PILOT STUDY SURVEY ATTRIBUTES OF CHIROPRACTIC PATIENTS OVER 55 YEARS OF AGE

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ABSTRACT

Objective: The purpose of this qualitative study was to develop a profile of attributes of older chiropractic patients.
Methods: An 18-question survey was distributed to 400 chiropractic patients through 80 different chiropractors' offices. Descriptive statistics were used to present data.
Results: The majority of respondents were 55-64 years of age (51.8%), female (63.6%), Caucasian (76.4%), living with others (82.1%), never been a smoker (58.2%), and taking 1-3 medications (51.9%). Most respondents were able to walk unimpaired (63.6%), able to care for themselves without assistance (98.2%), in moderate pain (85.5%), and not anxious (70.9%). Furthermore, they were able to drive themselves to doctor appointments (92.7%), reported back pain (76.8%), stated their health status was good overall (55.4%), and were receiving spinal/joint manipulation from their doctor (96.4%).
Conclusion: More than 75% of older chiropractic patients responded that they were Caucasian, living with others, reported no problems with self-care, had moderate pain, drove themselves to doctor appointments, reported back pain, and received spinal manipulation. Respondents appeared to be generally healthy and not frail. (*Chiropr J Australia 2017;45:11-28*)

Key Indexing Terms: Complementary and Alternative Medicine; Health Disparities; Chiropractic; Geriatrics; Frail Elderly

INTRODUCTION

Globally, the proportion of individuals over the age of 60 years is expected to increase from 10% to 22% by mid-century. (1) This increase in the older adult population will have significant societal implications in healthcare. This is particularly true for females, who comprise the greater percentage of the elderly population due to their longevity. (2) The cause of this significant increase in the older population is believed to be a combination of reduced mortality and increased population growth. (3-4)

The significant increase in population is straining the existing healthcare system and will raise the demand for primary care doctors through 2020. (5) Most of the noteworthy rise will be comprised of older adults. The Institute of Medicine has put forth a 3-part vision on how the healthcare system will have to adapt. (6) First, they recommend a patient-centered approach that focuses on prevention. Second, they advocate that care should be more efficient and less wasteful. Lastly, they recommend that older patients have an active role in their own care and in the decision-making process. (6)

Due to the projected rising number of elderly, Hawk et al (7) suggested that chiropractors should have a role on interdisciplinary geriatric healthcare teams. Borggren et al (8) followed their work and engaged in a review of syllabi for chiropractic college courses in geriatric health across North America. The intent was to better understand how well chiropractic students are being prepared to care for the elderly. They concluded that existing training at chiropractic colleges was insufficient, and that more class hours and greater experiential learning should be included in existing curriculum.

The purpose of this study was to develop a profile of older chiropractic patients to gain insight into particular data trends that may help chiropractors provide care for this special population.

METHODS

This pilot cross-sectional survey study was reviewed and approved by the Texas Chiropractic College (TCC) Institutional Review Board for human subjects in accordance with the Declaration of Helsinki.

Study Design

For this study, we chose to use mail-out surveys distributed through chiropractic doctors' offices. (9) These surveys were distributed between November 2014 and June 2015. Eighty doctors (Table 1) were each sent 5 anonymous self-addressed stamped surveys each to distribute to their patients over 55 years of age; thus, a total of 400 surveys were distributed. Researchers attempted to recruit doctors from the north, south, east, and west portions of the continental United States in large cities to provide a general representation of what a typical patient would be like. There were 20 doctors from Minneapolis MN, Houston TX, Charlotte NC, and Los Angeles CA. Completed surveys were mailed directly to the second author of this manuscript by the respondents. Researchers selected age 55 as the bottom cut-off for inclusion to help illustrate the changing needs of older adults as they age further.

