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The Association Between Lifestyle Activities and Late-Life Depressive Symptoms

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Abstract

The association between lifestyle activities and incident depressive symptoms was examined within the Women's Health and Aging Study II. Measures of activity and depressive symptoms were collected on four occasions, spanning six-years. Discrete-time Cox proportional hazards models were employed to examine the effects of baseline activity on depressive symptoms over time. Overall, activity was not associated with incident depressive symptoms. When specific activity domains were examined, greater participation in creative activities was associated with a reduced risk of depressive symptoms (hazard ratio = 0.92; CI 95% 0.87, 0.98). Further longitudinal research between diverse activities and incident depressive symptoms is warranted.

Keywords

older adults; aging; activities; engagement; creativity; depressive symptoms; survival analysis

As a growing number of individuals enter late life, it is projected that depression will be the second leading cause of poor health and mortality by 2020 (World Health Organization, 2012). Even in the absence of a clinical diagnosis of a depressive disorder, depressive symptoms are common among older adults, affecting approximately 4 to 23% of the

population, and contribute to cognitive impairments and functional disability in late adulthood (Meeks, Vahia, Lavretsky, Kulkarni, & Jeste, 2011). Therefore, from a public health perspective, it is critical to identify ways to reduce the onset of depressive symptoms in later life.

Maintaining an active lifestyle may be a key component in the preservation of psychological health well into adulthood. Prior studies have suggested that greater participation in a wide variety of activities, including physical, social, creative, and productive activity is associated with lower levels of depressive symptoms (e.g., Everard, Lack, Fisher, & Baum, 2000; Glass, Mendes de Leon, Bassuk, & Berkman, 2006; Iwasaki, Zuzanek, & Mannell, 2001; Li & Ferraro, 2005; Runco & Richards, 1997; Strawbridge, Deleger, Roberts, & Kaplan, 2002); however, findings have been mixed (Hong, Hasche, & Bowland, 2009; Kritz-Silverstein, Barrett-Connor, & Corbeau, 2001; McGue & Christensen, 2007). Although the exact mechanisms are unclear, engaging in such activities may provide a sense of mastery and control, influence self-esteem, reinforce social relationships, and increase feelings of happiness. As such, individuals with a stronger sense of control may believe that they have the skills, knowledge, and ability to impact their health and well-being through lifestyle choices (Lachman, Neupert, & Agrigoroaei, 2011), and as a result, may take better advantage of opportunities for engagement. Therefore, the social and psychological benefits gained through continued participation in a variety of activities may lessen depressive symptoms, and perhaps, prevent the onset of clinical depression (Fullagar, 2008).

Unfortunately, relatively few studies have explored the longitudinal associations between depressive symptoms and involvement in a wide range of lifestyle activities, and even fewer have specifically examined these relationships in older women. Given that depression is more prevalent in women (Meeks et al., 2011) and that women are more likely to report activity limitations at home and in leisure activities (U.S. Department of Health and Human Services, 2011), further research is warranted to establish the longitudinal relationships between activity participation and onset of depressive symptoms among older women. This is the goal of the current study.

Methods

This study uses data from the Women's Health and Aging Study II (WHAS II), a prospective study designed to examine physical and cognitive functioning among healthy, community-dwelling women. Detailed information on sampling procedures and study design are described elsewhere (Carlson et al., 1999). Briefly, this study was initiated to complement WHAS I, a study of the causes and changes in functional status in community-dwelling older women with moderate to severely impaired functioning at the time of enrollment (Fried, Kasper, Guralnik, & Simonsick, 1995). To participate in WHAS II, individuals could not display substantial cognitive impairment (indicated by a Mini-Mental State Examination (MMSE) score of 24 or greater; Folstein, Folstein, & McHugh, 1975) or report functional limitations on 15 tasks of daily living. Each eligible participant completed a battery of physical, cognitive, and psychosocial measures at baseline and received five follow-up exams at approximately 1.5-year intervals, with the exception of a three-year interval between the third and fourth exams. The data reported here were collected during Exams 2 through 5, spanning a six-year period.

Measures

Depressive symptoms were assessed via the 30-item Geriatric Depression Scale (GDS; Brink et al., 1982). Participants indicated whether or not they experienced each symptom over the prior week in a yes/no format. Responses were summed, with lower values indicating fewer depressive symptoms. Based on recommended cut-points (normal, 0–9; mild depressives,

10–19; and severe depressives, 20–30; Spreeen & Strauss, 1991), individuals were classified as having depressive symptoms if they exhibited 10 or more symptoms (Brink et al., 1982).

Activity was assessed via the Lifestyle Activities Questionnaire (LAQ; Carlson et al., 2012) at Exams 2 through 5. Participants reported their frequency of participation in 22 lifestyle activities (e.g., reading, shopping, watching television) during the past year on a 6-point scale (0 = never or less than once a month; 5 = every day). Responses were weighted according to a 30-day scale, ranging from “never or less than once a month” (0), “once a month” (1), “2 to 3 times a month” (2.5), “once a week” (4), “2 to 3 times a week” (10) to “every day” (30). Frequency was defined as the average of responses made on the 30-point scale.

