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A Prelimary Study of Differences Between Voluntary and Involuntary Retirement from Driving: Quality of Life and Depression in a Rural Population

Elizabeth Ann Pruitt Saxton
University of Vermont

A PRELIMINARY STUDY OF DIFFERENCES BETWEEN VOLUNTARY AND INVOLUNTARY RETIREMENT FROM DRIVING: QUALITY OF LIFE AND DEPRESSION IN A RURAL POPULATION

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Elizabeth Ann Pruitt Saxton

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Thesis Examination Committee

Mary Val Palumbo, D.N.P, APRN, GNP-BC, Advisor
Jane Kolodinsky, Ph.D., Chairperson
Betty Rambur, PhD., RN.
Cynthia J. Forehand, Ph.D, Dean of Graduate college

Abstract

Research has revealed a variety of negative health consequences for older adults who stop driving, and with the "graying of America," this will be a frequently encountered issue for healthcare providers. The purpose of this study was to determine if there are differences in quality of life and depressive symptoms between former drivers who made the decision to stop driving voluntarily and former drivers who made the decision involuntarily (either in a resistant or in a reluctant manner). In this cross-sectional cohort comparison study, community dwelling older adults were asked to complete questionnaires of depression (using the Geriatric Depression Scale), and quality of life (QOL) (using the Short Form Health Survey-36 questionnaire). Descriptive statistics include data for each individual group separately; separate analysis of variance (ANOVA) was used to analyze the data to determine if differences in QOL and depression exist between the groups. Results: the small sample (n=18) was predominantly comprised of women (15/18), most were widowed, and the age of participants was 81 years. No differences were detected between the three group means for the GDS, $F(2, 15) = .782$ ($p = .47$). Results for the SF-36 revealed differences between the group means in the mental health component summary was $F(2,13) = 4.209$, ($p = .039$). Conclusions: There are few differences between involuntary and voluntary former drivers demographics, but differences may exist between involuntary and voluntary former drivers' quality of life.

Dedication

This work is dedicated to my supportive and loving partner Ross, my mother, and my brother, Mikey, and to the rest of my family. It is also dedicated to my mentors and co-workers who have provided much appreciated encouragement and support.

Acknowledgement

I would like to acknowledge the UVM faculty, Cathedral Square Corporation, specifically Molly Dugan and Sarah Mariana for their support and encouragement. I would like to acknowledge Quality metrics and Optimum Insight for their generous support and allowance of the use of the SF-36 version 2 questionnaires and software-scoring program.

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CHAPTER 1: INTRODUCTION

Providing care for older adults is a challenge at the forefront of many health care providers' minds, particularly as the "baby boomers" continue to reach retirement age. In 2012, the United States' overall population was estimated to be 313,914,040, and 13.7% of the population was 65 years old or older (Center for Disease Control (CDC), 2013). Projections for the future suggest that the population of older adults will have doubled from 2000 by the year 2040, and this number will represent approximately 21% of the US's total population ("A Profile of Older Americans," 2012). With the impending growth of the older adult demographic, considerations of transportation and mobility in the elderly population are essential topics with which health care providers should be familiar. Driving has become the main method of transportation for the elderly and much research has been done to examine factors that contribute to driving cessation (Choi, Adams, & Kahana, 2012; Ross et al, 2009). Considering that older drivers are likely to experience a higher rate of injury and death from motor vehicle accidents than those younger than 65, there has been research directed at understanding predictors of driving cessation, as well as research examining the degree to which older adults accurately view their driving abilities (CDC, 2013; Edwards, Bart, O'Connor & Cissell, 2010; Freund et al., 2005).

Discussions with families about when a parent should stop driving create a difficult situation for many. These discussions are made even more difficult when one considers the potential impact that driving cessation has on an older adult's health. Recently there has been an increasing focus on the consequences of driving cessation, and subsequent research has demonstrated that the risk of dying over a three year period

was higher for those who did not drive compared to those who continue to drive, and that driving cessation is associated with increased depressive symptoms (Edwards, Perkins, Ross & Reynolds, 2009; Ragland, Satariano & Macleod, 2005). Although there have been studies examining the consequences of driving cessation in older adults, to date there are only a few studies focusing on rural elderly drivers, and even fewer that focus on the differences in these consequences between elderly drivers who stop driving voluntarily, and elderly drivers who stop driving involuntarily. Rural individuals may have more limited access to alternative transportation methods that an urban environment may afford, including public transportation services (such as buses and subways), as well as well-maintained sidewalks. Therefore, the aim of this study was to determine if there are differences in quality of life (QOL) and depression between rural community dwelling older adults who stopped driving voluntarily compared to those who stopped driving involuntarily.

Theoretical Framework

The *Transitions Theory* by Meleis, Sawyer, Im, Messias and Schumacher (2001) provides a useful framework through which the health outcomes of driving cessation can be viewed. In the context of this paper, the transition of concern is driving cessation. A transition is defined as "both the process and the outcome of complex person-environment interactions" (p. 26) where an individual travels from one condition/state toward another (Meleis, 2010). There are many important components to the transitions theory, but for this study, the most significant elements of the theory pertain to the process indicators and the transition conditions.

This study focuses on various process indicators that are used to measure progress during a transition, and in this theory, process indicators can take the form of a patient outcome (Schumacher, Jones & Meleis, 1999). The indicators relevant to this study are derived from the transitions theory, and include symptoms (as a transition may worsen existing symptoms or create new symptoms), functional status and the sense of connectedness to others (Schumacher et al., 1999). Additionally, the outcome indicator related to the development of new skills and developing a new identity can be studied through the lens of quality of life and depression assessments (Meleis et al., 2001).

In the transitions theory, the transition conditions stress the importance of an individual's preparation and knowledge (Meleis et al., 2001). In this study, the transition conditions relate to the voluntary and/or involuntary nature of an elder's decision to stop driving.

CHAPTER 2: LITERATURE REVIEW

Qualitative and Mixed Methods Research

There has been limited qualitative research that discusses the elder's perspective on the effects of driving cessation on their quality of life, but there are even fewer studies that examine the relationship between driving cessation and health effects.

A grounded theory study by Musselwhite and Haddad (2010) consisting of 57 participants examined how driving cessation and other mobility issues had a negative impact on an elder's QOL through its effects on an elder's affective and aesthetic mobility needs, specifically as these needs related to social and psychological functioning. They found that the effects on QOL appear to be more pronounced for individuals who had not planned on stopping driving (Musselwhite & Haddad, 2010). One striking limitation to this study is that the findings may not be transferable to rural older adults, as participants in this study potentially had greater access to public transportation, as an unknown proportion of participants lived in urban or suburban areas (Musselwhite & Haddad, 2010).

A similar mixed methods study involving 21 participants that incorporated a few rural participants examined the process of driving cessation and found that elders who had planned for the transition tended to report a higher QOL (Musselwhite & Shergold, 2013). Furthermore, the authors found that specific trigger events, mainly those that were sudden and that removed the locus of control from the driver, tended to have a lower QOL after stopping driving (Musselwhite & Shergold, 2013). The two aforementioned studies both took place in the United Kingdom, and therefore may not be fully applicable

to the United States, due to differences in culture and accessibility to public transportation.

Quantitative Research

There have been a number of quantitative studies that examine specific components of health and wellbeing as they relate to driving cessation. A prospective cohort study with 602 participants examined the role of driving status as it relates to a three-year mortality rate, and the authors found that the driving status classification of being a former driver demonstrated a strong association with an increase in mortality for rural adults living in Kentucky and Alabama (Edwards, Perkins et al., 2009). In a longitudinal study involving 690 participants, driving cessation has been found to have adverse effects on health trajectories of older adults, specifically involving social function, physical functioning, and daily activities (Edwards, Lunsan et al., 2009). Other researchers in a prospective cohort study of 1,772 older adults found an increase in depressive symptoms for drivers who stopped compared to those who continued to drive, and in general baseline depression was more severe among subjects who no longer drove compared to those still driving (Ragland et al., 2005). Older adults who have given up driving also were more likely to experience a significant decline in their out-of-home activities according to a longitudinal study involving 1,316 participants (Marottoli et al., 2000). Furthermore, research from Curl, Stowe, Cooney and Proulx (2013) using a longitudinal design with 4,788 participants found that elders who stopped driving often experienced a decrease in their social engagement, particularly as it related to volunteer activities and employment.