Table 1. Attributes of the cities that distributed 100 total surveys each. Twenty chiropractors per city were provided with five surveys each to distribute, thus 100 surveys per city. US Census data reports do not list the number of persons 55 years and older, they start at 65 years of age on their tables.

n	City and State	County	2013 population estimate	Person's 65 years and older	Median household income	% below poverty line
100	Charlotte, NC	Mecklenburg	992,514	9.7%	$55,444	15.4%
100	Houston, TX	Harris	4,352,752	9.0%	$53,137	17.9%
100	Los Angeles, CA	Los Angeles	10,053,995	11.9%	$55,909	17.8%
100	Minneapolis, MN	Hennepin	1,200,060	12.2%	$64,403	12.8%

Instrument Development

The following surveys were reviewed during the development of the 18-question instrument used in this study: EuroQol-5D (EQ-5D)(10), Medicare Health of Seniors (HOS) survey-1998 version (11), Older People's Quality of Life Questionnaire (OPQOL) (12) Short Form-12 (SF-12) (13) Vulnerable Elders Survey-13 (VES-13) (14) and a cross-sectional CAM-use telephone survey. (15) The intent of this review was to choose the most informative questions possible from pre-existing surveys. Ultimately 12 of the 18 questions used in this survey were worded closely to pre-existing survey questions (#1, 2, 3, 4, 6, 9, 10, 11, 12, 14, 16, and 18).16-24 Table 2 displays the references that were used for each question of the survey in this study.

Table 2. Survey question resources/origins. Questions used in this survey were worded closely to those used in the below referenced sources.

Question # and source
1. Bair et al 2002 (16)
2. Barnett et al 2003 (17); Kuo et al 2004 (18); Graham et al 2005 (19)
3. Bair et al 2002 (16); Goldstein et al 2005 (20)
4. Kronenberg et al 2006 (21); Chao et al 2006 (22)
5. Developed through consensus
6. Bair et al 2002 (16)
7. Developed through consensus
8. Developed through consensus
9. Slight modification of EQ-5D mobility domain (10)
10. EQ-5D self-care domain (10)
11. EQ-5D pain/discomfort domain (10)
12. EQ-5D anxiety/depression domain (10)
13. Developed through consensus
14. American College of Sports Medicine (ACSM) guidelines for older adults (23)
15. Developed through consensus
16. Graham et al 2005;19 Kronenberg et al 2006 (21)
17. Developed through consensus
18. Scottish general health survey for older people (24)

The remaining questions were developed to determine information that might be important for a chiropractor. Individuals who live alone die younger than those who do not. (25) Question 5 was developed to include respondents living in a committed relationship with a same-sex partner, who might answer "no" to the question "Are you married?" The intent of question 7 was to determine the number of medications a typical patient might be using. This would have relevance to chiropractic college pharmacology courses. Question 8 was designed to investigate the form of advertising that prompted respondents to seek chiropractic care. Question 13 was intended to determine the means by which older

chiropractic patients arrived at their appointments, since the ability to drive safely is impaired by advancing age. (26-28) Question 15 was developed to determine the most common chief complaint that is affecting older chiropractic patients. Question 17 was created to elucidate the main forms of care provided to older patients by their chiropractors.

Question 9, although not a new question, was slightly reworded from the EQ-5D. (10) That instrument included the mobility option "confined to bed," which would be an unlikely choice for respondents completing this survey while physically present in the chiropractor's office. In addition, that survey had the mobility option "some problems in walking about" which was considered ambiguous because it did not reference a set distance. As a result, the researchers adapted the survey to more appropriately fit the population sampled by this study.

Lastly, questions 15, 17, and 18 allowed respondents to select multiple answers. For question 18 several examples of different health conditions were provided next to the selection options to help respondents choose the most appropriate answer/s.
Prior to implementation of the survey, it was sent to 4 practicing chiropractic peers for review. Following the incorporation of comments, the survey was pilot-tested by 6 respondents over 55 years of age to ensure face validity.

The final 3-page survey was printed on 1 side of the paper only, in order to prevent participants from missing questions that might be printed on the back of any page. Paper was chosen as opposed to being published online because researchers felt it would be more likely that older adults would not use the internet as often. The survey was kept short to increase the likelihood that respondents would answer all of the questions. (29) The survey was printed using Times New Roman size-16 font in order to include potential respondents with presbyopia. The beginning of the survey included identification of the researchers (their names followed by their degrees), identification of the college conducting the survey, a non-participation option statement, the purpose of the study, publication statement, instructions, and the actual 18 survey questions. Participants were not provided with any financial incentive to complete the survey.

