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Predicting the Trajectories of Perceived Pain Intensity in Southern Community-Dwelling Older Adults: The Role of Religiousness

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Abstract

This study focuses on the identification of multiple latent trajectories of pain intensity, and it examines how religiousness is related to different classes of pain trajectory. Participants were 720 community-dwelling older adults who were interviewed at four time points over a 3-year period. Overall, intensity of pain decreased over 3 years. Analysis using latent growth mixture modeling (GMM) identified three classes of pain: (1) increasing ($n = 47$); (2) consistently unchanging ($n = 292$); and (3) decreasing ($n = 381$). Higher levels of intrinsic religiousness (IR) at baseline were associated with higher levels of pain at baseline, although it attenuated the slope of pain trajectories in the increasing pain group. Higher service attendance at baseline was associated with a higher probability of being in the decreasing pain group. The increasing pain group and the consistently unchanging group reported more negative physical and mental health outcomes than the decreasing pain group.

Keywords

pain trajectory; religiousness; latent growth modeling

Chronic physical pain is a global issue affecting the general population and older adults in particular. Van Den Kerkhof, Hopman, Towhead, Anastassiades, and Goldstein (2003) reported the prevalence of chronic pain to be 17% in the Canadian general population, a percentage that increased with age. In the United Kingdom, the prevalence of chronic pain

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in the general population was estimated as high as 46.5% (Elliott, Smith, Penny, Smith, & Chambers, 1999). Older age was also found to predict a higher prevalence of pain in the Scottish population (Smith et al., 2001). In the United States, chronic pain affects nearly half of the adults aged 65 and older (Dunn & Horgas, 2004; Yu, Tang, Kuo, & Yu, 2006). For example, Dunn and Horgas (2004) reported that older adults were seeking solutions for their pain to enable them to perform necessary everyday activities with less difficulty. Many older adults also minimize their pain as a necessary adjustment to growing old (Hooyman & Kiyak, 2011). When not effectively managed, pain can negatively affect physical, mental, and spiritual well-being.

Religiousness and Pain

There is an increasing body of literature focusing on the role of religiousness in physical pain management (Dunn & Horgas, 2004; Moreira-Almeida & Koenig, 2008). Barnes, Powell-Griner, McFann, and Nahin (2002) report that three of the five most utilized alternative healing treatments in the United States were related to religious coping in the form of prayer including prayer for oneself (43%), prayer for others (24.4%), and participation in a prayer group (9.6%). Individuals with chronic pain were found to be more likely to use religiousness as a coping method than the general population (Baetz & Bowen, 2008). For example, Glover-Graf, Marini, Baker, and Buck (2007) reported that 61% of adults, with a mean age of 50.5 ($SD = 11.6$), who had chronic pain used prayer as a coping strategy. Spirituality/religiousness relates to positive appraisals and adaptive coping (Büssing et al., 2009), which may in turn influence biological mechanisms impacting pain (Rippentrop, Altmaier, Chen, Found, & Keffala, 2005).

However, studies that have investigated the relationship between pain and religiousness have yielded mixed results. One study of arthritis patients, with a mean age of 55.9 ($SD = 13.5$) found no effect of religious coping on pain (Abraido-Lanza, Vasquez, & Echeverria, 2004). Some studies found that religiousness/spirituality may not directly affect feelings of pain, but is positively related to mental well-being. For example, Skevington, Carse, and Williams (2001) assessed adult patients reporting chronic pain in a 16-day inpatient pain management program. While religiousness/spirituality was positively correlated with mental health, it was not significantly related to any measure of pain. A similar result was found in rheumatoid arthritis patients who kept a diary over a 30-day period documenting pain, daily religious experiences, and religious/spiritual pain coping (Keefe et al., 2001). Although perceptions of daily pain were not affected, mood and social support were positively related to spiritual experiences.

More evidence suggests a positive effect of religiousness on pain (Rippentrop, 2005). Turner and Clancy (1986) used the Coping Strategies Questionnaire (CSQ) along with the completion of a 1-week pain diary to assess pain and spiritual coping over time. Two religious constructs of the CSQ, the *Diverting Attention and Praying* strategy and the *Praying and Hoping* strategy, were significantly related to a decrease in average pain experienced by participants. A later study (Vandecreek et al., 2004), using the same CSQ, identified a moderate positive relationship between religious coping and pain management in a sample of adults with arthritis pain.