Limitations of Current Evidence

There are a number of limitations to many of the studies. A fairly common limitation is that many quantitative studies relied on the use of self-report to assess health and/or driving status (Ragland et al., 2005; Marottoli et al.,, 2000; Curl et al., 2013), others used a small sample size (Buys & Carpenter, 2002; Choi, Mezuk & Rebok, 2012), and many used modified instruments with an unknown validity and reliability after the modifications took place (Edwards, Lundsman et al., 2009; Ragland et al., 2005). Definitions of current driver, former driver, and driving cessation differed among the studies. For example, the study by Curl et al. (2013) inquired about the ability of an elder to continue driving, and did not mention the frequency of driving, or when the elder last drove in their categorization of current versus former driver, while other studies specifically inquired about those aspects of driving habits (Choi, Mezuk et al., 2012; Marottoli et al., 2000), and others used the Driving Habits Questionnaire (Edwards, Lunsman et al., 2009; Ross et al., 2009). None of the studies that used the Driving Habits Questionnaire provided any information regarding the reliability or validity of this instrument, so it is unknown whether this tool was an appropriate or accurate data collection instrument for each of the studies.

There is also a large difference in the definition of an older adult, and subsequent minimum age cutoffs for study participants ranged from 55 years old (y.o.) (Choi, Mezuk et al., 2012; Ragland et al., 2005; Ross et al., 2009), to 60 y.o. (Edwards, Perkins et al., 2009), 65 y.o. (Curl et al., 2013; Edwards, Lunsman et al., 2009; Marotoli et al., 2000), 70 y.o. (Buys et al., 2002), and lastly to 72 y.o. (Choi, Adams et al., 2012). Lastly, the majority of research does not primarily involve a rural population for whom issues of transportation may be further intensified due to limited public transportation options.

Voluntary and involuntary driving cessation. Only one quantitative survey study that included 83 participants in the Baltimore metropolitan area has specifically examined the differences between drivers who voluntarily stopped driving compared to those who involuntarily stopped driving (Choi, Mezuk et al.,2012). However, this study focused only on the motivations for driving cessation and found that the reasons often varied and tended to be multifactorial, with no clear differences between those who voluntarily or involuntarily ceased driving (Choi, Mezuk et al., 2012). To date, there has not been a study that examines the relationship between a voluntary versus involuntary decision to stop driving and the subsequent health effects for elderly individuals.

***Research question*.** Among rural community dwelling older adults, are there differences in quality of life and depression between individuals who voluntarily stopped driving and those who involuntarily stopped driving?

CHAPTER 3: METHODS

Design and Setting

This study used a cross-sectional cohort comparison design and took place in multiple rural Vermont locations. Rural is defined as communities with populations of less than 20,000 people according to town census records.

Sampling Approach

The original study was approved by the University of Vermont Institutional Review Board and included a quota sampling design with the intent to recruit 60 participants through local organizations and senior housing centers. Participating centers announced the upcoming study in a newsletter with a brief description of the study and an announcement of the date and time of an age related presentation. The newsletter stated that the survey will be distributed by the researcher (PI) after a presentation on an age-related topic. Announcements were also made by the senior housing site coordinators during resident meetings per each coordinator's availability.

The advertisement for the study was written as follows: UVM graduate nursing student seeks men and women over the age of 65 who no longer drive a motor vehicle to take part in a research study. The purpose of the study is to better understand the changes that occur after one stops driving. The study involves completing two short surveys that take approximately 15 minutes to complete. Your response will be completely confidential. Financial compensation will not be provided. There are no known risks to participating, but a benefit of participation includes contributing to the development of research.

Originally a quota sampling design was used to ensure an adequate number of participants to detect differences between the groups. The target number for participants for voluntary former drivers was 20, the target number of participants for involuntary former drivers was 40; of the 40 involuntary former drivers recruited, the target number of participants who will be further classified as a reluctant involuntary former driver or as a resistant involuntary former driver was 20 participants per each group. Responses that were returned by participants who identify as current drivers were transported in a locked file cabinet and then shredded.

Due to difficulties recruiting an adequate sample size through previously discussed methods, a protocol amendment was proposed and approved by the local IRB midway through the study. Recruitment of participants after a live age-related presentation (by the PI) was thus discontinued. Since the suspension of this recruitment method, the following was performed instead. In select senior housing communities with onsite management/program organizers, advertisements announcing the study were placed in highly visible community spaces. See appendix A and B for a visual of these announcements. The senior housing communities each had cubbies for community related announcements and newsletters for each community resident/couple. A total of 298 surveys were distributed to seven senior housing community sites, according to the population of each community without regard or knowledge of the percent of residents eligible to take part in the study. The housing community manager/organizer placed a copy of the announcement, consent sheet and questionnaires in each apartment's cubby (as site coordinators knew the number of occupants per cubby). The questionnaire packet and study advertisements directed willing participants to place their completed packet in

a locked box (to which only the PI had a key) in a place mutually determined by the PI and the site coordinator/administer by a specific date (within 2-3 weeks of original placement). See Appendix C.

Population Inclusion Criteria

Male and female Vermont residents at least 65 years old who live independently in the community and who are former drivers were the target population of this study. Living independently was defined as a participant who does not currently reside in assisted living facilities, re-habilitation, or skilled nursing facilities. Participants were required to be capable of performing activities of daily living, including bathing, toileting, mobility, eating, dressing and maintaining personal hygiene per participant self-report. Participants may receive caregiving services, but these services must take place within the participants' living space. Participants must be former drivers with a driving history of at least five years duration at any point during their lifetime. Participants must report stopping driving, such that they have no longer operated a motor vehicle for at least one month, and must not have plans to begin driving again. This information was gathered via self-report top used as a top sheep as part of the questionnaire packet, see Appendix C.

Data Collection

Baseline demographics were gathered through self-report. Further data collection will involve the use of self-report via depression and QOL questionnaires.

Baseline characteristics. Baseline characteristics will be measured through participant self-report of sex (circle male or female), age (handwritten), and marital status (participant circles one of the following: married, single, divorced, widowed). Other

baseline data included time since last having driven, options included 0-1 year ago; 2-4 years ago; 5-9 years; ago and 10 or more years ago.

Instruments. The instrument used to measure depressive symptoms included the Geriatric Depression Scale, short form (GDS-15). The GDS-15 is a shortened version of the GDS-30, which was intentionally designed for use in elderly patients. For the present study, this instrument was selected due to its ease of administration, brevity, simple response scoring, and psychometric properties. This scale involves 15 questions with yes/no answers where each question is worth one point, and a total of six or more points suggest depression; the range of score is 0-15 with a higher score being more suggestive of depression than lower scores. A literature review of studies reporting on the sensitivity and specificity of the GDS-30 and GDS-15 found the GDS-15 to be acceptably reliable and valid, with a mean sensitivity of .805 and mean specificity of .750 (Wancata et al., 2006). Also, a study that involved a population similar to the current proposed study evaluated the reliability and validity of the GDS-15 through a randomized controlled trial with 960 participants (Friedman, Heisel, & Delavan, 2005). In this study, the authors report a Cronbach's alpha of .749 for internal consistency, and reported that the instrument exhibits both construct and criterion validity, with a sensitivity measure of 81.45% and a specificity 75.36% (Friedman et al., 2005). Many studies examining the depressive symptoms related to driving cessation have used the CES-D as a measurement tool. However, the CES-D involves 20 questions, each of which allows for four responses, which may by more complicated and cumbersome for participants to fill out. Thus, in order to reduce potential difficulties for participants in completing the questionnaire, this study has instead used the GDS-15.

Quality of life was measured with the Short Form Health Survey version 2 (SF-36). This form consists of 36 items drawn from eight subscales that measure physical functioning, role limitation from physical health problems, general health perception, social functioning, role limitation from emotional problems, mental health, bodily pain, and vitality (Mishra et al., 2001). The range of scores is 0-100, where higher scores indicate better functioning and higher QOL, and lower scores indicate poorer functioning and lower QOL. There are many studies that have evaluated the use of the SF-36 in a myriad of populations. Research by Bartsch et al. (2011) involving 42,338 participants from five studies evaluated the internal consistency and structural validity of the SF-36, and concluded, "the current results confirm the psychometric properties of the eight SF-36 scales in an older population" (p. 1234). In a larger study of 177,714 Medicare recipients the reliability of all eight subscales were shown to have an internal consistency of .83-.93 (Gandek et al., 2004). In a smaller study involving 216 elders ages 65-89, the reliability of all eight subscales had a range of scores for Cronbach's alpha from .82 for the mental health scale to .94 for both the physical functioning and emotional subscales; furthermore, in this study the authors concluded that the SF-36 was shown to have strong construct validity (Lyons, Perry, & Littlepage, 1994). Others have found similar rates of reliability, and suggest that the SF-36 is an appropriate tool for research purposes (Mishra et al., 2011).