Chiropractic Doctor Recruitment and Their Role

Doctors were initially recruited for this study through a mass e-mail sent by TCC's alumni department to doctors residing in cities. Additionally, 2 research assistants made several recruitment phone calls to doctors in the selected cities. Doctors were contacted based on the order of their website listing in the results of a search on Google (Mountain View CA, USA) using the keywords "chiropractor" and the given city name. Chiropractors who were contacted via e-mail were sent a copy of the survey for their review before they decided whether they wished to participate.

Table 1 lists the number of chiropractors per city that were recruited, their counties of residence, and US census data for those counties, including, 2013 population estimate,

percent of persons over 65 years of age, mean household income per county, and percent of the population with income below the poverty line. (30-33)

Approximately 200-220 chiropractic doctors were contacted to participate in this research study via email and telephone before 80 confirmed their desire to participate (36-40% success rate of doctor recruitment). The majority of doctors that did not agree to participate either failed to respond to emails or stated over the phone they were not interested in participating. The doctors that were involved in this study were not financially compensated for assisting with the project.

A manila envelope with 5 surveys and five self-addressed, stamped envelopes inside was immediately mailed to any doctor who agreed to participate in the study. The number of surveys mailed out per doctor was based on prior experience with mailed surveys. (9) The return envelopes used in this study were pre-printed with our college's address on both the outgoing and return address. The surveys themselves were also anonymous with no blank spaces for the participant's name or signature. The participating chiropractors were instructed to distribute up to 5 anonymous surveys randomly to patients aged 55 years or over during a 2-month data collection window. Researchers kept the inclusion criteria as simple as possible to increase the likelihood that field doctors would assist with this study. They were not required to mail back unused blank surveys. Postal employees stamp a letter with the state name when letters are traveling across states. Researchers purposefully were using this as a means of tracking from which state letters were mailed back.

All returned envelopes and data entry was processed by the second author to ensure uniformity. The cost of survey development, survey materials, postage, and all associated study expenses was provided by the principal investigator's institution.

All study applicants provided their implied consent if they filled out the survey, per the instructions listed on the survey.

Inclusion/Non-Responder Criteria

To qualify for the study, participants had to agree that they were ollder than 55 years, and currently receiving chiropractic treatment. Non-responder criteria were failure to complete the survey or lack of desire to participate. Inclusion/non-responder criteria were kept broad intentionally to increase the number of respondents.

Statistical Analysis

Survey results were entered into a table in Excel (Microsoft Corporation, Redmond, WA). Data were then exported and analyzed in SPSS version 20.0 (IBM, Armonk, NY). Descriptive statistics were used. In most of the results section the percentage values are followed by a colon and the actual number of positive respondents to the given question divided by the entire sample size for that given question.

RESULTS

Fifty-six of 400 surveys were returned, for a response rate of 14.0%. The response rates per city were as follows: Charlotte= 10, Houston= 31, Los Angeles= 6, Minneapolis= 6, and underdetermined= 3 (postal employees failed to stamp the letter with the state's identifier). Tables 3-4 list the demographic data of the respondents, the survey questions, and the possible responses. Additionally, on the original survey, questions #1, 2, 5, 7, and 14 had blanks for respondents to write answers. Data for the latter five questions were separated into manageable subcategories for interpretation (e.g., 55-64, 65-74, 75-84, and ≥85 years of age).

Table 3a. Survey responses to the 18-question instrument. These were the exact questions asked. However, the option groupings generated for questions #1, 2, 5, and 7 happened after the surveys were returned.

Attribute	n	Subgroup	% of n
1)How old are you (#)?_____ years	56		
55-64		29	51.79
65-74 (young old)		23	41.07
75-84 (old)		3	5.36
≥85 (old old)		1	1.79
2)What sex do you consider yourself ("male" or "female")?_____	55		
male		20	36.36
female		35	63.64
3)What is your race/ethnicity?	55		
White/Caucasian		42	76.36
Latino/Hispanic-American		5	9.09
Asian-American and Pacific Islander		1	1.82
African-American		4	7.27
Other		3	5.45
4)What is your highest level of education?	56		
less than high school		2	3.57
completed high school		12	21.43
2 years of college		15	26.79
college graduate or more		27	48.21
5)Do you live alone ("yes" or "no")?_____	56		
yes		10	17.86
no		46	82.14
6)Smoking status?	55		
current, if so how many packs a day?_____		3	5.45
former		20	36.36
never		32	58.18
7)How many different medications are you taking?_____	52		
0		11	21.15

1-3		27	51.92
4-6		8	15.38
7+		6	11.54
8)What made you choose the chiropractor you are seeing?	55		
on insurance plan		7	12.73
referral from a friend/family member		27	49.09
advertisement		2	3.64
referral from other health care provider		5	9.09
other (please specify):_____		14	25.45

Table 3a. Survey responses to the 18-question instrument cont.

