

Self-Perception of Aging Among Older Adults and Participation in Prevention

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Abstract

Many older adults do not engage in age-based prevention despite evidence to support reduced health risks and enhanced successful aging. The purpose of this study was to determine whether self-perceived aging (SPA) differed among older adults by age (young-old vs. old-old), participation in healthy lifestyle behaviors, screening, vaccinations, and self-rated health. Community-dwelling older adults (n=204) completed questionnaires reporting their SPA, self-rated health, and participation in recommended preventive healthy lifestyle behaviors, screening, and vaccinations. Our findings indicated that adults who were older and engaged in more preventive health behaviors, yet had lower self-rated health, tended to have better SPA. Prevention was greater in older adults who scored higher on aging well and aging successfully. Old-old (75 years or older) participants scored higher on aging successfully than those who were younger. Self-rated health was inversely related to SPA scores. Reporting poor or fair health did not diminish positive SPA in this sample.

Keywords

self-perceived aging, successful aging, preventive behaviors, healthy lifestyle behaviors, self-rated health

Clinical guidelines outlining recommendations for preventive screening, vaccinations, and healthy lifestyle behaviors are based upon research evidence demonstrating that adherence reduces poor health outcomes that commonly afflict older adults including stroke, cardiovascular events, diabetes mellitus, and cancer (United States Preventive Services Task Force [USPSTF], 2017). Prevention recommendations for screening, vaccinations, and healthy lifestyle behaviors provide specific timelines to guide implementation. Despite ample evidence- and age-based recommendations, many older adults do not participate in preventive screening for early detection, vaccinations, and healthy lifestyle behaviors to reduce risk (Nicholas & Hall, 2011). Further, much is known about the impact of healthy lifestyle behaviors such as physical activity, healthy diet, smoking cessation, and limited alcohol intake on reducing older adults' overall risk for disease and disability and for enhancing successful aging (Colpani et al., 2018; Hupin et al., 2015; Muezzinler et al., 2015).

Participation in Prevention Limited Among Older Adults

Only a relatively small percentage of older adults meet healthy lifestyle behavioral recommendations such as physical activity and healthy diet recommendations (Kim & Park, 2017; Ortolá et al., 2019). In addition, compared to younger adults, older adults are at higher risk for many types of

cancers though they are less likely to engage in screening tests designed to diagnose cancers early (Vedel et al., 2011). Older adults are also less likely than younger adults to adhere to recommended vaccinations, increasing their risk of morbidity and mortality associated with preventable communicable diseases (de Gomensoro et al., 2018).

Among older adults, there are differences in how age is experienced. Takatori and colleagues (2019) noted that older adults report a younger self-perceived age than their actual chronological age. This finding highlights the complexity of measures of aging and self-perception. Additional research is needed that addresses chronological age, self-rated measures of perceived aging and health, and participation in preventive activities targeting age-based risk factors as is the case for the guidelines from the USPSTF.

Self-rated health is related to health and health behaviors, although the relationship is not altogether clear. In late life, adults with more chronic disease and functional impairment are more likely to report poor self-rated health (Hays et al., 1996). Conversely, adults with better self-rated health are

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more likely to engage in a greater number of preventive health behaviors (Craig et al., 2018; Oftedal et al., 2019). Perhaps for this reason, self-rated health has been found to be predictive of mortality in older adults (Bamia et al., 2017; Schoenfeld et al., 1994). In addition, among middle-aged and older adults, self-rated health has been linked to life satisfaction and a perception of aging successfully (Whitley et al., 2016).

A growing body of literature demonstrates that self-perception of aging (SPA), or how a person perceives their aging process, is predictive of key measures of successful aging including mortality (Kotter-Grühn et al., 2009), physical health (Wurm et al., 2008), physical functioning (Levy et al., 2002), and self-rated health (Kim & Park, 2017). Over an 18-year period, older adults who scored higher on SPA at baseline had better functional health scores (Levy et al., 2002). In a longitudinal study, positive SPA was predictive of participation in sustained preventive health behaviors (healthy eating, exercise, and taking prescription medication accurately) over a 20-year period compared to more negative SPA (Levy & Myers, 2004). The published literature describing the relationship between SPA and participation in vaccination or screening tests that also impact health outcomes was not found. The present study addresses gaps in published research by including, in addition to healthy lifestyle behaviors, recommended screening tests and vaccinations, and by using a survey comprised of the current evidence-based clinical recommendations for preventive behavior and the recommended timeline for each (e.g. within 12 months or within the past 10 years; USPSTF, 2017). Based upon reviews of CINAHL and PubMed, these appear to be significant contributions to the research on older adult participation in prevention.