Of particular relevance to the current study is the evidence from two studies involving populations similar to the proposed sample for the current study. Walters, Munro and Brazier (2001) examined the validity of the SF-36 questionnaire for use with community dwelling older adults, whereby the questionnaire was mailed to a sample of

8,117 older adults, aged 65 and older. The authors found that the internal consistency for the social function scale had a Cronbach's alpha of .79, with the remaining seven scales showing Cronbach's alpha of .8 or greater; the authors also state that the SF-36 had demonstrated construct validity (Walters et al., 2001). Lastly, as some older adults in the current study sample may suffer from depression, it is imperative to know how well the SF-36 should be expected to perform in depressed patients. This was addressed by Beusterien, Stenwalk and Ware (1996), who found the SF-36 to be an appropriate measure for use with the elderly population with depression.

Driving status. Whether the decision to stop driving was voluntary or involuntary was measured through self-report of participants' responses to the following multiple-choice question, "Which of the following choices best describes how you decided to stop driving?" The respondent then selects one of the three following answers. Those who select "I decided to stop driving entirely of my own free will," were categorized as someone who voluntarily stopped driving, called voluntary FD. Those who select either "I stopped driving because family, friends or my healthcare provider strongly pressured me into the decision," or "someone prevented me from driving by taking away my keys, car, or my driver's license" will be categorized as someone who involuntarily stopped driving (further referred to as involuntary FD), with further sub-classifications of reluctant involuntary former drivers (reluctant FD) and resistant involuntary former drivers respectively (resistant FD) respectively.

Time since driving cessation. Times were grouped into four separate strata and were measured through a multiple-choice question, "Approximately how long ago did

you stop driving?" The respondent then selects among the four choices: a) 0-1 years ago; b) 2-4 years ago; c) 5-9 years ago, and d) 10 or more years ago.

Data Analysis

Data Analysis was performed using IBM/SPSS Statistics version 22 software. Descriptive statistics were used to analyze QOL and depression score data for each cohort separately. Descriptive statistics were also used for participant baseline characteristics, including age, sex, marital status and time since driving cessation. Furthermore, differences between the three groups' baseline characteristics were collected for comparison (sex, marital status) and an analysis of variance (ANOVA) was conducted for continuous variables (age). Comparison between voluntary former drivers and involuntary former drivers were done through t-test and ANOVA.

Separate ANOVA tests were performed for QOL measures and depression scores to test for differences between the three independent group means.

CHAPTER 4: RESULTS

The total sample size was 18 (n=18). The majority of respondents were female (15/18), see Figure 1.

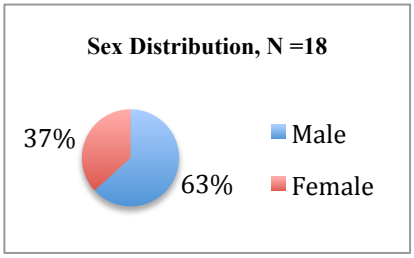

Figure 1: Sex Distribution

The majority of the sample was widowed (11/18), with the remaining being single (1/18), divorced (5/18), and married (1/18), see Figure 2.

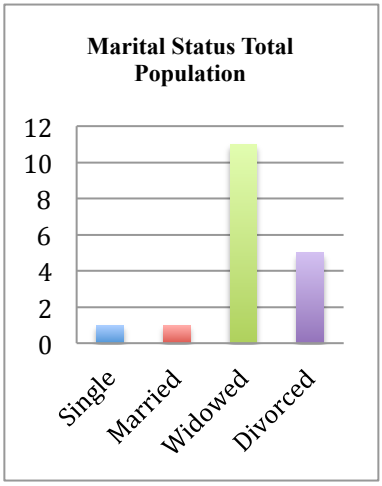

Figure 2: Marital Status

The range of participants' ages varied from 67 years to 92 years; the mean age of all participants was 81. See Figure 3 for a comparison of mean ages between the groups.

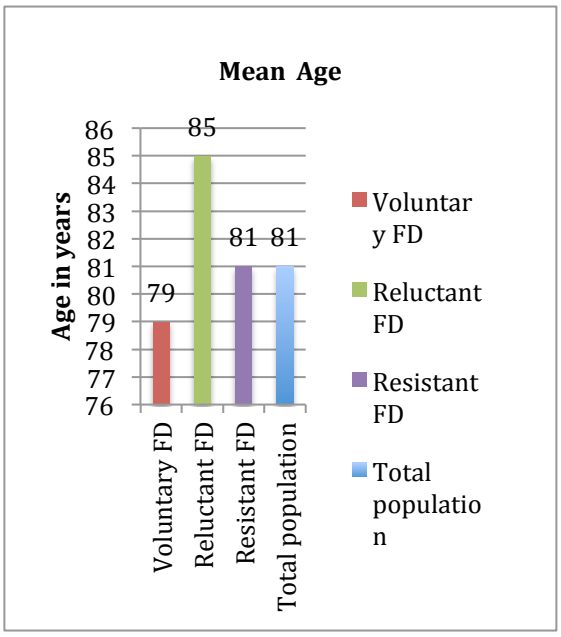

Figure 3: Mean ages of drivers per group

The majority of participants stopped driving between 0-4 years ago, with only two participants reporting stopping driving 10 or more years ago, see Figure 4. For a crosstabulation report of gender distribution in relation to former driver status see the crosstabulation in Appendix D.

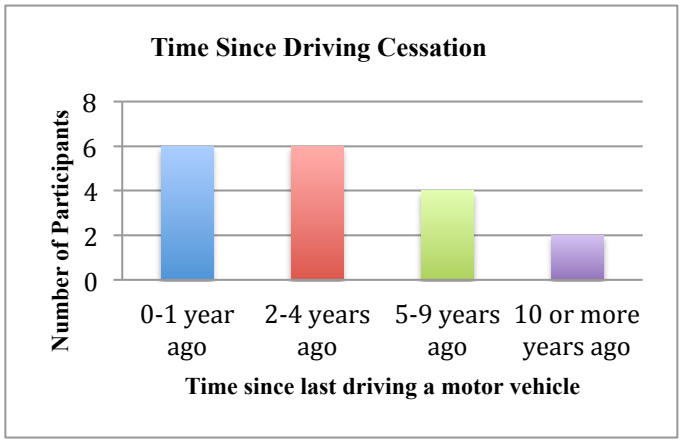

Figure 4: Time since driving cessation

The response rate was low, with a total distribution of surveys of 298, only 18 eligible packets were returned, thereby indicating a response rate of 6.04%.

The GDS results per group are represented in Table 1 below. Of all respondents, four subjects were categorized as reluctant FD, four as resistant FD and ten as voluntary FD. The range of GDS scores for reluctant FD was between 3 and 14, resistant FD ranged from 1 to 12 and voluntary FD ranged from 1-10. The ranges of ages per group sample are also represented in Graph 1 with the mean being lowest in the voluntary FD group at 79.1 years compared to the eldest group from the reluctant FD of 84.75 years.

Table 1: Descriptive Statistics for the Geriatric Depression Scale

Descriptive Statistics GDS

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
GDS_Total	Reluctant	4	6.75	4.924	2.462	-1.09	14.59	3	14
	Resistant	4	6.50	4.509	2.255	-.68	13.68	1	12
	Voluntary	10	4.40	2.951	.933	2.29	6.51	1	10
	Total	18	5.39	3.712	.875	3.54	7.23	1	14
Age	Reluctant	4	84.75	5.965	2.983	75.26	94.24	76	89
	Resistant	4	81.25	9.639	4.820	65.91	96.59	67	88
	Voluntary	10	79.10	7.724	2.442	73.57	84.63	69	92
	Total	18	80.83	7.725	1.821	76.99	84.67	67	92

In the entire sample, the youngest participant was 67, and eldest was 92 years old. See Figure 5 for a visual representation of the mean, minimum and maximum ages per group, and Figure 6 for a visual representation of the mean, minimum and maximum GDS score per group.