The mixed results regarding the role of religiousness in perceptions of pain may stem from differences in the demographic makeup of the sample, and/or the instruments used to measure religiousness/spirituality (Rippentrop, 2005). For example, utilizing religious coping methods to deal with pain was found to be more prevalent in older women and minority samples (Dunn & Horgas, 2004). Tait, Laditka, Laditka, Nies, and Racine (2011; $N = 10,096$) found that women were nearly twice as likely to pray for their health than were

men, and studies by Keogh, McCracken, and Eccleston (2006), Breivek et al. (2006), and Jinks, Jordan, and Croft (2002) found that females tended to report more pain than their male counterparts. With regard to race, Edwards, Doleys, Fillingim, and Lowery (2001) reported that African Americans reported higher levels of clinical pain and less pain tolerance as compared to their White counterparts. In a study by Krause and Chatters (2005) with a nationally representative sample of older adults, African Americans were significantly more engaged in prayer activities than older non-Hispanic Whites, even when controlling for demographic factors and denominational preference.

The variation in results may also be a function of the variety of instruments used to measure religiousness. For the purpose of this study, we view religiousness as a multidimensional concept that encompasses organizational religiousness (OR), non-organizational religiousness (NOR), and IR (Koenig, Meador, & Parkerson, 1997). OR includes religious activities in group settings such as church attendance and participation in religious events; NOR refers to religious activities practiced in private settings such as prayer or meditation; and IR reflects the perceived importance of religious values to an individual's life.

Each of these religious domains may have a different effect on pain. Pain was found in most cases to be positively related to prayer (i.e., NOR) in Koenig's (2001) review of literature, although most of these studies were cross sectional. Harrison et al. (2005) examined the relationship between religiousness and pain in adults, with a mean age of 36.8 ($SD = 12.1$), with sickle cell disease. NOR and IR were not correlated with pain measures in this population. However, those who reported attending church services at least once per week experienced significantly lower pain intensity (Harrison et al., 2005). In another study (Baetz & Bowen, 2008) using the Canadian Community Health Survey 2002 with a sample size of 37,000 people aged 15 and older (mean age = 44 ± 3.5), both religious attendance and intrinsic religiosity were found important on managing chronic pain. Individuals who reported spiritual values to be important to their lives and attended worship services at least once a month were less likely to experience chronic pain than those who did not. Though inconclusive, such cross-sectional evidence suggests that future pain studies need to clarify the effects of different dimensions of religiousness on pain intensity over time.

Trajectories of Pain in Older Adults

Even though a higher prevalence of pain has been reported in elderly populations (Dunn & Horgas, 2004; Smith et al., 2001; Van Den Kerkhof, Hopman, Towhead, Anastassiades, & Goldstein, 2003), no previous work has specifically examined trajectories of change in pain over time in the older population living in community settings. Most studies examining the trajectories of pain have been done in conjunction with medical interventions to assess the effectiveness of pharmaceutical treatments (Ingham, Seidman, Yao, & Portenoy, 1996) or the use of palliative care measures (Caraceni et al., 2002). Identifying distinct pain trajectories may provide information about the course of pain in the elderly and the factors that affect it (Dunn, Jordan, Mancl, Drangsholt, & LeResche, 2011). Such information will be useful in helping professionals target interventions to older adults with pain trajectories that lead to more serious health/mental health outcomes.

Given the importance of studying pain trajectories in older populations, this study seeks to (1) identify the latent trajectories of pain intensity; (2) examine how different dimensions of religiousness are related to different pain trajectories; and (3) associate the pain trajectories with the health and mental health outcomes.

Method

This study used data from the University of Alabama at Birmingham (UAB) Study of Aging. The UAB Study of Aging is a population-based, prospective study of community-dwelling older adults. The baseline sample consisted of 1,000 adults aged 65 years and older from a list of Medicare beneficiaries in five Alabama counties. The sample was stratified by county, race, and gender, and included balanced numbers of Black men and women and White men and women (for details on the research design, see Allman, Sawyer, Maisiak, Sims, & Roseman, 2004; Allman, Sawyer, & Roseman, 2006). Baseline interviews were conducted in the participants' homes; follow-up interviews at years 1, 2, and 3 were conducted by telephone. The current study examined baseline data and three waves of follow-up data collected annually from 1999 to 2002.

Participants

Seven hundred and twenty participants who completed four waves of assessment comprised the sample (see Table 1). Compared to those who completed all four waves, participants who did not complete the study were more likely to be male and of older age; report lower scores on church attendance and prayer at baseline; have lower cognitive status; higher depression scores; and more physical functioning limitations. There was no difference in self-reported pain intensity between these two groups.