Purpose

The purpose of this study was to examine whether SPA (self-perception of aging well [SPAW] and of aging successfully [SPSA]) differs among older adults by age, participation in recommended healthy lifestyle behaviors, screening, vaccination, and self-rated health. This cross-sectional study was designed to determine if there were differences in SPA among community-dwelling older adults based on age group, participation in recommended preventive health behaviors (USPSTF, 2017), and general self-rated health. Our research questions were:

1. Is there a difference in SPA based on participation in recommended preventive health behaviors (screening, vaccinations, and healthy lifestyle activities)?
2. Is there a difference in SPA based on self-rated health?
3. Is there a difference in SPA between young-old (60–74 years) and old-old (75 years and older) adults?

Methods

Sample

This cross-sectional study utilized a convenience sample of older adults recruited from three primary care practices serving older adults and that included a nurse practitioner as one of the health care providers. The local Institutional Review Board approved this human subjects' research. Letters of invitation were sent to clients by the primary care practices and interested clients returned a postcard with contact information. A total of 1,161 letters of invitation were mailed out and 204 agreed to participate (response rate 18%). Surveys were mailed directly to participants and returned using provided postage-paid envelopes.

Measures

Using recommended guidelines from the USPSTF for healthy lifestyle activities, screening, and vaccinations, including frequency and duration (if appropriate), participants completed a survey reporting their prevention behaviors and health practices. Screening included vision, dental, and skin exams; colonoscopy; and, for women, PAP smear and mammogram, or, for men, prostate exam and PSA test. Vaccinations included influenza, tetanus, and pneumonia. Healthy lifestyle activities included alcohol intake per week, tobacco use (smoking or chewing), exercise per week (no regular exercise, less than three times per week for 20 minutes each, three or more times per week for 20 minutes each), seatbelt use, and frequency of eating breakfast. A composite score was calculated to provide a summative score for total preventive health behaviors. Within each category (screening, vaccinations, and lifestyle activities), one point was given for each behavior and the total number was calculated. Alcohol and tobacco were reverse scored so that one point was given for no behavior. This resulted in a total of six possible points for screening, a total of three possible points for vaccinations, and a total of five possible points for lifestyle activities. To provide an overall score for preventive health behaviors, the points in each of the three categories were summed, resulting in a possible range of scores from 0 to 14. Higher scores indicate engagement in more overall preventive health behaviors.

A validated and reliable general health question from the Centers for Disease Control and Prevention (CDC) population assessment (Andresen et al., 2001; CDC, 2000; Moriarty & Zack, 1999) was used to measure self-rated health. Participants answered the question, "Would you say that in general your health is" using a five-point scale with possible responses of ranging from "excellent" (ranked as 5) to "very good," "good," "fair," and "poor" (ranked as 1; CDC, 2000). Higher scores indicate better perceived health.

To measure SPA, participants answered two questions used in prior research with demonstrated reliability (Montross

et al., 2006; Strawbridge et al., 2002). The first question was, "I am aging well" (SPAW) with response options on a four-point Likert scale of "definitely false", "mostly false", "mostly true", "definitely true." The second question was, "On a scale of 1 (least successful) and 10 (most successful; SPSA), how well do you believe you are aging?" Respondents provided a whole number between 1 and 10 in answer to this item. For both measures, higher scores indicate better perceived aging.

Analyses

Data were analyzed using SPSS version 26 (IBM Corp., USA). Participant characteristics were analyzed using descriptive statistics and normality was assessed using the Shapiro-Wilk test. Significance was determined by $p < 0.05$, and descriptive data were reported as frequencies or means \pm standard deviation (SD). Data for the dependent variables (i.e. the two questions used to assess SPA designated as SPAW and SPSA) were non-normally distributed, so between-group differences were analyzed using a Mann-Whitney U test. Effect sizes were calculated as Cohen's d , with small, medium, and large effects defined using cut points of 0.2, 0.5, and 0.8, respectively (Cohen, 1988). To answer research questions 1 and 2, the sample was dichotomized based on the independent variables in order to create groups of equal or comparable sizes. For research question 1, participants were dichotomized based on total preventive health behavior scores (Low = 0–9 behaviors; High = 10–14 behaviors). To answer research question 2, participants were dichotomized based on self-rated health scores, with those reporting "poor" or "fair" health combined into a Low health group and those reporting "good," "very good," or "excellent" health combined into a High health group. Finally, to answer research question 3, participants were dichotomized into groups based on age, with young-old defined as those less than 75 years old and old-old defined as those 75 years of age and older.