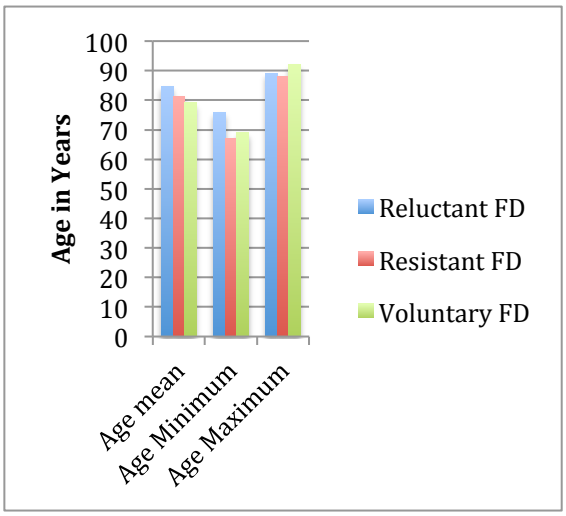

Figure 5: Age ranges per group

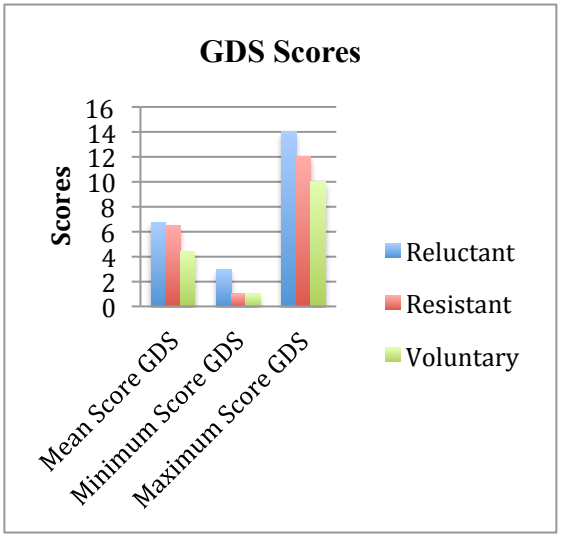

Figure 6: GDS range of score per group

Testing differences between group means using an Analysis of Variance (ANOVA) for the geriatric depression scale revealed no statistically significant differences $F(2, 15) = .782$ ($p = .47$). Similarly, differences between group means of age revealed no statistically significant differences between the groups $F(2, 15) = . 749$ ($p=40$). See Table 2 for full further details. A post hoc analysis was performed and

revealed no statistically significant differences in the GDS while comparing each group separately, see Appendix D.

Table 2: Analysis of Variance of Group Means.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GDS_Total	Between Groups	22.128	2	11.064	.782	.475
	Within Groups	212.150	15	14.143		
	Total	234.278	17			
Age	Between Groups	92.100	2	46.050	.749	.490
	Within Groups	922.400	15	61.493		
	Total	1014.500	17			

Due to the small sample size obtained during this study, for the purpose of a more complete analysis a t-test was conducted to compare two group means (reluctant FD and resistant FD were grouped together into the category of involuntary FD) and were compared to voluntary FD scores. These statistics also show that there were no detectable statistically significant difference between the two groups $T(16) = 1.28$ ($p = .216$). See tables 3 and 4 for full data set.

Table 3: T-test comparing Involuntary and voluntary FD GDS group means

Group Statistics

	Group2	n	Mean	Std. Deviation	Std. Error Mean
GDS_Total	Involuntary	8	6.63	4.373	1.546
	Voluntary	10	4.40	2.951	.933

Table 4: Independent samples test for GDS

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
GDS_Total	Equal variances assumed	1.125	.305	1.288	16	.216	2.225	1.728	-1.438	5.888
	Equal variances not assumed			1.232	11.811	.242	2.225	1.806	-1.717	6.167

Regarding the quality of life measures, the SF-36 result yielded the following information presented in Figures 7, 8 and 9. Prior to interpreting the information, the following abbreviations in the relevant tables and graphs are defined as such: PCS is the physical component summary; MCS is the mental component summary; GH is general health; PF is physical functioning; RP is role physical; BP is bodily pain; VT is vitality; SF is social functioning; RE is role emotional.

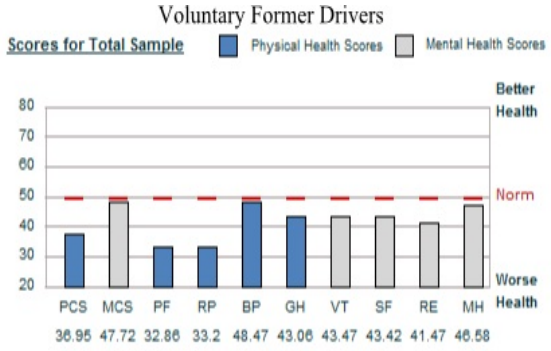

Figure 7: SF-36 Scores Voluntary FD

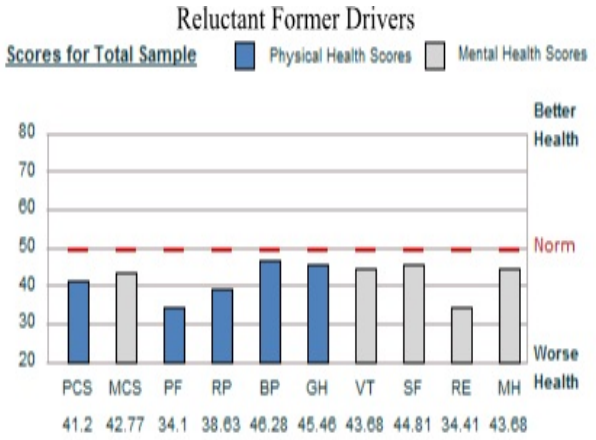

Figure 8: SF-36 Reluctant FD

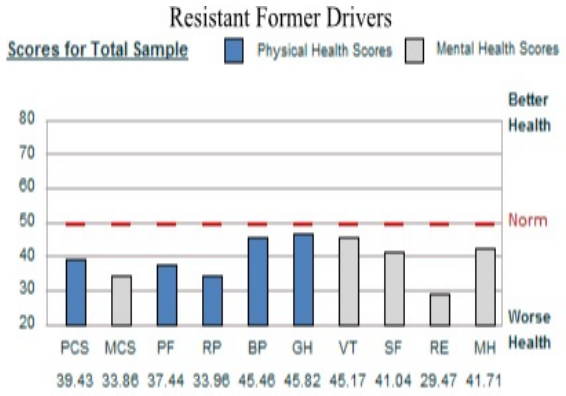

Figure 9: SF-36 Resistant Former Drivers

From the results of the SF-36, the only apparent statistically significant difference noted in the questionnaires occurred in the MCS component, where $F(2,13) = 4.209$, ($p = .039$). See below in table 4 for full details of ANOVA statistics. In a post hoc analysis test of multiple comparisons, the MCS subcomponent continued to reveal a statistically significant difference between the mean difference of resistant and voluntary former drivers ($p = .013$). Additionally, MCS subset comparing reluctant to voluntary FD did not reach statistical significance ($p = .13$) and the RE subset approached statistical significance when comparing resistant to voluntary drivers ($p = .098$). See Appendix E

for full statistical description of the post hoc analysis and of the results of the comparison between the involuntary and voluntary FD using t-test statistics.