Measures

Pain intensity was assessed by self-reported severity of pain over the past 4 weeks on a 5-point Likert-type scale: *no pain* (0), *annoying* (1), *uncomfortable* (2), *dreadful* (3), and *agonizing* (4). About a quarter (25.3%) reported no pain at baseline, 20% reported annoying pain, 31.1% reported uncomfortable pain, 6.1% reported dreadful pain, and 17.5% reported agonizing pain.

Religiousness—Religiousness was measured using a slightly modified version of the Duke University Religion Index (Koenig et al., 1997). This is a 5-item measure of the three major dimensions of religiousness: OR, NOR, and IR. The survey asked the exact same five questions as in the original scale except for a minor change on the NOR. NOR was measured by the frequency of private religious activities such as prayer, meditation, or individual Bible study on a scale from 1 = *never* to 6 = *more than once a week*, while the original scale was worded as 1 = *rarely or never* to 6 = *twice or more daily*. OR was measured by a single item, scored from 1 = *never* to 6 = *more than once a week* on attendance at religious services or other religious meetings. IR was measured using the summed scores of 3 items. Participants indicated how true each of the following statements was for them using a 5-point scale from 1 = *definitely not to be true* to 5 = *definitely true of me*: “In my life, I experience the presence of the Divine” (i.e., God); “My religious beliefs are really what lie behind my whole approach to life;” and “I try hard to carry my religion over into all other dealings in life.” Scores on the IR scale ranged from 3 (*low intrinsic religiousness*) to 15 (*high intrinsic religiousness*). Cronbach's α for the IR scale at baseline was .83.

Physical health—Physical health was measured using a self-rated scale ranging from 0 = *poor* to 4 = *excellent*. Physical functioning was measured by assessing difficulties with performing activities of daily living (ADL), such as dressing and eating, and the instrumental activities of daily living (IADL), such as cooking and doing laundry (Kovar & Lawton, 1994). The number of ADL difficulties ranged from 0 to 7 (Cronbach's α at baseline = .83) and the number of IADL difficulties ranged from 0 to 6 (Cronbach's α at baseline = .76).

Cognitive status was assessed using an adapted version of the Mini Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975). One adaptation is that participants were asked to recall their own home address (i.e. street, city, state, and telephone number) rather than the information of county, township, building, and floor of the assessment at this time. Another adaptation is that respondents were asked to spell WORLD backward rather than answering the serial mathematic questions. The Cronbach's α of MMSE at baseline was .82. Emotional well-being was indicated by depressive symptoms and levels of anxiety. The short form of the Geriatric Depression scale (GDS; Sheikh & Yesavage, 1986) was used to assess depressive symptoms. Scores can range from 0 to 15; a score of 6 or higher indicates possible depression and the need for a more comprehensive assessment (Aikman & Oehlert, 2001). The Cronbach's α at baseline was .73. Anxiety was measured by the 5-item affect subscale derived from the Arthritis Impact Measure (AIM; Ren, Kazis, & Meenan, 1999). The AIM has a range from 5 to 25, with higher scores indicating higher levels of anxiety. The Cronbach's α at baseline was .84.

Sociodemographics—Sociodemographic variables included age, gender (1 = *female*; 0 = *male*), ethnicity (1 = *Black*; 0 = *White*), and residence (1 = *rural*; 0 = *urban*).

Statistical Analyses

We used GMM to examine trajectories of pain intensity change over time. The GMM approach assumes the unobserved heterogeneity in the sample. That is, individuals in different groups have class-specific population distributions (Muthén, 2004). The GMM classifies the entire population into several distinct subpopulation-specific trajectories based on the principle of the maximum likelihood estimation and allows for within-class variation. Our model setting of GMM with predictors and outcomes is shown in Figure 1. As described in Muthén and Shedden (1999), incorporating covariates in GMM rather than using the pain measures alone provides a more general and realistic modeling framework in the sense that the class membership probability and the growth curve coefficients are allowed to be influenced by covariates.

We started with a one-cluster solution, assuming the population was a homogenous group, and increased the number of classes until we identified the best cluster solution. The best cluster solutions may be achieved with low values of Bayesian information criterion (BIC), and high entropy values (Muthén & Méthen, 1998–2010). The entropy values range from 0 to 1, with a value closer to 1 indicating a better quality of the classification.