Results

A total of 204 older adults (70.5 ± 7.7 years) completed the questionnaires. The majority of participants were female (63%), white (84%), and lived with a spouse or partner (64%). Just over half of the sample had either college or technical school level education (54%). Demographic data for the sample are presented in Table 1. Overall, participants perceived that they were aging well (mean score of 3.3 ± 0.7 on a four-point scale) and successfully (mean score 7.5 ± 2.1 on a ten-point scale). However, the mean score for general self-rated health was 2.5 ± 1.0 , indicating "fair" to "good" health only based on the numeric values of the five-point scale, and participants reported an average of only 9.1 ± 2.1 preventive health behaviors, representing adherence to less than 65% of recommended behaviors.

Table 1. Participant Characteristics (N = 204).

Characteristic	n (%)
Gender (female)	129 (63)
Race*	
• White/Non-Hispanic	175 (84)
• Black/African American	7 (3)
• Hispanic	13 (6)
• Asian	2 (1)
• Native American	8 (4)
Living arrangement*	
Live alone	54 (26)
With spouse/partner	133 (64)
With adult child	9 (4)
With friend	2 (1)
Other	7 (3)
Education	
High school only	53 (25)
College or technical school	110 (54)
Graduate school	41 (20)
Employment	
Retired	146 (70)
Work full-time	31 (15)
Work part-time	15 (7)
Other	12 (6)
Smoking Status (current non-smokers)	186 (89)
Exercise	
No regular exercise	71 (34)
1–2 times per week	30 (14)
3 or more times per week	103 (49)
Screening Tests	
Vision exam	141 (68)
Dental exam	140 (67)
Skin exam	62 (30)
Colonoscopy	124 (59)
PAP smear	37 (18)
Mammogram	78 (37)
Prostate exam	32 (15)
PSA test	56 (27)
Immunizations	
Tetanus	87 (42)
Pneumonia	129 (62)
Influenza	150 (72)

*Total N = 205; one participant described themselves using two categories.

Participation in Preventive Behaviors Overall

The number of preventive health behaviors reported by participants ranged from 2 to 13 (median = 9). Among all participants, 57% reported engaging in less than 10 behaviors and were categorized as Low Behaviors, while 43% reported engaging in 10 or more behaviors and were categorized as High Behaviors. Significant between-group differences were observed for both SPA measures (Table 2). Compared to the Low Behavior group, the High Behavior group reported greater mean scores for aging well (3.4 ± 0.7

Table 2. Comparison of Self-Perceptions of Aging (SPA) Based on Participation in Preventive Health Behaviors.

SPA Variable	Low Behaviors Mean \pm SD (n = 116)	High Behaviors Mean \pm SD (n = 88)	P-Value	Effect Size Cohen's d
Aging well (SPAW) total score	3.2 \pm 0.6	3.4 \pm 0.7	0.030	0.33
Successful aging (SPSA) total score	7.3 \pm 2.2	7.9 \pm 1.8	0.035	0.27

Predetermined level of significance $p < 0.05$.

Low Behaviors = 0–9 behaviors; High Behaviors = 10–14 behaviors.

Table 3. Comparison of Self-Perceptions of Aging (SPA) Based on Self-Rated Health.

SPA Variable	Low Health Mean \pm SD (n = 103)	High Health Mean \pm SD (n = 101)	P-Value	Effect Size Cohen's d
Aging well (SPAW) total score	3.5 \pm 0.6	3.1 \pm 0.7	< 0.001	0.67
Successful aging (SPSA) total score	8.3 \pm 1.7	6.8 \pm 2.2	< 0.001	0.68

Note: Predetermined level of significance $p < 0.05$.

Low Health = combined fair + poor health categories; High Health = combined good + very good + excellent health categories.

Table 4. Comparison of Self-Perceptions of Aging (SPA) Based on Age Group.