Attribute	n	Subgroup	% of n
9)Which option describes your ability to walk several blocks?	55		
yes it is limited, a lot (cane/walker)		3	5.45
yes it is limited, a little		17	30.91
no it is not limited at all		35	63.64
10)Self-care	55		
I have no problems with self-care		54	98.18
I have some problems washing or dressing myself		1	1.82
I am unable to wash or dress myself		0	0.00
11)Bodily pain/discomfort	55		
I have no pain or discomfort		4	7.27
I have moderate pain or discomfort		47	85.45
I have extreme pain or discomfort		4	7.27
12)Anxiety/depression	55		
I am not anxious or depressed		39	70.91
I am moderately anxious or depressed		16	29.09
I am extremely anxious or depressed		0	0.00
13)How do you get to your chiropractic appointments?	55		
drive yourself		51	92.73
have a friend/family member drive you		2	3.64
walk		2	3.64
public transportation (bus/taxi/other)		0	0.00
14)How many days a week do you engage in 30 minutes of moderate physical activity (brisk walk, vacuuming, yard work)?_____ days a week.	56		
0		4	7.14
1-3		28	50.00
4+		24	42.86
15)What is the reason for you seeking care from your chiropractor? (circle all that apply)	56		
neck pain		28	50.00
back pain		43	76.79
headaches		8	14.55

arm or leg pain	15	26.79
other (please specify)_____	9	16.07

Table 3a. Survey responses to the 18-question instrument cont.

Attribute	n	Subgroup	% of n
16)Self-perceived health status?	56		
excellent		8	14.29
very good		17	30.36
good		31	55.36
fair		0	0.00
poor		0	0.00
17)What type of care does your chiropractor provide you with? (circle all that apply)	56		
spinal manipulation/joint manipulation		54	96.43
nutritional advice		20	35.71
rehabilitation exercise/physical activity advise		30	53.57
balance training		4	7.14
soft tissue massage		24	42.86

Table 3b. Survey responses to the 18-question instrument cont.

Attribute	n	Subgroup	% of n
18)Do you have health issues that fit the below areas? (circle all that apply)	56		
musculoskeletal (fibromyalgia, rheumatoid arthritis, gout)		20	35.71
heart and circulatory system (heart failure, high blood pressure)		25	44.64
endocrine & metabolic (hypothyroidism, diabetes)		16	28.57
respiratory system (asthma, emphysema, bronchitis)		8	14.29
digestive system (irritable bowel syndrome, constipation, reflux)		13	23.21
eye complaints (glaucoma, near-sighted, cataract, macular degeneration)		14	25.00
ear complaints (hearing problems, vertigo)		5	8.93
neoplasms & benign growths		2	3.57
nervous system (Parkinson's disease, multiple sclerosis)		2	3.57
genito-urinary system (incontinence)		1	1.79
skin complaints (dermatitis)		5	8.93
other complaints:____		4	7.14

The survey found that the majority of the respondents were between 55-64 years of age (51.8%:29/56), female (63.6%:35/55), Caucasian (76.4%:42/55), a college graduate (48.2%:27/56), living with someone (82.1%:46/56), never been a smoker (58.2%:32/55), and taking 1-3 medications (51.9%:27/52). In addition, most participants: chose their chiropractor based on referral from a friend or relative (49.1%:27/55), did not report any restrictions on their ability to walk several blocks (63.6%:35/55), reported no problems with self-care (98.2%:54/55), reported moderate pain or discomfort (85.5%:47/55), did not report anxiety (70.9%:39/55), drove themselves to chiropractic appointments (92.7%:51/55), engaged in 1-3 days a week of moderate physical activity (50.0%:28/56), chose back pain as the most common reason for chiropractic visits (76.8%:43/56), and rated their health as “good” (55.4%:31/56).

