.

Previous literature has reported retired drivers to have a lower education than current drivers (e.g. Garre-Olmo et al., 2009), however in the current study a higher percentage of retired drivers had completed more than ten years of education compared to retiring drivers. This finding may be an artefact of the interventional nature of the study or the recruitment methods used. Participants responded to a call for participants and therefore needed to self-recognize a need for education and support. It is possible that educational attainment may influence the likelihood and timing of seeking help or alternatively having the resources to source the required assistance or transport in relation to driving cessation.

With respect to lifestyle status, retiring drivers reported significantly more episodes away from the home equating to one extra trip in the previous week. Liddle et al. (2005) reported a difference of 2.6 episodes away from home per week when comparing retired

drivers to current drivers. It is possible that retiring drivers may be reducing the amount of trips undertaken either in preparation for driving cessation, or as a result of the health and lifestyle issues which are prompting them to plan for driving cessation. The literature has described a number of implications associated with reduced number of episodes away from home, including increased depression, reduced life satisfaction, reduced engagement in valued roles, and social isolation (Liddle et al., 2012; Marottoli et al., 2000; Marottoli et al., 1997). Continued community engagement allows for greater social integration which has been linked to lower mortality and greater well-being in later life (Marattoli, et al., 2000). Therefore it is important for retiring drivers to maintain their current level of episodes away from home and active planning and support during this transition may play a key role in reducing these changes in lifestyle. Future research may investigate whether differences in driving cessation outcomes are found for those who have engaged in active planning compared to those who have not.

An unexpected finding was that although retired drivers had higher levels of depressive and anxiety symptomatology, as has been found in other studies (e.g. Windsor et al., 2007), they reported higher levels of self-efficacy in relation to transport and lifestyle. This group had adjusted to learning to use alternate transport. It is proposed that a group program may improve self-efficacy in relation to transport and lifestyle prior to cessation, with earlier adaption to transport behaviours and lifestyle. This improved self-efficacy may enhance the mobility and continued participation of people during and following the transition. In turn, this may reduce some of the loss of activity participation and social interaction which has been linked to driving cessation (Liddle et al., 2012; Marottoli et al., 2000). The impact of engagement or lack of engagement in planning, and support during planning requires further exploration to determine any impact this may have in long term health and wellbeing outcomes following driving cessation.

With the decrease in episodes away from home may also come a reduction in discretionary activities. Retired drivers, or those who support them, may perceive continued engagement in social and leisure activities as less necessary, and therefore reduced value is placed on these types of activities and fewer resources directed towards them. In the current study, retiring drivers attended leisure and social activities significantly more than retired drivers, further supporting that access to driving seems to allow easier participation in discretionary activities. Two-thirds of retired drivers relied on being driven by family or friends when attending leisure and social activities and as such may feel as though they are a burden. When unable to return a favor or show reciprocity, older adults may be less inclined to ask for lifts from family and friends to avoid inconveniencing others (Johnson, 2008), and therefore may not attend the activity. Reduced participation in leisure and social activities can lead to social isolation (Herrera et al., 2011), reduced happiness, and loss of important life roles (Menec, 2003). A related finding, that retired drivers had a trend towards less frequent grocery shopping trips, should be further investigated and supports made available for both discretionary and non-discretionary activities for those experiencing driving cessation.

When engaging in episodes away from home in general, just under half (48%) of those trips made by retired drivers involved private vehicles (i.e. driven by family or friends), as well as 85% of retiring drivers (including driving self). This suggests that there continues to be a heavy reliance on private transportation for both groups. There is a reluctance by older people to use alternative transport, in particular public transport, which may reflect a life time of habits and the easier physical access of using private transportation (Buys et al., 2012). Alternative transport, in particular public transport, tends to be viewed as inconvenient, unsafe and unacceptable (Buys et al., 2012; Curl et al., 2013; Liddle et al., 2005) and may therefore not be an easy transition for older people. It has been suggested however, that a combination of improving design and accessibility of the existing transport options, as well as

providing older people with education to increase awareness and acceptance of alternative transport may be required (Buys et al., 2012; Curl et al., 2013).