SPA Variable	Young-Old Mean \pm SD (n = 142)	Old-Old Mean \pm SD (n = 62)	P-Value	Effect Size Cohen's d
Aging well (SPAW) total score	3.2 \pm 0.7	3.3 \pm 0.6	0.618	0.14
Successful aging (SPSA) total score	7.3 \pm 2.2	8.1 \pm 1.6	0.043	0.36

Predetermined level of significance $p < 0.05$.

Young-Old = < 75 years; Old-Old = \geq 75 years.

vs. 3.2 \pm 0.6; $U = 4333.0$; $z = -2.175$; $p = 0.030$; $d = 0.33$) and aging successfully (7.9 \pm 1.8 vs. 7.3 \pm 2.2; $U = 4160.0$; $z = -2.111$; $p = 0.035$; $d = 0.27$).

Self-Rated Health and Level of Participation in Preventive Behaviors

General self-rated health scores ranged from 1 to 5 (median = 2). Overall, 50% of participants reported poor or fair health (scores 1–2) and so were grouped as Low Health, and 50% reported good, very good, or excellent health (scores 3–5) and were grouped as High Health. Again, there were significant differences in SPA between groups (Table 3). However, when compared to the Low Health group, the High Health group reported significantly lower mean scores for aging well (3.1 \pm 0.7 vs. 3.5 \pm 0.6; $U = 3451.5$; $z = -4.760$; $p < 0.001$; $d = 0.67$) and aging successfully (6.8 \pm 2.2 vs. 8.3 \pm 1.7; $U = 2624.5$; $z = -6.144$; $p < 0.001$; $d = 0.68$).

Young-Old and Old-Old Differences for Self-Perceived Aging

When grouped by age, 70% of participants were less than 75 years of age and so were included in the Young-Old group,

while 30% were 75 years and older and so were included in the Old-Old group. For aging well, there was no significant difference in mean scores between Young-Old and Old-Old adults (3.2 \pm 0.7 vs. 3.3 \pm 0.6; $U = 4259.5$; $z = -0.499$; $p = 0.618$; $d = 0.14$) (Table 4). By comparison, for successful aging (Table 4), the Old-Old group reported significantly greater mean scores than the Young-Old group (8.1 \pm 1.6 vs. 7.3 \pm 2.2; $U = 3552.0$; $z = -2.023$; $p = 0.043$; $d = 0.36$).

Discussion

The principle finding of this study was that adults who were older and engaged in more preventive health behaviors, yet had lower self-rated health, tended to have better SPA. Unfortunately, the majority of our sample (57%) engaged in less than 10 behaviors, which is consistent with research reporting that many older adults do not follow recommended prevention, vaccination, screening, and lifestyle behaviors (de Gomensoro et al., 2018; Kim & Park, 2017; Vedel et al., 2011). In our sample, engaging in fewer than 10 behaviors was associated with reporting lower mean scores for aging well and successful aging. Conversely, engaging in more than 10 behaviors (43% of the sample) was associated with higher mean scores for aging well and successful aging.

These results agree with prior research findings that older adults who were more engaged in health and lifestyle behaviors were also more likely to report aging successfully (Depp & Jeste, 2006; Pruchno & Wilson-Genderson, 2012; Sabia et al., 2012).

In contrast to our findings regarding preventive health behaviors, older adults in this sample with lower self-rated health were significantly more likely to report better mean SPA (aging well, aging successfully). Indeed, half of the sample reported poor or only fair health, but this did not appear to diminish positive SPA. This agrees with previous findings that community-dwelling adults viewed themselves as aging well despite chronic disease and disability (Montross et al., 2006). This apparent contradiction in perception may be due to the more complex nature of perceived aging compared to perceived health. Levy and colleagues (2002) found that self-rated health had less impact on functional health over time than SPA. Young and colleagues (2009) previously described limitations in the scientifically derived definitions of successful aging. They reported that older adults' views of successful aging have multiple dimensions that go beyond self-rated health (Young et al., 2009). Further, in a study of older adults' perception of aging, Duay and Bryan (2006) noted the impact of social engagement, finances, attitude, and coping on SPA, reflecting greater complexity than the more unidimensional measure of self-rated health. Cosco and colleagues (2014) also highlighted the heterogeneity of SPA, noting that it is an intrinsic state subject to "the plasticity of the human psyche" (p. 378). Future research should include mediational analyses of multiple psychosocial variables that may impact self-perception of aging well and aging successfully.