Table 5: Results of ANOVA testing for SF-36 QOL Questionnaire

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
PF_NBS	Between Groups	60.003	2	30.002	.250	.782
	Within Groups	1800.601	15	120.040		
	Total	1860.604	17			
RP_NBS	Between Groups	85.747	2	42.873	1.068	.370
	Within Groups	561.810	14	40.129		
	Total	647.557	16			
BP_NBS	Between Groups	29.943	2	14.971	.079	.925
	Within Groups	2662.462	14	190.176		
	Total	2692.404	16			
GH_NBS	Between Groups	29.802	2	14.901	.135	.874
	Within Groups	1649.737	15	109.982		
	Total	1679.538	17			
VT_NBS	Between Groups	8.346	2	4.173	.031	.969
	Within Groups	1871.760	14	133.697		
	Total	1880.106	16			
SF_NBS	Between Groups	29.327	2	14.663	.111	.895
	Within Groups	1842.463	14	131.605		
	Total	1871.790	16			
RE_NBS	Between Groups	373.131	2	186.565	1.836	.199
	Within Groups	1321.291	13	101.638		
	Total	1694.421	15			
MH_NBS	Between Groups	71.766	2	35.883	.308	.740
	Within Groups	1633.544	14	116.682		
	Total	1705.310	16			
PCS	Between Groups	53.321	2	26.661	.320	.732
	Within Groups	1082.216	13	83.247		
	Total	1135.537	15			
MCS	Between Groups	438.610	2	219.305	4.209	.039
	Within Groups	677.365	13	52.105		
	Total	1115.975	15			

Chapter 5: Discussion

Quality of life scores represented in figures 7, 8, and 9 involve norm based scoring, and in all three groups, for each subscale of the SF-36 all groups scored lower than the norm. This could indicate that in general this sample population had poorer quality of life than the general population (which would include younger individuals and those still driving). Furthermore, QOL scores did reveal significant differences between the groups in the mental health summary component, which does indicate that there are differences between the groups, however it does not indicate the direction. In the post hoc analysis of QOL data reported in the Appendix it becomes apparent that the difference between groups specifically exists between the voluntary FD and resistant FD; additionally resistant FD and reluctant FD approach significance in the post hoc analysis, which could be further clarified in future studies utilizing a larger sample size. Lastly the post hoc analysis reveals that the differences between resistant FD and Voluntary FD approaches significance as well ($p = .098$), which again could be further clarified by using a larger sample population.

Due to the small sample size and very low response rate, 6.04%, it is difficult to draw any solid conclusions, but with a larger sample size differences between the groups may become clearer, if such differences indeed exist. The large majority of respondents in all categories were female, most were widowed, and all were at least 67 years old. The mean GDS scores did not differ significantly between the three groups, nor did they differ between involuntary and voluntary FD. However, since the desired sample size of 60 total participants was not reached, caution is advised while interpreting such data, as a larger sample size could potentially reveal differences between the groups. This study

also did not include a power analysis calculation to approximate an adequate sample size for detecting differences with an alpha level of .05.

Relationship To Existing Research and Implications for Future Practice, Research, Policy

While this study did not compare drivers to non-drivers and focused solely on those who are former drivers, the results of the study indicate that in general non-drivers may suffer from depression (mean scores for involuntary former drivers were around 6). Fonda, Wallace and Herzog (2001) noted that although they observed increased depressive symptoms in those who stopped driving, they did not account for the potential role that the way in which someone stopped driving had an impact on their symptoms. Fonda, Wallace and Herzog (2001) state,

> Family intervention, advice from a physician, a crash, state intervention, the costs of operating a vehicle, and a decision by the older driver could each lead to changes in driving patterns, but with very different implications for how the drivers interpret these changes and, ultimately, for their affective wellbeing. (p. S348)

This current study aimed to discover if the way in which an individual stopped driving could have an influence on depression and wellbeing. Future studies should address the other areas of concern mentioned by Fonda, Wallace and Herzog, and should inquire about additional factors such as number and frequency of crashes, the role of finances involved with owning a car, and whether or not state involvement was necessary.

There is little research investigating the differences between involuntary FD versus voluntary FD, but existing research that compares former drivers to current drivers reveal many similarities. Fonda, Wallace and Herzog (2001) suggest that some believe

that increased depressive symptoms are due to a decrease in mobility. These authors used the 20-item CESD to measure depression scores at three different periods of time over 3-5 years and found that those who stopped driving were at higher risk for increased numbers of depression symptoms. They also found that "depressive symptoms are not mitigated by the presence of a spouse who drives." (Fonda et al., 2001, p. S349). Although this current study did not examine the availability of alternative forms of transportation, other studies have.

Choi, Adams and Kahana (2012) suggest that when an older adult no longer drives, they tend to seek support from informal friend networks more so than family members or public transportation. They also found that those who had support from friends tended to have an increased likelihood of stopping driving. This has implications for further research; if one were to conduct a similar study to the current study, inquiring about availability of resources for alternatives to driving could provide further or more nuanced data regarding the health and wellbeing of nondrivers.

Marottoli, de Leon, Glass, Williams, Cooney, and Berkman (2000) also raise the point that older individuals tend to have less access to alternative forms of mobility due to potential functional limitations and inclement weather. Although not addressed directly (in terms of functional limitation) in this current study, this variable could certainly add to the value of future studies by including such data, as this study took place in a rural environment where inclement weather is of high concern. A rural environment also could influence the availability and feasibility of alternate transportation, such as access to buses, taxis, other public transportation symptoms, or simply even having a safe walking space with well maintained side walks and lighting. Rural areas tend to have less

access to these kinds of resources and therefore could be a confounding variable for interpreting results.

Fonda, Wallace & Herzog (2001) found that individuals who self-restricted their driving before stopping completely did not experience such a large increase in depressive symptoms as others. With this information in mind, some implications for future research could be to delve deeper into research that aims at helping prepare older adults to stop driving, and encourage them to self-regulate to help mitigate future potential effects on mental health and wellbeing. Fonda (2001) recommends trying to keep people driving safely as long as possible, and if this is not feasible, then to find ways to educate drivers and family members regarding other transportation methods and to be aware of mental health services to mitigate negative effects (Fonda, Wallace & Herzog, 2011). The notion that the elderly should try to continue driving as long and as safely as possible is also echoed by a number of other studies on this topic, including Edwards, Perkins, Ross and Reynolds (2009) who suggest that driving cessation should be the last option considered based on their findings of increased mortality rates over a 3 year period. Marottoli et al (2000) also advocate for advance planning for different methods of transportation, and easier access to senior centers (to maintain out of home activities). Ross et al. (2009) also advocate for interventions to maintain mobility and mitigate the negative effects of DC through alternative transportation.

Similarities to Other Studies

Edwards, Perkins, Ross and Reynolds (2009), state that "nondrivers tend to be older; are more likely to be female; and have more medical conditions, poorer self-ratings of health, greater cognitive decline and more functional difficulties" (p. 300). The current

study population findings were consistent with Edward et al.'s(2009) findings that nondrivers tended to be older (mean age 81), and female; no difference were detected among the different groups of former drivers in regards to functional limitations and self-ratings of health (cognitive function was not incorporated into this study design). Future studies could also consider adding a measure of cognitive health to help control confounding variables.

Ross, Clay, Edwards, Ball, Wadley, Vance, Cissell, Roenker and Joyce (2009) note that there are predictors of driving cessation, which include being female, increasing age, and lower physical activities levels, cognitive function and vision (via the UFOV test). Their study found that "self-regulation may not be sufficient to offset crash risk in the subsample of participants" (Ross et al., 2009, p. 167). Ragland, Satariano, and Macleod (2005) found that baseline characteristics of former drivers generally indicated older age, lower levels of education, female gender, being widowed, and having poor health. Ragland makes a remarkable point for interpretation of data, stating "Driving cessation could contribute to depressive symptoms through a loss of independence and mobility; depressive symptoms may accelerate the process of driving cessation or a change in some third variable(s) (e.g. a particular health condition) could affect depression and driving cessation." (p. 401). This current study was congruent with this study as well, indicating that former drivers were generally older, female, and were widowed. Future studies should assess for level of education.

Edwards, Lunsman, Perkins, Rebokk and Roth (2009) also report that older former drivers tended to be women, older, have lower levels of education and tend to report physical difficulties. "Interestingly, the increased social isolation and depression

are not ameliorated by access to alternative transportation." (Edwards, Lunsman et al., 2009, p. 1290). Also being a non-driver could reduce one's access to health care. Congruent with the recommendations of others, Edwards et al. suggest that continued mobility through driving is very important for maintaining health and wellbeing.

As many prior research articles promote the continuation of driving among older adults as long as possible to avoid potential negative health outcomes (depression, decreased out of home activities, decreased mobility, early mortality, etc.) this must be balanced with the safety of the older adult driver and other drivers sharing the roadways. To this end, nurse practitioners could provide a means of helping to strike that balance through screening and health promotion. One proposed method of doing so would be to introduce screening of drivers and discussing options for those drivers whom NPs. as well as other primary care providers, worry about having safe driving abilities, as well as patients who come in seeking advice or help with planning for such a transition.

To this end, Curl, Stowe, Cooney, and Proulx (2013) suggest that "It is critical to discuss driving transition planning. Normalizing the process of driving cessation and making it a routine topic of late-life planning are key to ensuring that viable pathways exist to maintain engagement after giving up the keys" (p. 10). This is particularly important since Musselwhite and Shergold (2013) found that older individuals who had planned to stop driving had a better quality of life than those who did not plan to stop; additionally, those who "had gradually weaned themselves off driving" (p. 96) also did well after stopping driving.

