Education as a Moderator of Help Seeking Behavior in Subjective Cognitive Decline

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Objective: Disparities in Alzheimer disease (AD) and differences in help seeking (HS) across sociodemographic groups warrant public health concern. Research addressing such disparities must shift toward the earliest clinical manifestations of AD to optimize diagnosis, intervention and care planning. Subjective cognitive decline (SCD), a risk state for AD, provides an important context in which to examine sociodemographic-related disparities in HS.

Participants and Methods: One hundred sixty-seven cognitively healthy older adults (M_{age} =73, $M_{education}$ =16) (26.4% Black, Asian, or "Other") completed SCD questionnaire, HS questions, and mood measures (depression and anxiety). Binary logistic adjusted regressions examined: (a) the association between SCD and HS; and (b) the extent to which education moderated the relationship between SCD and HS. SCD [b = 0.06, SE=0.13, *P*<0.001, odds ratio=1.06, 95% CI (1.03, 1.08)] and education [b=0.32, SE=0.09, *P*<0.001, odds ratio=1.37, 95% CI (1.15, 1.64)] were independently associated with HS, with significant interaction between education and SCD on HS [b=0.2, SE=0.01, *P*=0.01, odds ratio=1.02, 95% CI (1.00, 1.03)].

Conclusions: Findings elucidate the importance of tailoring SCDrelated psychoeducational resources depending on educational background as a preliminary stepping-stone in encouraging HS among older adults who may be at particular risk for developing dementia.

Key Words: Alzheimer's disease, subjective cognitive decline, help seeking behavior, disparities, sociodemographic, illness perception

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As of 2022, ~6.5 million Americans age 65 and older were living with Alzheimer disease (AD) and 12% to 18% of Americans aged 60 or older were living with its precursor, Mild Cognitive Impairment (MCI)¹. An important factor contributing to accurate diagnosis and treatment of these conditions is help seeking (HS) behavior.² HS requires individuals or families to actively recognize an area of difficulty, intentionally identify sources that can provide assistance for that particular difficulty, and willingly recruit help through communication with others.^{3,4} If undertaken early, HS has the potential to provide resources for families and ultimately lower burden of disease through engagement in clinical trials, access to medication, patient safety monitoring, and future planning.5 There are vast and far-reaching disparities in dementia-related HS (Alzheimer's disease Association, 2020). Differences in HS will become more critical over time as individuals from marginalized backgrounds and fewer years of formal education, risk factors for dementia, are expected to suffer additional burden once dementia prevalence doubles in 2060⁶). It is thus important to identify the factors that either challenge or facilitate HS at the earliest stages of cognitive decline.

Subjective Cognitive Decline (SCD), the self-perception of cognitive decline in the absence of clinical impairment on formal testing, may be the earliest clinical indication of AD.7,8 This construct has been previously found to be related to depression and anxiety, among other factors.9 Intuitively, it would be expected that individuals with higher levels of SCD would be more likely to seek out help and/or resources than those with lower or no SCD. However, HS is not a universal behavior in the context of SCD. For example, one community-based study found that despite 67% of individuals in the study reporting SCD (n = 126), and ranking it as more concerning than other comorbidities (i.e., hypertension, heart attack), only 1 individual reported HS.10 Similarly, past studies have indicated that only 18% to 26% of individuals aged 65 and over with SCD seek help^{11–13} in a primary care setting. These findings highlight the importance of understanding the factors that facilitate or hinder HS.5,12

The decision to seek help for memory difficulties is likely to be multifactorial. It may be influenced by knowledge of dementia,^{14,15} concern or fear of negative emotion and stress from a possible diagnosis,¹³ stigma and denial of symptoms.^{3,16} Divergent perceptions of normal aging, pathology, or causality of cognitive difficulties,^{13,17} uncertainty regarding the purpose of HS and early detection,¹⁸ differences in perception of¹⁹ and access to adequate care¹⁷ may also be contributory. A recent systematic review by Hill and colleagues indicated that additional factors influence HS including perception of problem severity, presence of social support, family history of dementia, and an individual's views of the healthcare system.