Whilst there was a heavy reliance on private transportation from both groups, retired drivers were significantly more likely to use alternative modes of transport when leaving the home. This may suggest that older people are only using alternative modes of transport such as public and community transport services, when they have no other options. If there is limited use of these alternative modes of transport prior to ceasing driving, then it may increase the adjustment that needs to take place once cessation has occurred. Therefore older people planning to retire from driving may need prompting and support to explore the use of alternative transport in order to ease into the transition. Actual use of alternative transport may support the higher self-efficacy reported by retired drivers, albeit a modest but significant difference. Higher self-efficacy has been linked to lower incidences of clinical depression and it is suggested that self-efficacy is strengthened by experiencing success (Blazer, 2002). Therefore, recent and successful use of alternative transport experienced by retired drivers may facilitate higher confidence and greater use of alternative options. Self-efficacy may be enhanced in retiring drivers through targeted education and support including facilitating experience with alternative transport prior driving cessation. The limited use of alternative transport suggests that retiring drivers have not substantially changed their transportation patterns in planning for driving cessation. They appear to have adapted mainly by reducing the overall number of trips but still relying on driving, when it would be preferable to maintain the overall number of trips and increase the range of alternative transportation used.

Limitations

The investigators acknowledge the limitations associated with the study. Where comparisons were made between retiring and current drivers, they are done so based on published literature. The participants of this study may not accurately reflect all retired and retiring drivers in the community. The older people who did participate were volunteers; people who had self-identified as needing support and were available and well enough to participate in the study. Additionally, participants needed to be able to communicate sufficiently in English for data collection and group participation. There was a propensity towards higher educational attainment for the retired driver group which has been discussed and which may have impacted the findings. The study was conducted in a largely metropolitan area with relatively good access to alternate transport. However, we did not measure all variables which may impact episodes out of home including the climate. The number of participants in the current study was relatively low and may be a limitation. At times data had non-normal distributions and, therefore, caution must be taken when generalizing to the wider population. The analysis in this study required multiple comparisons of related variables and therefore increases the likelihood of Type I errors. However, this was an exploratory study investigating outcomes for a group that have not been previously studied, so it was important to avoid Type II errors and, therefore, the significance level was set at 0.05 to enable emerging trends to be identified (Utts and Heckard, 2012).

Future Studies

The intervention delivered at later stages in the study (UQDRIVE) has indicated some effectiveness in improving community mobility outcomes for retired and retiring drivers (Liddle et al., 2013). The trial led to suggestions for making the group program more flexible and individualized to further improve outcomes (Liddle et al., 2013). Other driving cessation researchers have also suggested that the readiness for change and other individual factors be considered in providing support and intervention for people facing driving cessation (Berg-

Weger et al., 2013). Longitudinal studies monitoring an individual's mood and self-efficacy across the driving cessation process should be conducted to ascertain the impact of identifying a plan to cease driving and receiving support to do this on a transition to life without driving. Future studies should also include a range of geographic locations to understand their influence on the driving cessation process. Future research should also focus on following retiring drivers over time to determine the effectiveness of engaging in education and support over no engagement, along with the exploration of the process of driving cessation to determine how older people who identify as being a planner, engage in planning. The characteristics, qualities and experiences of retiring drivers could be more deeply explored through use of qualitative methodology.

Conclusion

In conclusion, both retiring and retired drivers may benefit from support and education to counteract the negative effects of driving cessation. Although retiring drivers were engaging more often in the community they reported significantly less transport self-efficacy. There was a heavy reliance within both groups to rely on private transportation. However retired drivers appeared to use alternative modes of transport more frequently than retiring drivers. The infrequent use of alternative transport and reduced self-efficacy despite continued engagement in the community implies that retiring drivers may be in a critical position to engage in education and support relating to driving cessation. Equally this study supports that retired drivers have reduced participation in social and leisure activities which may adversely impact mood, including anxiety and depression. It is therefore essential that continued attention be directed towards that education and support required to negate the effects of reduced participation in these types of activities.

Conflict of Interest

None

Description of Authors Roles

JL was involved in all aspects of the study design, implementation, statistical analysis and paper preparation. LG was involved in the study implementation, statistical analysis and paper preparation. NP was involved in the study design and implementation and edited the paper. GM was involved in the study design, assisted with data collection and edited the paper. TR extracted the data, conducted all statistical analyses and wrote the paper.

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References

Almeida, O .P. and Almeida, S. A. (1999). Short versions of the geriatric depression scale: a study of their validity for the diagnosis of a major depressive episode according to ICD-10 and DSM-IV. *International Journal of Geriatric Psychiatry, 14*(10), 858-865.