In deciding the optimal number of classes, we also used the bootstrap likelihood ratio test (BLRT) to compare model performances between the current model (k) and the model with one less class ($k - 1$). The superior performance of BLRT has been proven in simulation studies (Nylund, Asparouhov, & Muthén, 2007). In addition, we examined the posterior probabilities to determine the optimal number of classes. The matrix of posterior probabilities (range 0 to 1) presents the conditional probabilities for cases to be in their respective class; higher diagonal values indicate better classification. The GMM models were run using Mplus 5.2 (Muthén & Muthén, 1998–2010).

Participants were classified into multiple groups of distinct trajectories based on starting values of pain intensity, change in pain intensity, religiousness, and demographics. When the best fitting model with the optimal number of groups was chosen, we conducted analysis of variance (ANOVA) tests to examine the differences across the identified groups in their physical health and mental health indicators during the 3-year period.

Results

An analysis of the pain intensity at baseline found that about 75% of the sample reported having pain, and about a quarter of the sample reported their pain to be dreadful and agonizing. We plotted the observed pooled means of pain intensity over time (see Figure 2). Over the 3 years, pain intensity declined the first year and remained steady thereafter, assuming that individuals have the same population distribution. Since this approach does not take into account the subgroup heterogeneity in the population, we classified the entire group into multiple classes using GMM.

Classes of Pain Trajectories

In order to determine the optimal number of classes, we estimated the linear models of one class through five classes. Based on multiple criteria, the three-class model was favored (BIC = 8349.96; entropy = .98; BLRT = $p < .001$) over the two-class model. Additionally, the conditional probabilities for the three-class model indicated good classification quality with the diagonal values of all three being .99.

As a result of the GMM, we identified three distinct groups. Figure 2 also shows the means of pain intensity weighted by estimated class probabilities of the three classes over 3 years with four time points. About 53% of participants belonged to the decreasing group ($n = 381$) in that individuals started with low intensity of pain and the intensity further decreased over time. The steady group consisted of 40.5% of the sample ($n = 292$); individuals in this group had uncomfortable pain at baseline and the intensity remained stable over time. The increasing group included about 6.5% ($n = 47$) of people whose pain sharply increased over the 3-year period.

The Role of Religiousness

Table 2 presents the influence of religiousness on the intercept and the slope of each trajectory of pain intensity, controlling for demographics (i.e., age, gender, race, and rural residence). A significant effect of religiousness was only identified in the increasing pain group. Within the increasing pain group, higher levels of IR were associated with higher levels of pain at baseline; however, IR predicted a slower increase in pain intensity over time. None of the three religiousness dimensions was a significant predictor of baseline pain or rate of change in pain for the steady pain group or for the decreasing pain group. In the steady group, African Americans were likely to have more intense pain at baseline. In the decreasing group, women tended to have more intense pain than men at baseline.

To further understand the profiles of the three classes, we examined the extent to which each predictor influenced class membership. Table 3 presents the association between predictors and class membership in reference to the decreasing pain group. Lower levels of religious attendance (OR = .64, $p < .001$) and female gender (OR = 2.69, $p < .05$) increased the likelihood of being classified in the increasing pain group compared to the decreasing pain group. Females were one and a half times (OR = 1.51, $p < .05$) more likely to be classified in the steady pain group compared to the decreasing group.

Pain Class and Physical and Mental Health Indicators at the Fourth Year

We further examined the differences in the three groups in their physical and mental health outcomes at the fourth year (see Table 4). The increasing pain group tended to have the most negative physical and mental health outcomes at the fourth year. The increasing pain group reported the worst self-rated health, the largest number of ADL and IADL difficulties, and the lowest cognitive scores. Furthermore, this increasing pain group had the highest anxiety scores and most depressive symptoms.

Discussion

Chronic pain, commonly experienced by older adults, is a primary reason for seeking medical care. Despite the use of prescription and over-the-counter pain medications, older individuals tend to rely on non-pharmaceutical approaches to deal with pain (Sawyer, Bodner, Ritchie, & Allman, 2006). The current study represented an initial effort to examine the trajectories of pain in a community-dwelling older population, examining the role of religiousness. We found distinctly different patterns of change in pain intensity over time. Slightly more than half of the sample showed a pattern of decreasing pain intensity, while just over 40% showed a steady or relatively constant level of pain intensity over time, and about 7% showed a pattern of increasing pain.