We also classified lifestyle activities into four activity domains (intellectual, social, creative, and passive; see Appendix) based on an extensive review of activity classification systems used in existing literature (e.g., Hultsch, Hertzog, Small, & Dixon, 1999; Jopp & Hertzog, 2007). Although we recognize the classification of activity is complex, we have consistently used these activity domains in our previous research (Parisi et al., 2012). The frequency of participation was calculated within each activity domain to examine whether greater participation in specific types of activities was differentially associated with incident depressive symptoms, as defined above.

Data Analysis

A series of independent, discrete-time Cox proportional hazards models were employed to examine the effects of the overall level of baseline activity, as well as baseline participation in each of the four activity domains, on incident depressive symptoms over a six-year period. To estimate these models, individuals contributed information up to the onset of incident depressive symptoms (GDS score ≥ 10) (Brink et al., 1982; Spreeen & Strauss, 1991), the last exam for which data were available, or death. Final models were adjusted for demographics (age, race, and education), cognitive status (MMSE; Folstein et al., 1975), and number of chronic diseases at baseline. Results are presented as hazard ratios (HR) with 95% confidence intervals (CI). All p-values are based on Wald Chi-square test with 1 degree of freedom (df).

Results

Of the 436 women enrolled in the study, 338 completed the LAQ (Carlson et al., 2012) during Exam 2 (i.e., baseline). If LAQ scores were missing at baseline, available scores were imputed from Exam 3 ($n = 58$)¹. Forty-one participants were subsequently removed because of elevated depressive symptoms at baseline, defined as a GDS score ≥ 10 (Brink et al., 1982; Spreeen & Strauss, 1991); nine more women were excluded because they did not complete the GDS following the baseline visit. The individuals removed from analysis (due to GDS scores ≥ 10 at baseline) matched the larger sample in terms of age, race, and cognitive status; however, on average, those excluded reported fewer years of education (11.2 vs. 12.9 years) and more chronic health conditions (3.2 vs. 2.7).

The final analytical sample included 328 women. Of the 328 participants, 58 women (17.7%) exhibited incident depressive symptoms over the six-year period. At baseline, participants were, on average, 74 years of age ($SD = 2.8$), 16.5% were African-American, and had the equivalent of a high school education ($M=12.9$ years, $SD=3.3$). Additionally, the majority of participants were in relatively good mental (GDS, $M = 3.04$, $SD = 2.4$), physical

¹Imputation was conducted by carrying the last observation forward as correlational findings from our previous research suggested there was considerable stability of activity patterns over this interval (Carlson et al., 2012).

(number of chronic health conditions, $M = 2.7$, $SD = 1.4$), and cognitive (MMSE; $M = 28.9$, $SD = 1.9$) health. In terms of activity participation, individuals reported engaging in a wide variety of lifestyle activities at baseline. On average, individuals reported participating in some form of activity approximately 2–3 times a week. Participation rates varied across specific activity domains: Intellectual (2–3 times per week); Creative (2–3 times per week); Social (1 time per week); and Passive (4 times per week).

Overall, greater frequency of participation in lifestyle activities at baseline was not associated with a lower risk of incident depressive symptoms over time (Table 1). However, when examining participation in specific types of activities, greater frequency of participation in creative activities (i.e., Sewing, mending, fixing things; Preparing food; Singing or playing an instrument; Drawing or painting) was associated with a reduced risk of incident depressive symptoms (Table 1). In other words, each additional day per month of participation in creative activities was associated with a 7% decreased risk of developing depressive symptoms over the six-year period. After adjusting for age, education, race, cognitive status, and number of chronic diseases at baseline, more frequent participation of creative activities remained significantly associated with reduced risk of incident depressive symptoms. We did not find any evidence that frequently engaging in intellectual, social, or passive activity was related to onset of depressive symptoms over time.

Discussion

We found that more frequent engagement in creative activities was associated with a lower risk of depressive symptoms among older women over a six-year interval. Given the recent interest in the therapeutic benefits of creative activities (Leckey, 2011), there are several reasons why participation in such activities may influence mental health. For instance, creative activities may elicit positive emotions, promote self-efficacy and feelings of competence, or act as a coping mechanism to buffer against the negative effects of stress (Fullager, 2008; Leckey, 2011). Achieving a better understanding of how creative activity impacts these potential mechanisms is warranted, especially as those with a lowered sense of control and self-efficacy may be more vulnerable to impairments and experience health limitations earlier than those who perceive more competence and confidence in their abilities (Lachman et al., 2011). Further, eliciting positive emotion and increasing feelings of mastery may facilitate engagement in other forms of activity, which may help to maintain, or perhaps enhance, mental health and well-being in adulthood.