Bartley, M. and O'Neill, D. (2010). Transportation and driving in longitudinal studies on ageing. *Age and Ageing, 39*(5), 631-636.

Berg-Weger, M., Meuser, T. M. and Stowe, J. (2013). Addressing individual differences in mobility transition counseling with older adults. *Journal of Gerontological Social Work, 56*(3), 201-218. doi: 10.1080/01634372.2013.764374

Blazer, D. G. (2002). Self-efficacy and depression in late life: a primary prevention proposal. *Aging and Mental Health, 6*(4), 315-324. doi: 10.1080/1360786021000006938

Buys, L., Snow, S., van Megen, K. and Miller, E. (2012). Transportation behaviours of older adults: an investigation into car dependency in urban Australia. *Australasian Journal of Ageing, 31*(3), 181-186. doi: 10.1111/j.1741-6612.2011.00567.x

Byles, J. and Gallienne, L. (2012). Driving in older age: a longitudinal study of women in urban, regional, and remote areas and the impact of caregiving. *Journal of Women and Aging, 24*(2), 113-125. doi: 10.1080/08952841.2012.639661

Choi, M., Mezuk, B., Lohman, M. C., Edwards, J. D., and Rebok, G. W. (2012). Gender and racial disparities in driving cessation among older adults. Journal of Aging and Health, 24, 1364–1379. doi: 10.1177/0898264312460574

Curl, A. L., Stowe, J. D., Cooney, T. M. and Proulx, C. M. (2013). Giving Up the Keys: How Driving Cessation Affects Engagement in Later Life. *Gerontologist*. doi: 10.1093/geront/gnt037

Edwards, J. D., Ross, L. A., Ackerman, M. L., Small, B. J., Ball, K. K., Bradley, S., and Dodson, J. E. (2008). Longitudinal predictors of driving cessation among older adults from the ACTIVE clinical trial. Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 63B, P6–12.

Edwards, J. D., Lunsman, M., Perkins, M., Rebok, G. W. and Roth, D. L. (2009). Driving cessation and health trajectories in older adults. *Journals of Gerontology Series A: Biological Sciences & Medical Sciences, 64A*(12), 1290-1295.

Freeman, E.E., Gange, S.J., Munoz, B., and West, S. K. (2006). Driving status and risk of entry into long-term care for older adults. American Journal of Public Health, 96, 1254–1259.

Garre-Olmo, J., Pujol, X. P., Garriga, O. T., Lopez-Pousa, S. and Vilalta-Franch, J. (2009). Biopsychosocial differences between drivers and non-drivers over the age of 74. *Arch Gerontology and Geriatrics, 49*(3), 355-359. doi: 10.1016/j.archger.2008.11.012

Herrera, A. P., et al. (2011). Emotional and cognitive health correlates of leisure activities in older Latino and Caucasian women. *Psychology, Health, and Medicine, 16*(6), 661-674. doi: 10.1080/13548506.2011.555773

Johnson, J. E. (2008). Informal social support networks and the maintenance of voluntary driving cessation by older rural women. *Journal of Community Health Nursing, 25*(2), 65-72.

King, M. D., et al. (2011). Decoding the Miss Daisy Syndrome: an examination of subjective responses to mobility change. *Journal of Gerontological Social Work, 54*(1), 29-52. doi: 10.1080/01634372.2010.522231

Liddle, J., Gustafsson, L., Bartlett, H. and McKenna, K. (2012). Time use, role participation and life satisfaction of older people: Impact of driving status. *Australian Occupational Therapy Journal, 59,* 384–392. doi: doi: 10.1111/j.1440-1630.2011.00956.x

Liddle, J., et al. (2013). Effect of a Group Intervention to Promote Older Adults' Adjustment to Driving Cessation on Community Mobility: A Randomized Controlled Trial. *Gerontologist*. doi: 10.1093/geront/gnt019

Liddle, J. and McKenna, K. (2003). Older drivers and driving cessation. *British Journal of Occupational Therapy, 66*(3), 125-132.

Liddle, J., McKenna, K. and Bartlett, H. (2007). Improving outcomes for older retired drivers: The UQDRIVE program. *Australian Occupational Therapy Journal, 54*(4), 303-306.

Liddle, J., McKenna, K. and Broome, K. (2005). Older road users: From driving cessation to safe transportation. Canberra: Australian Transport Safety Bureau.