The role of religiousness is not one-dimensional. Lower levels of church attendance at baseline predicted greater likelihood of membership in the increasing pain group versus the decreasing pain group. This suggests that older adults who attended church services less frequently at baseline were more likely to fall into the trajectory of increasing pain over time. In light of previous evidence supporting the benefits of church attendance for older adults with chronic pain (Harrison, et al., 2005; Koenig, George, & Peterson, 1998), we believe that church is a place that provides older adults with access to religious and peer support and other services that might provide comfort and other benefits in a wide range of areas. Being an active member in a faith-based community may also facilitate a sense of belonging, reduced negative emotions, and improved self-efficacy. However, another possibility is that lower religious service attendance at baseline could have resulted from previously experienced higher levels of pain, which set the trajectory of the two groups (i.e., increasing group and decreasing group) apart from one another.

IR was salient in the increasing pain group. IR may be able to motivate and empower people in stressful life situations, such as suffering from high intensity pain. For those whose pain showed an increasing pattern over time, levels of IR at baseline predicted a less rapid increase in pain over time. The essence of IR is the perceived importance of religiousness to one's life, and this may be less restricted by one's physical limitations compared to church attendance. Although some people may have to reduce their church attendance due to increasing pain, higher IR may slow down the increase in pain intensity.

There was no significant relationship found between NOR and pain trajectories. We suspect that prayer needs to be examined along with other forms of coping to capture its influence on perceptions of pain. For example, prayer was paired with another construct in the CSQ, such as the *Diverting Attention and Praying* or the *Praying and Hoping* strategies, which predicted a decrease in pain (Turner & Clancy, 1986). In light of Bush et al.'s (1999) findings regarding distinctive effects of positive and negative religious copings on affect, it is possible that negative religious coping can be channeled through prayer.

Consistent with previous literature (Hunter, 2001), female gender was found to predict membership in the increasing and the steady pain intensity groups. This may be due to the fact that females tend to report more consistent pain compared to males (Bruno, Michel, Barberger-Gateau, & Dartigues, 1998), and/or males are more likely to accept the presence of pain over time (Cook & Chastain, 2001). For the decreasing pain group, gender did not predict the change over time, although females had higher pain intensity at baseline.

Clinical and Future Research Implications

It appears that all three pain groups deserve differential research and clinical attention. The increasing pain intensity group needs to be identified in community outreach and brought to the attention of health professionals, since that group had the most negative physical and

mental health outcomes. Poor health, physical disabilities, and depressive feelings may pose additional challenges, which in turn, exacerbate the experience of pain. Although church attendance and intrinsic religiosity cannot be prescribed, many older adults who are already engaged in a religious community to some extent need help alleviating barriers to access (transportation, etc.). Furthermore, we concur with Wachholtz, Pearce, and Koenig (2007) who suggested that clinicians try to recreate what being part of a faith-based community accomplishes for those with chronic pain, but in a therapeutic environment.

The steady pain group also deserves attention. This group had relatively low pain intensity compared to the increasing pain group, but their pain remained at a persistent somewhat high level over time. In particular, Black older adults in this steady group had higher levels of pain than their White counterparts. Understanding why this is the case is a future research priority. Future studies focusing on the decreasing group could help us further pinpoint how religiosity has worked for this group who maintained a downward trend of pain trajectory; such understanding may lead to preventive measures to be created to help older people in pain.

Limitations

The limitations of this study should also be noted. First, the experience of pain may contain biological, social, and psychological aspects (Harrison et al., 2005). Such a multidimensional experience cannot be fully captured by the single-item assessment of general pain used here. Although this question did not associate pain with a particular source, based on what is known about pain in the elderly, it is likely that the primary sources of pain came from arthritis and back pain. Nearly 60% of study participants had arthritis in various forms, with over one-third reporting low back pain. Other participants may have had acute pain rather than chronic pain which would, by definition, decrease over time. Second, although we have a multidimensional assessment of religiousness, we did not have a measure of spirituality or religious coping. Although church attendance might involve religious framing and coping, specific assessment of religious coping behaviors might help to reveal the mechanisms by which religiousness influences pain. Other possible confounding variables of pain experience including access to medical care were not available in the data set and thus were not controlled.

Conclusion

Chronic pain is a significant problem affecting many aspects of life in older adults. This study, based upon a gender and racially balanced sample living in a state in the “Bible Belt,” identified three different trajectories of pain. The three pain groups generated differential research and practice implications. Given the fact that older women were less likely than older men to follow a decreasing pain trajectory, we recommend careful monitoring of pain changes in older women and the use of gender sensitive assessment tools in older men, who may underreport pain that then goes untreated. Non-pharmacological interventions that include a religious component may help many older people who are already religious manage their pain better.