Table 4. ”Other” category responses to questions #8, 15, and 18. A number to the side of responses refers to the frequency of that given response.

Question #8 "other" responses:
met the DC at a workshop/health fair (3)
they live close to the DC's office (1)
they moved and needed a new DC (1)
DC was near their job (1)
MD did not help (1)
former DC died (1)
met DC at an exercise class (1)
saw the DC's Groupon® ad (1)
referred by their MD (1)
saw the DC's phonebook ad (1)
left it blank (2)

Question #15 "other" responses:
maintenance care (2)
numb hands
hip pain (4)
Fatigue
left it blank (2)

Question #18 "other" responses:
osteoporosis and hypothyroid (1)
bone spur in neck (1)
leukemia (1)
high cholesterol (1)

Further, 96.4% (54/56) of respondents received manual manipulation, 35.7% (20/56) received nutritional advice, 53.6% (30/56) received rehabilitation exercise or physical activity advice, 7.1% (4/56) received balance training, and 42.9% (24/56) received soft tissue massage from their chiropractic provider. The three primary comorbid health conditions reported were: heart and circulatory issues (44.6%:25/56), musculoskeletal issues (35.7%:20/56), and endocrine & metabolic issues (28.6%:16/56).

Only 5.5% (3/55) of respondents reported that they currently smoke, with an average consumption of 2/3rds of a pack of cigarettes a day.

DISCUSSION

The findings of the study indicated that respondents were primarily (greater than 75% of the time) healthy and independent.

Older adults are often prescribed multiple medications. (34,35) In this study, respondents reported being prescribed 2.6 $\pm$ 2.9 (mean $\pm$ SD) medications. These values were actually

less than existing data from other researchers. A study by Kaufman et al (36) found that 50% of adults age 65 and older take 5 or more medicines per week. As adults age, they typically experience a cognitive decline, which has been shown to impair their ability to properly adhere to a medication regimen (37,38), a mental issue that older adults are often reluctant to admit. (39) Lack of adherence to a medication schedule can have a significant negative impact on senior health. Chiropractic doctors should ask their older patients about medication use and attempt to discern if they are following their prescription accurately in an attempt to co-manage.

Most respondents reported that a referral from a friend or family member was the primary reason to schedule an appointment with their current chiropractor. This is similar to the existing research within the general population. (40)

Approximately 36.4% (20/55) of respondents stated that they did have mobility restrictions. The role of chiropractic in improving mobility and the most optimal forms of manipulation to increase mobility should be studied further due to a paucity of research on this topic. Spinal manipulation has been shown to positively impact step length and stride length; however, this research was performed on participants under 46 years of age. (41)

Most respondents did not have issues with self-care (98.2%:54/55). However, the majority reported moderate bodily pain or discomfort (85.5%:47/55). Spinal manipulation has been shown to reduce pain (42) and may benefit older patients.

A significant number of older chiropractic patients in this study suffered from moderate anxiety/depression (29.1%:16/55). Anxiety rates for older adults is cited at 15% to 20%, but they increase to 40% for those with disabilities or chronic medical conditions. (43) Blazer and Williams (44) found that 14% to 20% of elderly experience depressive symptoms. The impact of spinal manipulation and chiropractic care on anxiety (45) and depression is an area that has minimal research. It is unclear why anxiety and depression were higher in this study compared to others.

Most respondents reported that they drove themselves to their chiropractic patient visits (92.7%:51/55). As participants age their capacity to safely drive could be an issue as it would impact their ability to travel to their doctor's office and receive care. Most respondents reported engaging in 30 minutes of moderate physical activity on 3.5 $\pm$ 2.1 days a week. This does not meet the recommended minimum of 150 minutes of moderate physical activity a week suggested by the Centers for Disease Control and Prevention. (46)

The main 2 reasons that older chiropractic patients reported receiving treatment were back and neck pain. This supports earlier investigations on the general public in which neck pain and back pain were revealed to be conditions commonly treated by chiropractors. (47) The self-perceived health status of all chiropractic patients in this study was good to excellent. The reason why no respondents reported "fair" or "poor" is unclear and may

represent self-selection of respondents or a desire to support this study specifically or chiropractic in general.