Among sociodemographic factors associated with HS, the effect of education on HS across medical and cognitive conditions has been explored.²⁰ Education holds particular

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importance as a modifiable target for intervention efforts to improve HS in older adulthood. In the context of SCD, higher education previously been found to either facilitate or delay HS. For example, higher levels of education have been related to increased compensatory strategies for cognitive difficulties involved with cognitive reserve, including increasing the efficiency and recruitment of alternative cognitive networks^{21,22} potentially leading individuals with cognitive symptoms to seek help later. In contrast, higher education has been found to increase health literacy¹⁰ and thus lead to earlier HS behavior.²³ Overall, the mixed and varied nature of previous studies suggests additional work on the relationship between SCD, HS, and sociodemographic factors such as education is warranted.

Given the scarce research in this area, the present study sought to examine the relationship between SCD and HS, and the extent to which education moderates this association. It was hypothesized that both SCD and education would be positively correlated with HS, and that there would be an interaction effect such that SCD would be more strongly associated with HS in individuals with higher levels of education. Findings may inform proactive efforts towards HS, disease management, and reduction of caregiver burden.

METHODS

Participants

Participants in the current study were drawn from a larger, ongoing longitudinal study at Columbia University Irving Medical Center (CUIMC) entitled "Task-specific and person-specific factors related to subjective cognitive decline" (R01 AG054525-01A1). Inclusion criteria required that participants were ages 56 through 90, English-speaking, cognitively normal (defined as z-scores $\geq -1.5SD$ on neuropsychological testing; detailed methodology is included in Chapman and colleagues). Exclusion criteria included severe ongoing psychiatric conditions, and current or past neurologic diagnoses, which could contribute to SCD (e.g., stroke, multiple sclerosis, etc.).

Procedures

Participants were recruited from both clinical (i.e., Department of Neurology) and research setting [i.e., Alzheimer's Disease Research Center (ADRC) and other ongoing studies of cognitive aging at the Taub Institute for Research on Alzheimer's Disease and the Aging Brain]. All participants provided informed consent and completed SCD interviews, mood assessments, HS questions, and cognitive testing. Counter-balanced across participants. Please see Chapman and colleagues for detailed on study procedures.

Measures

Demographic Information

The assessment began with a short interview focusing on demographic information (e.g., sex, formal education level) among others (e.g., categorical: self-identified race and ethnicity.)

HS Behavior

HS was measured dichotomously based on responses to the following 2 questions: (1) Have you gone to a doctor specifically for memory concerns? and (2) Have you mentioned memory concerns to a doctor? A 'yes' response to either question yielded a HS score of one; conversely, responses of 'no' to both questions yielded a HS score of zero (range = 0 to 1).

SCD

This age-anchored SCD questionnaire included 20 questions (10 focused on episodic memory and the 10 on other cognitive abilities, for example, multitasking and navigation). Participants were asked to rate their level of difficulty (0 to 6, with 0 indicating no difficulty and 6 indicating severe difficulty; range 0 to 120) on each item in comparison to others their age. The SCD score was represented as the sum of a participant's level of difficulty for each item.^{24,25}

Depressive Symptoms

Geriatric Depression Scale (GDS;²⁶) This 15-item questionnaire assessed self-reported depression over the past 2 weeks (range: 0 to 15). A modified total score was used in analyses and was derived from total geriatric depression score minus the item querying perceived memory concerns so as not to overlap with SCD measurement.

Anxiety Symptoms

Beck Anxiety Inventory (BAI;²⁷). This 20-item questionnaire measured anxiety and symptoms somatically related to anxiety (range: 0 to 20).