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Figure 1.

Growth mixture model of pain. *Note.* y_1 through y_4 are longitudinal measures of pain, which are directly influenced by the intercept and slope parameters of the growth curve of pain. Class membership and predictors determine growth curve parameters. The class membership is influenced by predictors and affects the health/mental health outcomes.

Figure 2.
Means of pain intensity weighted by estimated class probabilities.

Table 1

Characteristics of Participants Who Completed Four Waves and Those Who Dropped Out

	Participants in study (<i>n</i> = 720)	Participants dropping out of the study (<i>n</i> = 280)
	Mean (<i>SD</i>)/Percentage	Mean (<i>SD</i>)/Percentage
Age **	74.1(5.64)	77.1(6.26)
African American	49.4%	51.4%
Female **	53.8%	40%
Rural	51.7%	50.7%
Church attendance **	3.6(1.41)	3.0(1.50)
Prayer **	4.5(1.10)	4.3(1.36)
Intrinsic religiousness	14.1(1.92)	14.0(2.17)
Pain intensity	1.7(1.37)	1.8(1.49)
MMSE **	25.8(4.13)	22.0(5.90)
Depression **	2.1(2.21)	3.0(2.52)
Anxiety	19.5(4.04)	19.3(4.41)
IADL **	.9(1.35)	1.6(1.72)
ADL **	1.0(1.68)	2.0(2.09)

Note.

**
p < .01.

Table 2

Class Specific Estimates on Pain Intensity

	Increasing (<i>n</i> = 47) <i>B</i> (<i>SE</i>)	Steady (<i>n</i> = 292) <i>B</i> (<i>SE</i>)	Decreasing (<i>n</i> = 381) <i>B</i> (<i>SE</i>)
Intercept on			
Church attendance	−0.16 (.12)	−0.06 (.08)	−0.10 (.06)
Prayer	0.07 (.17)	−0.01 (.08)	0.06 (.06)
Intrinsic religiousness	0.50 (.18) **	0.05 (.05)	0.01 (.03)
Age	0.01 (.03)	−0.01 (.01)	0.02 (.02)
African American	−0.04 (.36)	0.27 (.14) *	0.12 (.12)
Female	−0.38 (.35)	0.27 (.14)	0.27 (.12) *
Rural	−0.18 (.31)	0.25 (.18)	0.17 (.13)
Slope on Church attendance	0.05 (.05)	0.02 (.02)	0.03 (.03)
Prayer	0.02 (.06)	0.01 (.03)	−0.02 (.02)
Intrinsic religiousness	−0.18 (.06) **	−0.02 (.01)	0.01 (.01)
Age	0.01 (.01)	0.01 (.01)	−0.01 (.01)
African American	0.01 (.14)	−0.08 (.05)	−0.04 (.04)
Female	0.16 (.13)	−0.09 (.05)	−0.08 (.04)
Rural	0.19 (.13)	−0.05 (.05)	−0.05 (.05)

*
p < .05.

**
p < .01.

Table 3 Association Between Predictors and Class Membership^a

Predictors at baseline	<u>Increasing</u>	<u>Steady</u>
	Odds ratio	Odds ratio
Church attendance	0.64 ***	0.91
Prayer	1.10	1.05
Intrinsic religiousness	1.19	1.01
Age	1.01	1.01
African American	1.02	1.33
Female	2.69 *	1.51 *
Rural	1.98	1.12

Note.

^aReference group is the decreasing class.*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.

Table 4

Association Between Class Membership and Physical/Mental Health Indicators at the Fourth Year

	Increasing group (<i>n</i> = 47)	Steady group (<i>n</i> = 292)	Decreasing group (<i>n</i> = 381)
Indicators at the fourth year	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Self-rated health *	2.21 (.66)	2.65 (.65)	3.08 (.75)
ADL limitations *	3.17 (2.06)	1.16 (1.66)	.45 (1.27)
IADL limitations *	3.32 (1.43)	1.71 (1.75)	.68 (1.43)
MMSE **	16.53 (4.11)	17.64 (4.19)	18.33 (3.71)
Affect-tension *	13.85 (1.55)	13.01 (1.38)	12.59 (1.15)
GDS *	3.09 (1.74)	1.62 (1.61)	.95 (1.33)

Note. Results are generated using ANOVA tests without controls.

* Indicates significant differences between all three groups ($p < .05$).

** Indicates a significant difference between the increasing group and the decreasing group ($p < .05$); but no differences between these two groups with the steady group.