One study seems to suggest the apparent willingness of some individuals to engage their primary care provider in such discussions. Tuokko, McGee, Gabriel, and

Rhodes (2007) conducted research with 86 older adults who agreed to participate in a voluntary six part series of driving education, found that although most drivers did not feel that they were at greater risk of crashing, that they did believe they were more likely to sustain injuries compared to younger drivers. Participants tended to agree that there are acceptable times where driving needs to be monitored or restricted, but the range of expectations of who should be the one fulfilling this role differed: only 14% of women said that a family member should do this, 40% of women and 47% of men stated that their doctors would be the most appropriate. Overall 60% stated that they would be willing to change their driving behavior. The authors suggest that materials should be developed to facilitate these interactions, since such a high number of participants were willing to listen to their health care providers. This is a worthy suggestion, and there are ample materials through organizations such as the American Association of Retired Persons (AARP) that provide online educational materials regarding safe driving at an older age (www.aarp.org, n.d.). Additional resources also come from the national highway traffic safety administration, which has resources tailored to older drivers, including fact sheets and materials for family members and friends of older drivers (http://www.nhtsa.gov/Driving+Safety/Older+Drivers, n.d.).

Betz, Jones et al. (2014) studied both older adults' and clinicians' perspectives on implementing driving assessments in the primary care setting, discovered through their work that many clinicians and patients would be open to the concept of universal screening of all older adults, follow-up by individual counseling and a referral to a behind the wheel assessment (BTW) if this was able to be done in a time efficient manner and did not make patients feel "singled out," and provided further BTW assessments were

affordable. Many areas have driver rehabilitation programs that offer comprehensive driving assessment, education and even vehicle adaptations to help individuals maintain their driving status.

There has been research directed at driver education programs that NPs could offer to their patients. Liddle, Haynes, Pachana, Mitchell, McKenna and Gustafsson (2013) recognize that the "Reasons for ceasing driving are recognized as complex and multifactorial, and the needs experienced during driving cessation may vary from the practical…to the emotional." (p.2). Liddle et al. (2013) discuss the UQDRIVE program for driving cessations, which has a component of brief awareness raising for people who are in the "past" and "pre" decision phases, as well as more in depth education and support programs for others further along in the process of driving cessation. The purpose of their study was to determine the effectiveness of the program in supporting retired and retiring drivers to maintain community engagement and mobility. The program involved 6 sessions lasting between 3-4 hours each. The authors found that this program was successful at increasing time away from home, use of other transportation means, improved self-efficacy and increased mobility initially after the program. Although these improvements were not sustained beyond 3 months, this must be interpreted with caution due to a high attrition rate (largely due to death). Therefore the role of the NP could be important in helping an older adult locate driver education programs, especially those with evidence to support their effectiveness in helping older drivers retire and protect themselves from the potential harms of driving cessation.

Other Implications for Future Studies:

A study by Kolodinsky, Desisto, Propen, Putnam Roche and Sawyer (2013) report that specific characteristics can have an effect on an individual's mobility needs. Specifically the authors found that owning at least one motor vehicle can reduce the probability of having unmet mobility needs (although of note, this study did not focus on elders). A future implication for studies would be to include the total number of individuals living in the household, and number of vehicles owned per household/number of individuals still driving to gauge whether or not the presence of other drivers in the household could be a confounding variable to the interpretation of studies involving non-drivers.

Limitations and Future Recommendations

There are a number of notable limitations to this study. First is the very low response rate, only 6%. Secondly, the change in study protocol midway through can confound results. Not every single participant answered every question on the SF-36, but one advantage is that the statistical software has norm based scoring that allows for estimates of scores based on the remaining answers in the SF-36. Additionally, an unknown amount of survey responses came from the live presentations; therefore the actual response rate cannot be accurately determined based on the survey response.

Furthermore the initial sample design, a quota sample, was unable to be met due to low numbers and was subsequently changed to a convenience sample. However, after analysis, a quota sample was nearly achieved, as 10 participants were voluntary, 8 were involuntary, with further subdivisions into 4 participants as reluctant FD and 4 as resistant FD. Therefore, since this ended up being a convenience sample, this study has multiple avenues where bias may have a potential role, and the results should therefore be

considered in light of these potential limitations. Perhaps the most significant source of bias is responder bias, whereby those who have a more a more vested interest in the information may be more likely to respond and therefore skew the data. Another trouble with convenience sample is that those who are available to complete the survey might be atypical of the population with regard to critical variables (Polit & Beck, 2012).

A statistical power analysis was not completed prior to undertaking this pilot study. There have been some similar studies done, but none that specifically examined the SF-36 and therefore a power analysis to detect a sizable population was not undertaken—hence the desire for a quota sample. In future studies a power analysis should be conducted to determine an adequate size to set an alpha level of .05

There is also room for a number of confounding variables not accounted for in this study, most of which were mentioned in the above discussion section. Key among these include assessing for dementia. Since this study did not account for the potential of dementia, recall bias could be a potential limitation, as those with dementia may confabulate data, or simply lack the short-term recall required to answer the survey questions accurately. Additional variables that should have been included in this study include factors that could have an impact on one's ability to drive or depression, such as arthritis, previous stroke, MI, severe functional limitation, confusion, other comorbid conditions, visual acuity, a more precise measure of amount of total time driven in one's life time, number of crashes, and whether or not the individual self-regulated their own driving behavior prior to stopping (such as not driving at night time, driving only certain distances). Additionally, this study did not account for common socio-demographic conditions, such as race/ethnicity, income, exact type of housing situation, those with

whom one lives, education level and any previous experience with driving cessation counseling or education.

Therefore, this study has very limited, if any, generalizability to other situations due to the small sample size which may have limited the ability to detect further significant differences, if such differences even exist. However it could serve as a basis for future studies that are willing/capable of including the above mentioned tests and are able to recruit a much larger population.

Suggestions for Future Studies.

Future studies should consider a different method of recruitment to gain a greater sample size, such as using facilities that see many older individuals, such as geriatric clinics, or driver rehabilitation programs, senior centers, etc. Different methods to increase sample size would be to offer incentives such as a raffle, or monetary compensation for time. Additionally, a face-to-face administration of the survey may result in more complete surveys. Future studies could incorporate a comparison group of current drivers, as this may be helpful in determining if all former drivers (regardless of the method in which an individual ceased driving) tend to have lower quality of life and higher depressive symptoms in general compared to current drivers.

Strengths of This Study

The strengths of this study include the following:

- The use of well-validated and reliable instruments (the GDS and the SF-36) that have strongly established psychometric properties.
- Strict adherence to protocol
- IRB approval for original studies and protocol changes.

- Preliminary study

Conclusion

The majority of the study population was female, widowed and the average age of participants was 81 years old. There were no statistically significant differences between the three group means for the depression scale, but there was a statistically significant difference noted in the MCS component of the SF-36, where $F(2,13) = 4.209$, ($p = .039$). Conclusions are to be interpreted with caution due to the small sample size, but through future research using alternative methods of sample recruitment and data collection methods, and a larger sample size may increase confidence in the findings of the current results, by providing a more robust data set allowing for stronger conclusions.

Even though there were no statistically significant differences between levels of depression and most components of quality of life, this study still has implications for an older individual's health and mobility needs that can be addressed by additional studies and public policy initiatives. The older adults (non-drivers) in this study had a high prevalence of depressive symptoms and generally low QOL. Some of these negative health effects could possibly be due to a number of factors mentioned above, and future policies that address mobility needs of rural older adults may benefit the growing number of older adults.

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APPENDICIES

Appendix A: Recruitment materials For Sites Already Visited

Have you stopped driving a car?

Here's your chance to take part in a study:

Is There a Relationship Between No Longer Driving and Health?

If you have fifteen minutes to spare and would like to be an important part of this study, please read the following details:

A UVM graduate nursing student is seeking men and women over the age of 65 who no longer drive a motor vehicle to take part in a research study. The purpose of the study is to better understand the changes that occur after one stops driving. The study involves completing two short surveys that take approximately 15 minutes to complete. Your response will be completely confidential. Financial compensation will not be provided. There are no known risks to participating, but a benefit of participation includes contributing to the development of research and knowledge!