What remains unclear is the nature of the association between activities and depressive symptoms—such as whether it is a causal association, and whether lower engagement in creative activities is a cause or effect of depressive symptoms. Although more frequent participation in creative activities may reduce the risk of depressive symptoms, the reverse is equally plausible. Studies have shown that depressive symptoms predict declines in formal and informal leisure activities (Janke, Davey, & Klieber, 2006), suggesting that depressive symptoms may lessen an individual's capability or motivation for remaining active (Csikszentmihalyi, 1994). In turn, lowered activity levels can be indicative of further cognitive impairment and functional decline.

Contrary to our expectations, we did not find that engagement in social activities was associated with a significant reduction in risk of incident depressive symptoms. Other studies have also found no or modest associations between social activity and depressive symptoms (Hong et al., 2009; McGue & Christensen, 2007). Across the literature, the inconsistency in findings may be due to differences in definition and measurement of social engagement (e.g., social activity, social support, social networks), as well as the sample selected and analytic approach. In the current study, we were only able to assess frequency

of participation and not the specific nature or quality of these social interactions. Additionally, because we were examining activity in a relatively healthy, community-dwelling sample, there may not have been enough variability in patterns of social engagement to detect the anticipated effects. This issue warrants further investigation.

Although the present findings are important given the recent interest in activity and mental health, limitations need to be addressed. These findings are based on self-reported measures of depressive symptoms and lifestyle activity. Results may have differed if diagnoses of depression were made on the basis of a clinical interview, or if objective measures of activity were available. Also, given this was a sample of older women, our results may have differed if men were included. However, these findings are clinically relevant, especially as self-reported depressive symptoms can have a significant impact on health and the future onset of major depression (Meeks et al., 2011).

In practice, our findings can potentially be useful for activity professionals and practitioners interested in selecting and designing activity programs for older adults. Further, these findings also suggest the importance of using epidemiological data to provide insight into the efficacy of activity-based interventions. As such, our findings suggest that greater participation in creative endeavors may be especially promising for promoting mental health and well-being later in life. Many of these activities (e.g., drawing, writing, singing, playing an instrument) can easily be incorporated into existing activity programs for older adults and be practiced within a variety of settings. Additionally, creative activities tend to be less physically demanding than other forms of activity, and as a result, may be more likely to be sustained in the face of physical and cognitive declines often associated with aging. However, this is not to say that all individuals will benefit from engagement in creative activities. Our previous work has showed that achieving a better understanding of how activities are perceived (i.e., effortful, challenging, or enjoyable) can ultimately be useful in matching programs with individual preferences and abilities so as to maximize the benefits of such programs (Parisi, 2010).

The exact nature of activities which promote mental health remain relatively unexplored and poorly understood. Although our findings suggest that frequent engagement in creative activities may decrease the risk of incident depressive symptoms among older adults, more research needs to be conducted before drawing definitive conclusions. Replicating these findings with a greater number and wider variety of creative activities, within diverse populations, and with other cognitive and functional outcomes may be important avenues for further investigation. Perhaps the strongest evidence, randomized trials of activity interventions are needed to determine whether engagement in creative activities does indeed protect against the onset of depressive symptoms among older adults.

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Appendix

Activity domains

Domain

Intellectual

- Discussing local or national issues
- Reading a book
- Reading a newspaper
- Balancing checkbook
- Crossword puzzles
- Taking courses or classes

Social

- Attending church/religious service
- Visiting
- Caretaking
- Clubs/organizations
- Volunteering
- Playing cards or games
- Going to movies
- Going to plays/concerts

Creative

- Preparing food
- Sewing, mending, fixing things
- Singing, playing instrument
- Drawing or Painting

Passive

- Watching TV
 - Listening to music
 - Listening to radio (not music)
 - Looking at art
-

Table 1
Discrete-time Cox proportional hazards model on frequency of lifestyle activities

	Main Effect Model				Full Model ^a			
	HR	95% CI	Wald	p	HR	95% CI	Wald	p
Frequency, overall	1.01	0.91, 1.11	0.01	0.91	1.03	0.93, 1.14	0.29	0.59
Frequency, specific activities								
Intellectual	1.03	0.98, 1.08	1.07	0.30	1.04	0.99, 1.10	2.35	0.13
Social	1.00	0.91, 1.10	0.01	0.94	1.01	0.92, 1.12	0.11	0.74
Creative	0.92	0.87, 0.98	6.04	0.01	0.93	0.87, 0.99	4.73	0.03
Passive	1.02	0.97, 1.06	0.45	0.50	1.01	0.97, 1.06	0.38	0.54

Note.

^a Full model adjusts for age (years), education (years), race, cognitive status (MMSE), and number of chronic diseases at baseline. All p-values are based on Wald Chi-square test with 1 df.