Data Analyses

Bivariate correlations and χ^2 tests of independence examined SCD and HS in relation to mood (e.g., depressive, anxiety symptoms) and demographic characteristics (e.g., age, sex) to identify potential covariates for regression models. Variables, which were associated with either HS or SCD, were included as covariates. The first logistic regression examined the relationship between SCD and HS behavior, whereas the second logistic regression was adjusted for covariates. The third logistic regression added an interaction term for SCD and education.

RESULTS

Sample Demographics

One hundred sixty-seven cognitively normal participants with variable levels of memory complaints were recruited. Of these, 53 (31.7%) were male and 114 (68.3%) were female, with a mean age of 73.27 (SD = 6.93), and mean education of 16.43 (SD = 2.34). Individuals self-identified as White (n = 123, 73.7%), Black (n = 36, 21.6%), Asian (n = 2, 1.2%) and Other (n = 6, 3.7%). One hundred fifty-six individuals reported being Non-Hispanic (93.4%) and 11 reported being Hispanic (6.6%). Please see Table 1 for demographic characteristics of overall sample.

Preliminary Bivariate Correlations and χ^2 Analyses

Bivariate correlations examined associations between HS, SCD and demographic and mood characteristics. Pearson correlation indicated age was not related to SCD (r=0.05, P=0.50) or HS (r<0.01, P=0.99). Similarly, χ^2 test of independence indicated sex was not related to SCD (r=0.03, P=0.69) or HS, χ^2 (1, 167) = 0.09, P=0.77. Regarding mood, depressive symptoms were related to SCD (r=0.25, P<0.001) and HS (r=0.16, P<05). Anxiety symptoms were related to SCD (r=0.38, P<0.001) and HS

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www.alzheimerjournal.com | 185

	Overall sample (N = 167) Mean (SD); range
Age	73.43(6.85); R = 51-92
Sex (% Female), N (%)	114 (68.3)
Education (# Y)	16.43 (SD = 2.34); R = 10-20
Race (%)	
White	73.7
Black	21.6
Asian	1.2
Other	3.6%
Ethnicity	
Non-Hispanic (%)	93.4
Anxiety (BAI)	5.03 (5.61)
Depression (GDS)	1.58 (2.02)

BAI indicates Beck Anxiety Inventory; GDS, Geriatric Depression Scale.

(r = 0.18, P = 0.03). Education level was positively related to SCD (r = 0.36, P < 0.001) and HS (r = 0.23, P < 0.01)

Unadjusted Association Between Subjective Cognitive Decline and HS Behavior

A binary logistic regression examined the relationship between SCD and HS (0 = non-help seeker, 1 = help seeker). The regression model was significantly different from the null model, $\chi^2(1) = 23.78$, P < 0.001, suggesting increased predictability compared with chance. The Hosmer-Lemeshow test of homogeneity was not significant and therefore did not indicate any potential issues with the model, $\chi^2(7) = 3.84$, P = 0.80. SCD was significantly and positively associated with HS, b = 0.05, SE = 0.01, P < 0.001, odds ratio = 1.05, 95% CI [1.03, 1.08]. The current model correctly classified 71.7% of participants, in comparison to 69.3 on the null model. Of note, sensitivity of the null model was 65% and specificity was 90%.

Adjusted Association Between SCD and HS

A second binary logistic regression examined the relationship between SCD and HS (0 = non-help seeker, 1 = help)seeker), controlling for level of education and anxiety symptoms. The regression model was significantly different from the null model, $\chi 2() = 37.81 \ P < 0.001$, suggesting increased predictability compared with chance. The Hosmer-Lemeshow test of homogeneity was not significant and therefore did not indicate any potential issues with the model $\chi^2(8) = 4.95$, P = 0.76. Specifically, SCD was significantly and positively associated with HS, b = 0.06, SE = 0.13, P < 0.001, odds ratio = 1.06, 95% CI [1.03, 1.08]. Level of education was also associated with HS, b = 0.32, SE = 0.09, P < 0.001, odds ratio = 1.37, 95% CI [1.15, 1.64]. The current model correctly classified 74.9% of participants (89.8% of participants who were not HS, and 43.5% of participants who were help seekers), an improvement from the null model (69.5%).