Information from this study will hopefully one day be used to help develop programs to assist former drivers with managing possible health effects of stopping driving.

Your participation is completely voluntary. If you chose to participate, please turn over this page to find the instructions, and the survey.

Please return your survey to your SASH/SITE coordinator at the designated lockbox near the coordinator's office by:

Thank you to those who have already participated in this study! Please do not fill out this questionnaire if you have already done so.

Appendix B: Recruitment materials for sites not previously visited

Have you stopped driving a car?

Here's your chance to take part in a study:

Is There a Relationship Between No Longer Driving and Health?

If you have fifteen minutes to spare and would like to be an important part of this study, please read the following details:

A UVM graduate nursing student is seeking men and women over the age of 65 who no longer drive a motor vehicle to take part in a research study. The purpose of the study is to better understand the changes that occur after one stops driving. The study involves completing two short surveys that take approximately 15 minutes to complete. Your response will be completely confidential. Financial compensation will not be provided. There are no known risks to participating, but a benefit of participation includes contributing to the development of research and knowledge**!**

Information from this study will hopefully one day be used to help develop programs to assist former drivers with managing possible health effects of stopping driving.

Your participation is completely voluntary. If you chose to participate, please turn over this page to find the instructions, and the survey.

Please return your survey to your SASH/SITE coordinator/the designated lockbox near the coordinator's office by:

Appendix C: Questionnaire Packet Materials
Appendix C.1 Research Information Summary

Title of Research Project: Differences Between Voluntary and Involuntary Retirement from Driving: Quality of Life and Depression

Principal Investigator: Elizabeth Saxton, RN.

Faculty Sponsor: Mary Val Palumbo DPN, APRN., GNP-BC

You are being invited to take part in this research study because this study focuses on measures of wellbeing for people who are 65 years old or older and who no longer drive a motor vehicle. This study is being conducted by a graduate nursing student from the University of Vermont.

We encourage you to ask questions and take the opportunity to discuss the study with anybody you think can help you make this decision.

Why is This Research Study Being Conducted? The purpose of the study is to better understand the changes that occur after one stops driving.

How Many People Will Take Part In The Study? The aim of this study is to find 150 participants.

What Is Involved In The Study? This study involves filling questionnaires by paper and pen/pencil. This should take about 15 minutes to complete. There are different kinds of questions on this survey, including yes/no answers, and multiple choice answers. For example, "Do you enjoy going out for a walk?" yes/no and multiple answer questions such as, "I enjoy going reading a book at night" and you select one of the following. a. always b. sometimes, c. rarely, d. never. Please answer all of the questions to the best of your ability. There is no penalty for skipping a question, but you are encouraged to answer as many questions as possible. If you wish to discontinue your participation in the study, you can do so by bringing your questionnaire forward, and it will be placed in a separate folder to be shredded. Your name will not be on any of the forms. You will have a place to sit where your neighbor will not be able to see your answers. If you need assistance, please raise your hand and the researcher will try to answer the question.

What Are The Risks and Discomforts Of The Study? There are no risks of injury or discomfort from completing the questionnaires.

There is a risk that confidential information might accidentally be disclosed. To protect your confidentiality, your name will not be recorded on any of the forms and professional standards for protecting confidential information will be used to minimize this risk.

There is a risk that you may have thoughts and feelings that make you uncomfortable as you reflect upon your well-being. If you become uncomfortable at any time during this process, you are free to raise your hand to speak with the researcher and/or stop your participation. Should you desire to process any thoughts or feelings that may have come up for you during your participation we advise you to seek care from your primary care provider, or contact any of the following resources for additional help.

- Chittenden Crisis Services of Chittenden County (802) 488-6400.
- Call 911 if you are having thoughts of hurting yourself or others
- Call 2-1-1 to access additional local resources
- If you are a member of SASH, speak to you coordinator or nurse for assistance

What Are The Benefits of Participating In The Study? The benefits of the study include contributing to research knowledge development for society.

What Other Options Are There? Your participation is optional; you will not be penalized in any manner for not participating.

Are There Any Costs? No

What Is the Compensation? There will not be compensation offered for your participation.

Can You Withdraw From This Study? You may choose to stop your participation at any point while filling out the questionnaires. There are no consequences for discontinuing.

What About Confidentiality?
Confidentiality is of primary concern in this study. The security of your questionnaires will be maintained by storing them in a locked file cabinet at all times. Only the Principal Investigator will have access to this information, and may be shared with the Faculty Sponsor. The results of this study may eventually be published, but patient confidentiality will be maintained.

Contact Information

You may contact Elizabeth Saxton, the Investigator in charge of this study, at epruitt@uvm.edu for more information about this study. If you have any questions about your rights as a participant in a research project or for more information on how to proceed should you believe that you have been injured as a result of your participation in this study you should contact Nancy Stalnaker, the Director of the Research Protections Office at the University of Vermont at 802-656-5040.

You have been given and have read or have had read to you a summary of this research study. Should you have any further questions about the research, you may contact the person conducting the study at the address and telephone number given below. Your participation is voluntary and you may refuse to participate or withdraw at any time without penalty or prejudice.

You agree to participate in this study by completing the questionnaires. Please keep this form for if you have any questions or concerns in the future.

Name of Principal Investigator: Elizabeth Saxton
Address: 608 Mill Pond Rd #5 Colchester, VT
Telephone Number: 240-285-8858

Name of Faculty Sponsor: Mary Val Palumbo
Address: 106 Carrigan Drive, Burlington, VT 05655
Telephone Number: (802) 656-0023

Appendix C.2 Demographic Top Sheet

Differences Between Voluntary and Involuntary Retired Drivers

Do NOT write your name of this sheet.

Please answer all of the questions. Circle the answers that best describe you:

What is your gender?

a) Male
b) Female

What is your marital status?

a) Married
b) Single
c) Divorced
d) Widowed

Which of the following choices best describes how you decided to stop driving?

a) I decided to stop driving entirely of my own free will
b) I stopped driving because family, friends or my healthcare provider strongly pressured me into the decision
c) Someone prevented me from driving by taking away my keys, car, or my driver's license

Approximately how long ago did you stop driving?

a) 0-1 year ago
b) 2-4 years ago
c) 5-9 years ago
d) 10 or more years ago

What is your age? _____

a. Do you live in a nursing home, re-habilitation facility or assisted living environment? **Yes** **No**

b. Are you a Vermont resident? **Yes** **No**

c. Do you currently drive? **Yes** **No**

d. Do you plan to start driving again in the future? **Yes** **No**

e. Have you driven a car for at least 5 years at some point in your life? **Yes** **No**

f. When was the last time you drove a car?

i. Within the past month

ii. Within the past 3 months

iii. 6 months ago or longer

g. Are you able to bathe, eat, get dressed, use the toilet, and get around your home by yourself? **Yes** **No**

If you need help with any of these activities, is this help provided in your home? **Yes** **No**

Appendix C.3 Geriatric Depression Scale

Geriatric Depression Scale, Short Form

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life? **YES / NO**

2. Have you dropped many of your activities and interests? **YES / NO**

3. Do you feel that your life is empty? **YES / NO**

4. Do you often get bored? **YES / NO**

5. Are you in good spirits most of the time? **YES / NO**

6. Are you afraid that something bad is going to happen to you? **YES / NO**

7. Do you feel happy most of the time? **YES / NO**

8. Do you often feel helpless? **YES / NO**

9. Do you prefer to stay at home, rather than going out and doing new things? **YES / NO**

10. Do you feel you have more problems with memory than most? **YES / NO**

11. Do you think it is wonderful to be alive now? **YES / NO**

12. Do you feel pretty worthless the way you are now? **YES / NO**

13. Do you feel full of energy? **YES / NO**

14. Do you feel that your situation is hopeless? **YES / NO**

15. Do you think that most people are better off than you are? **YES / NO**

Appendix D: Chart 3, Post Hoc Tests of GDS and Age

Multiple Comparisons

LSD

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
GDS_Total	Reluctant	Resistant	.250	2.659	.926	-5.42	5.92
		Voluntary	2.350	2.225	.308	-2.39	7.09
	Resistant	Reluctant	-.250	2.659	.926	-5.92	5.42
		Voluntary	2.100	2.225	.360	-2.64	6.84
	Voluntary	Reluctant	-2.350	2.225	.308	-7.09	2.39
		Resistant	-2.100	2.225	.360	-6.84	2.64
Age	Reluctant	Resistant	3.500	5.545	.537	-8.32	15.32
		Voluntary	5.650	4.639	.242	-4.24	15.54
	Resistant	Reluctant	-3.500	5.545	.537	-15.32	8.32
		Voluntary	2.150	4.639	.650	-7.74	12.04
	Voluntary	Reluctant	-5.650	4.639	.242	-15.54	4.24
		Resistant	-2.150	4.639	.650	-12.04	7.74