Liddle, J., Turpin, M., Carlson, G. and McKenna, K. (2008). The needs and experiences related to driving cessation for older people. *British Journal of Occupational Therapy, 71*(9), 379-388.

Lister, R. (1999). Loss of ability to drive following a stroke: The early experiences of three elderly people on discharge from hospital. *British Journal of Occupational Therapy, 62*, 514-520.

Lorig, K., et al. (1996). *Outcome measures for health education and other health care interventions.* California: Sage Publications.

Marottoli, R. A., et al. (2000). Consequences of driving cessation: Decreased out of home activity levels. *Journal of Gerontology: Social Sciences, 55*, 334-340.

Marottoli, R. A., et al. (1997). Driving cessation and increased depressive symptoms: Prospective evidence from the New Haven EPESE. *Journal of American Geriatrics Society, 45*, 202-206.

Menec, V. H. (2003). The relation between everyday activities and successful aging: a 6-year longitudinal study. *Journal of Gerontology B Psychological Science and Social Science, 58*(2), S74-82.

Meuser, T. M., Berg-Weger, M., Chibnall, J. T., Harmon, A. C. and Stowe, J. (2013). Assessment of Readiness for Mobility Transition (ARMT). A tool for mobility transition counselling with older adults. *Journal of Applied Gerontology., 32*(4), 484-507.

Molnar, L. J. et al. (2013). Driving avoidance by older adults: is it always self-regulation? Accident Analysis and Prevention, 57, 96–104. doi: 10.1016/j.aap.2013.04.010

Molnar, L. J., et al. (2008). Promising Approaches for Promoting Lifelong Community Mobility. Ann Arbor, MI, USA: Transport Research Institute, University of Michigan.

Oxley, J. and Whelan, M. (2008). It cannot be all about safety: The benefits of prolonged mobility. Traffic Injury Prevention, 9, 367–378.

O'Connor, M. L., Edwards, J. D., Waters, M. P., Hudak, E. M., and Valdes, E. G. (2013). Mediators of the association between driving cessation and mortality among older adults. Journal of Aging and Health, 25(8 Suppl), 249S–269S. doi: 10.1177/0898264313497796

Pachana, N. A., et al. (2007). Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics, 19*(1), 103-114. doi: 10.1017/s1041610206003504

Pfeiffer, E. (1975). A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *Jolurnal of American Geriatrics Society, 23*, 433-441.

Ragland, D. R., Satariano, W. A. and MacLeod, K. E. (2005). Driving cessation and increased depressive symptoms. *Journals of Gerontology Series A: Biological Sciences & Medical Sciences, 60A*(3), 399-403.

Sheikh, J. I. and Yesavage, J. A. (1986). Geriatric Depression Scale (GDS): Recent evidence and development of a shorter version. *Clinical Gerontologist, 5*(1-2), 165-173.

Utts, J. M. and Heckard, R. F. (2012). *Mind of Statistics, 6th edition.* Boston: Brooks/Cole Cengage Learning.

Windsor, T. D., Anstey, K. J., Butterworth, P., Luszcz, M. A. and Andrews, G. R. (2007). The role of perceived control in explaining depressive symptoms associated with driving cessation in a longitudinal study. *Gerontologist, 47*(2), 215-223.

Yassuda, M. S., Wilson, J. J. 23, 525–538.and von Mering, O. (1997). Driving cessation: The perspective of senior drivers. Educational Gerontology, 23, 525-538.

Table 1. Sociodemographic Characteristics of participants

Characteristic	Total	Driving Status		P-Value
		Retiring Drivers	Retired Drivers	
Age (years)				
mean(SD)	78.85 (7.59)	77.84 (7.40)	79.78 (7.70)	0.15
Health Status				
% good or better	95 (75%)	48	47	0.25
Gender				
% Male	34 (26%)	20	14	0.15
Educational Status				
0- grade 10	52 (40%)	31	21	
grade 10+	78 (60%)	32	46	0.04
Current Residence			40	
Own home	82 (63%)	42 21	28	
Retirement village/other	49 (37%)	32		0.35
Living situation			42	
% Live alone	74 (58%)	25		0.29
Marital status		37	19	
Partnered	44 (34%)		49	
Not partnered	86 (66%)			0.14

Table 2. Well-being outcomes

	Retiring Drivers	Retired Drivers	Statistic	p-value
Anxiety (median (IQR))[a]	0.00 (0.00-4.00)	2.00 (0.00-5.00)	z= 1.92	0.05
Depression (median (IQR))[b]	2.00 (1.00-3.00)	3.00 (1.00-5.00)	z= 2.54	0.01
Self-efficacy (median (IQR))[c]	7.45(5.90-8.70)	8.33(6.33-9.11)	z=2.10	0.04

[a]Possible scores range from 0 to 20, with higher scores indicating higher anxiety.