The previous literature has frequently reported younger age as an objective predictor of successful aging (Depp & Jeste, 2006). Further, advancing age is associated with physical and functional decline (Wilkinson et al., 2018). However, in our sample, the older age group reported significantly better perception of successful aging which supports literature highlighting the complexity of how older adults rate their aging processes. For example, newer models of successful aging consider numerous other factors including social and psychological variables that may compensate for this decline (Martin et al., 2015; Rowe & Kahn, 2015; Young et al., 2009). In this study, there was no difference in young-old vs. old-old on aging well scores, although the oldest-old were significantly more likely to report greater mean scores on successful aging. This is consistent with a recent large study of old-old Chinese adults that examined SPA and mortality (Zhang et al., 2020). Specifically, Zhang and colleagues (2020) found that a negative perception of aging was linked to decreased survival, and hence, it seems logical that the old-old participants in our study with prolonged survival would also have more positive perceptions of successful aging. Additionally, Zhang and colleagues (2020) reported an association between negative SPA and engagement in less

healthy lifestyles, which is also consistent with this study's findings regarding healthy behaviors. Engaging in healthier behaviors could, at least partially, mediate the association between age and SPA. Thus, even those who have negative SPA may benefit from interventions targeting behavior change to a healthier lifestyle.

Levy and colleagues (2002) noted that the discrepancy between those with positive SPA and negative SPA and respective scores on functional health grew wider over time (18 years) suggesting that the influence of SPA became greater with age. The findings of the present study suggest the need for more research to understand the impact of SPA over time on patterns of participation in prevention. Further, while measures of SPA and use of the terms "aging well" and "aging successfully" are designed to understand older adults' perceptions, it is not clear from the literature to date whether the terms are interpreted in the same way by researchers and older adults.

This study had both strengths and limitations that warrant discussion. The differences observed were not only statistically significant but also clinically significant. The minimum clinically important difference (MCID) is a surrogate measure of clinical significance, which has been defined as the smallest difference that patients perceive as beneficial (Jaeschke et al., 1989). The MCID for quality of life measures has been calculated to be a mean difference of 0.5 points in a single question (Jaeschke et al., 1989), such as the single questions regarding aging well and aging successfully used in the current study. In our sample, all of the differences in perception of aging successfully met this standard, which reflects a clinically significant influence of health behaviors, age, and self-rated health. By comparison, an alternate calculation of MCID is use of effect size (Draak et al., 2019; Norman et al., 2003). Using this criterion, the influence of health behaviors on SPA (aging well and successfully) was small but clinically relevant, while for self-rated health the influence was even greater based on medium effect sizes for both aging well and successfully. Finally, the effect size for the difference in aging successfully based on age was small but relevant, similar to what was observed for health behaviors. Although more research is needed, the clinical implications of the findings support development of interventions targeting health behaviors and self-rated health among even the oldest-old.

The present study was limited by a cross-sectional design and a convenience sample of older adults. The sample was predominantly white, female, and well-educated which limits the generalizability of our findings. The participants self-selected to participate, limiting generalizability, and there are inherent limitations in self-rated measures of behavior leading to over or under reporting by participants.

Using the USPSTF guidelines to frame survey questions provided evidentiary support for the selection of behaviors, screening tests, and vaccinations. The World Health Organization and other organizations reporting

evidence-based guidelines also may be useful for framing surveys based upon current recommendations for prevention. In this study, two measures of SPA used in prior research were chosen to add strength; however, the challenges of self-report measures of aging successfully remain. Prior studies have blended the use of the self-reported “I am aging successfully or aging well” (Strawbridge et al., 2002) as was done in this study and, as previously stated, the meaning ascribed to these words may differ between older adult respondent and researcher. In future research the multi-dimensional nature of the construct of SPA demands inclusion of additional psychosocial variables, clarification of the meaning of “aging successfully” or “aging well”, and attention to potential mediators.

This study expands what is known about SPA, self-rated health, and participation in preventive behaviors including healthy lifestyle behaviors, screening, and vaccinations. As other authors have noted, the findings of this study suggest that positive self-rated health may not be necessary for positive SPA. Based upon this study’s findings, future research should focus on elucidating the variables that mediate SPA and clarify the role of SPA and self-rated health in older adults’ decision-making to participate in prevention. Since older adults who engaged in healthy lifestyle activities, screening, and vaccinations were more likely to report higher mean SPA; interventions that facilitate increased adoption of these health behaviors are needed.

Declaration of Conflicting Interests

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