Crosstabulation For the Distribution of Marital Status, Gender and Type of Former Driver

*Gender * Group Crosstabulation*

			Group			
			Reluctant	Resistant	Voluntary	Total
Gender	F	Count	4	3	8	15
		% within Group	100.0%	75.0%	80.0%	83.3%
	M	Count	0	1	2	3
		% within Group	0.0%	25.0%	20.0%	16.7%
Total		Count	4	4	10	18
		% within Group	100.0%	100.0%	100.0%	100.0%

Crosstabulation of Marital Status and Type of Former Driver

*Marital status * Group Crosstabulation*

			Group			
			Reluctant	Resistant	Voluntary	Total
Marital status	Married	Count	0	0	1	1
		% within Group	0.0%	0.0%	10.0%	5.6%
	Single	Count	0	0	1	1
		% within Group	0.0%	0.0%	10.0%	5.6%
	Divorced	Count	0	2	3	5
		% within Group	0.0%	50.0%	30.0%	27.8%
	Widowed	Count	4	2	5	11
		% within Group	100.0%	50.0%	50.0%	61.1%
Total		Count	4	4	10	18
		% within Group	100.0%	100.0%	100.0%	100.0%

Appendix E: **Post Hoc Analysis of SF-36 QOL Questionnaire**.

Multiple Comparisons

LSD

						95% Confidence Interval	
Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
PF_NBS	Reluctant	Resistant	-3.35000	7.74726	.672	-19.8629	13.1629
		Voluntary	1.23200	6.48182	.852	-12.5837	15.0477
	Resistant	Reluctant	3.35000	7.74726	.672	-13.1629	19.8629
		Voluntary	4.58200	6.48182	.490	-9.2337	18.3977
	Voluntary	Reluctant	-1.23200	6.48182	.852	-15.0477	12.5837
		Resistant	-4.58200	6.48182	.490	-18.3977	9.2337
RP_NBS	Reluctant	Resistant	4.67333	4.83826	.350	-5.7037	15.0504
		Voluntary	5.42800	3.74770	.170	-2.6100	13.4660
	Resistant	Reluctant	-4.67333	4.83826	.350	-15.0504	5.7037
		Voluntary	.75467	4.17006	.859	-8.1892	9.6985
	Voluntary	Reluctant	-5.42800	3.74770	.170	-13.4660	2.6100
		Resistant	-.75467	4.17006	.859	-9.6985	8.1892
BP_NBS	Reluctant	Resistant	.81000	9.75130	.935	-20.1045	21.7245
		Voluntary	-2.19500	8.28701	.795	-19.9689	15.5789
	Resistant	Reluctant	-.81000	9.75130	.935	-21.7245	20.1045
		Voluntary	-3.00500	8.28701	.722	-20.7789	14.7689
	Voluntary	Reluctant	2.19500	8.28701	.795	-15.5789	19.9689
		Resistant	3.00500	8.28701	.722	-14.7689	20.7789
GH_NBS	Reluctant	Resistant	-.35500	7.41561	.962	-16.1610	15.4510
		Voluntary	2.40100	6.20434	.704	-10.8232	15.6252
	Resistant	Reluctant	.35500	7.41561	.962	-15.4510	16.1610
		Voluntary	2.75600	6.20434	.663	-10.4682	15.9802
	Voluntary	Reluctant	-2.40100	6.20434	.704	-15.6252	10.8232
		Resistant	-2.75600	6.20434	.663	-15.9802	10.4682
VT_NBS	Reluctant	Resistant	-1.48750	8.17610	.858	-19.0235	16.0485
		Voluntary	.21833	6.94835	.975	-14.6844	15.1211
	Resistant	Reluctant	1.48750	8.17610	.858	-16.0485	19.0235
		Voluntary	1.70583	6.94835	.810	-13.1969	16.6086
	Voluntary	Reluctant	-.21833	6.94835	.975	-15.1211	14.6844
		Resistant	-1.70583	6.94835	.810	-16.6086	13.1969
SF_NBS	Reluctant	Resistant	3.76250	8.11186	.650	-13.6357	21.1607

		Voluntary	1.39194	6.89375	.843	-13.3937	16.1776
	Resistant	Reluctant	-3.76250	8.11186	.650	-21.1607	13.6357
		Voluntary	-2.37056	6.89375	.736	-17.1562	12.4151
	Voluntary	Reluctant	-1.39194	6.89375	.843	-16.1776	13.3937
		Resistant	2.37056	6.89375	.736	-12.4151	17.1562
RE_NBS	Reluctant	Resistant	4.93667	7.69991	.533	-11.6980	21.5713
		Voluntary	-7.05778	6.05826	.265	-20.1459	6.0303
	Resistant	Reluctant	-4.93667	7.69991	.533	-21.5713	11.6980
		Voluntary	-11.99444	6.72104	.098	-26.5144	2.5255
	Voluntary	Reluctant	7.05778	6.05826	.265	-6.0303	20.1459
		Resistant	11.99444	6.72104	.098	-2.5255	26.5144
MH_NBS	Reluctant	Resistant	1.96500	7.63812	.801	-14.4171	18.3471
		Voluntary	-2.90611	6.49115	.661	-16.8282	11.0160
	Resistant	Reluctant	-1.96500	7.63812	.801	-18.3471	14.4171
		Voluntary	-4.87111	6.49115	.465	-18.7932	9.0510
	Voluntary	Reluctant	2.90611	6.49115	.661	-11.0160	16.8282
		Resistant	4.87111	6.49115	.465	-9.0510	18.7932
PCS	Reluctant	Resistant	1.76500	6.96857	.804	-13.2897	16.8197
		Voluntary	4.24722	5.48284	.452	-7.5977	16.0922
	Resistant	Reluctant	-1.76500	6.96857	.804	-16.8197	13.2897
		Voluntary	2.48222	6.08267	.690	-10.6586	15.6230
	Voluntary	Reluctant	-4.24722	5.48284	.452	-16.0922	7.5977
		Resistant	-2.48222	6.08267	.690	-15.6230	10.6586
MCS	Reluctant	Resistant	8.91000	5.51313	.130	-3.0004	20.8204
		Voluntary	-4.94667	4.33771	.275	-14.3177	4.4244
	Resistant	Reluctant	-8.91000	5.51313	.130	-20.8204	3.0004
		Voluntary	-13.85667*	4.81225	.013	-24.2529	-3.4604
	Voluntary	Reluctant	4.94667	4.33771	.275	-4.4244	14.3177
		Resistant	13.85667*	4.81225	.013	3.4604	24.2529

T-test comparison between two group means of the SF-36 and the GDS.

Group Statistics

	Group2	N	Mean	Std. Deviation	Std. Error Mean
PF_NBS	Involuntary	8	35.7700	12.93740	4.57406
	Voluntary	10	32.8630	8.50759	2.69034
RP_NBS	Involuntary	7	36.6271	5.09066	1.92409
	Voluntary	10	33.2020	7.02188	2.22051
BP_NBS	Involuntary	8	45.8700	12.40408	4.38551
	Voluntary	9	48.4700	14.08343	4.69448
GH_NBS	Involuntary	8	45.6375	9.06370	3.20450
	Voluntary	10	43.0590	10.92873	3.45597
VT_NBS	Involuntary	8	44.4288	11.42393	4.03897
	Voluntary	9	43.4667	10.96952	3.65651
SF_NBS	Involuntary	8	42.9262	12.11534	4.28342
	Voluntary	9	43.4156	10.26709	3.42236
RE_NBS	Involuntary	7	32.2943	4.23266	1.59979
	Voluntary	9	41.4678	12.52785	4.17595
MH_NBS	Involuntary	8	42.6925	10.78196	3.81200
	Voluntary	9	46.5811	10.17050	3.39017
PCS	Involuntary	7	40.4386	9.23509	3.49054
	Voluntary	9	36.9478	8.48407	2.82802
MCS	Involuntary	7	38.9514	6.78234	2.56348
	Voluntary	9	47.7167	8.19648	2.73216