Most respondents reported receiving spinal and/or joint manipulation, which is consistent with the nature of the profession. Some respondents (35.7%:20/56) reported receiving nutritional advice. Chiropractors are in a position to impact their senior patients' health through nutritional consultations, depending on the scope of practice of the state in which they work. For example, chiropractors could discuss the link between low vitamin D levels and fall risk with their patients (48), or the importance of consuming enough calcium to help prevent osteoporosis. (49)

Frailty is associated with reductions in strength, energy level, and walking velocity. (50,51) The development of frailty amongst the elderly can be offset by regular participation in an exercise program. (52) This survey demonstrated that only 53.6% (30/56) of older adult chiropractic patients reported receiving rehabilitative exercise or physical activity advice at their chiropractors' office.
Elderly are prone to falling from a standing height, which is a common cause of traumatic brain injury (TBI) (53), hip fracture (54), and trauma to other regions of the body. The cause of falls can be physiologic (decline in balance with aging), environmental (slippery floor), or situational (a person tries to catch something and falls). (55) The results of this survey demonstrated that only 7.1% (4/56) of chiropractic patients over the age of 55 years reported receiving balance training from their chiropractor. Considering the prevalence of falls amongst the elderly, this should be an issue that receives more attention in practice. (56)

Many patients in this study (42.9%:24/56) reported receiving soft tissue massage at their chiropractic doctor's office. Massage can be a form of care to reduce muscle tension for patients. (57)

As humans age, they will often develop multiple co-morbidities at the same time (58), particularly toward the end of life. (59) This phenomenon was noted in this study as well. Thirty-five out of 56 participants (62.5%) reported multiple health conditions. Multiple morbidities are a predictor of hospitalization (60), low quality of life (61), depression (62), and disability. (63)

Chiropractors may play a significant role in healthcare teams that provide care for older adults. Fourteen percent of chiropractic patients in the United States are 65 years of age or older (64), and musculoskeletal conditions are a leading causes of disability amongst the elderly. (65) Chiropractic doctors do receive sufficient training in geriatric care as part of their educational curriculum. (64,66) Furthermore, several leading chiropractic researchers have worked together to develop treatment guidelines for the care of older chiropractic patients. (67) The unique role that chiropractors have in the care of older adults should be maximized to increase their utilization in healthcare teams.

It could be argued that the relatively healthy attributes observed of patients in this study are reflective of the health-conscious older individuals that see chiropractors. Aronow (68)

and Gleberzon (69) both have made a similar argument, that older adults that want to become chiropractic patients are generally healthy and proactive in their health habits.

Limitations

The primary limitation of this pilot study was the low response rate. As a result, a broader and larger survey study would be more informative of data trends within this special population.

Due to the limited distribution of this survey in four large cities the findings are most representative of urban areas and not necessarily rural areas.

This is the first time that this survey has been distributed and it is possible that some questions were not as optimal as possible. Extensive internal debate occurred with the design of this survey due to researchers wanting to limit the survey to no more than the 18 most informative questions. Additional questions that were considered were “income,” “health insurance status,” and “marital status.” Ultimately, researchers decided not to ask about income because they felt likely it would be low (i.e. a significant portion of respondents might be on social security) and would not be as informative. Health insurance status was not asked because likely many older respondents would cite they used Medicare. Marital status was not asked as already mentioned because researchers did not want to discriminate against same-sex couples.

Researchers were not able to block sampling bias on behalf of the field doctor or response bias by the patient. For example, with sampling bias a chiropractic doctor might choose to give the survey to patients that were very pro-chiropractic. With response bias a patient might feel compelled to provide more socially appropriate responses instead of their true viewpoint.

CONCLUSION

Greater than 75% of older chiropractic patients responded that they were white, living with others, reported no problems with self-care, had moderate pain, drove themselves to doctor appointments, reported back pain, and received spinal/joint manipulation. This indicates that highly functional older adults seek chiropractic care for moderate aches and pains. Further research into the appropriate management of this population is essential to optimize healthcare for the increasing number of older adults, globally. Future studies evaluating how to reduce the burden on the healthcare system and improving patient care are a necessity.

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