[b]Possible scores range from 0 to 15, with higher scores indicating higher depressive symptomatology.

[c]Possible scores range from 0 to 10, with higher scores indicating higher self-efficacy.

Table 3. Community activities and alternative transport used

	Driving Status		
	Retiring Drivers	Retired Drivers	p-value
Accessing Medical Appointments			
Mode: % Alternative transport used	11.11%	100.00%	<0.001
Frequency: % At least monthly but less than weekly	34.92%	33.82%	0.90
Accessing grocery shopping			
Mode: % Alternative transport used	4.84%	100.00%	<0.001
Frequency: % At least monthly but less than weekly	96.83%	86.76%	0.06
Accessing leisure and social activities			
Mode: % Alternative transport used	8.06%	100.00%	<0.001
Frequency: % At least monthly but less than weekly	96.83%	80.30%	0.005

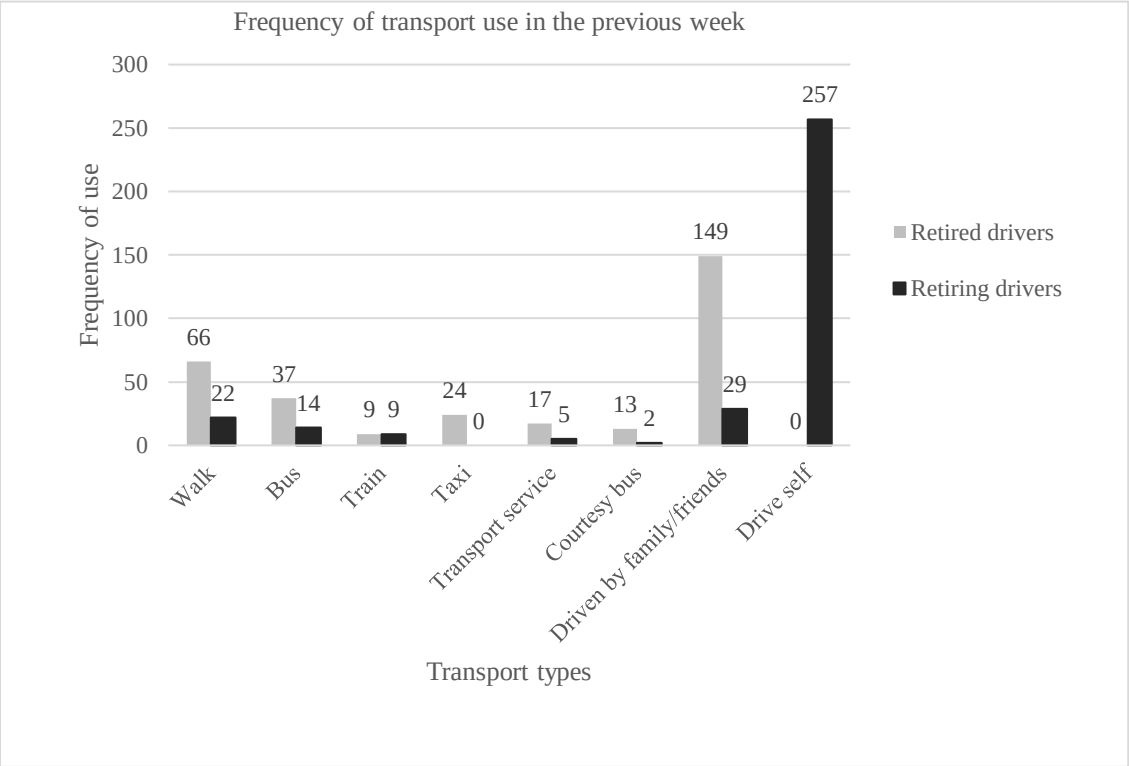

Figure1. Frequency of alternative modes of transport used in the previous week during episodes away from home as recorded by the weekly diary.