Education as a Moderator of SCD and HS

The final binary logistic regression model included an interaction term for SCD and education. This model was significantly different from the null model, $\chi 2(5) = 48.12$, P < 0.001 suggesting increased predictability compared with chance. SCD continued to independently predict HS [b = -0.24, SE = 0.11, P = 0.03, odds ratio = 0.79, 95% CI(0.63, 0.97)], although education no longer independently

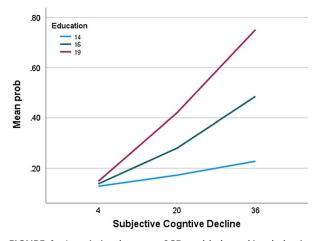


FIGURE 1. Association between SCD and help seeking behavior as a function of education. SCD indicates subjective cognitive decline. full color

predicted HS (P = 0.43). There was a significant interaction of level of education and SCD that predicted HS [b=0.2,SE = 0.01, P = 0.01, odds ratio = 1.02, 95% CI (1.00, 1.03)] (See Fig. 1) such that of those individuals with SCD, those with higher education were more likely to seek help.

DISCUSSION

The current study sought to extend previous research on HS behavior for memory concerns in older adults, as HS is a fundamental first step for planning, obtaining early care, and decreasing risky behaviors arising from cognitive decline in older adulthood. Specifically, this study focused on understanding the relationship between HS and SCD, as the latter has been posited to be an important risk state for MCI and AD,⁷ is easily measured, and involves self-reflective processes that are instrumental for HS. In the context of existing disparities in risk of dementia and HS, and differences in SCD expression among sociodemographic groups,^{3,17} the current study examined whether education moderates the extent to which SCD leads to HS. Taken together, findings from the current study indicated that higher levels of SCD, or greater cognitive concerns, and higher levels of education are both associated with HS. These associations are present above and beyond the known role that mood symptoms may have on SCD and HS.^{4,10,13,28-30} Moreover, education interacts with SCD such that in the context of higher SCD, those with higher education were more likely to address memory concerns with a healthcare professional.

It is possible that greater level of education sets an early foundation for greater knowledge regarding aging processes and health, or greater levels of education may create opportunities to learn about the importance of formal (medical/clinical) HS (e.g., engagement in biology or health management courses). Somewhat relatedly, higher level of education in childhood may also confer greater access to resources in adulthood, including social and financial capital through social connections and job attainment,31 consistent with the strong association between education and socioeconomic status. Thus, higher levels of formal education may lead individuals to initiate communications regarding their perceived cognitive difficulties with professionals. Education is a critical factor that may contribute to HS

186 | www.alzheimerjournal.com

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through increased or early recognition of symptoms, or increased health literacy among other factors.^{10,23,32–35} Together, these factors may enhance identification of needs or self-awareness of cognitive difficulties, and reasons to communicate one's own cognitive symptoms to family, friends, and professionals.

Other important factors to consider as contributors to HS, include seriousness of perceived consequences,^{10,36} biological attribution of symptoms,^{10,37,38} family history of dementia or memory problems, or trust in the healthcare system.³⁹ As SCD relies on self-reflective processes, intervention efforts (e.g., psychoeducation on normative vs. pathologic aging) could help reduce normalization of abnormal symptoms,³³ providing information on cognitive symptoms that are typical versus atypical for normative aging. As such, interventions may increase likelihood of identifying one's own difficulties and seeking medical attention.

The current study has several limitations. First, most individuals were part of the majority racial group (White) and had an average of 16 years of education. As such, racial and ethnic minoritized groups as well as low education groups are under-represented in this sample. Ongoing study enrollment seeks to address these limitations. Second, although education is one indicator of sociodemographic background, it is important to gather information on quality of education, perceived social status, individual and neighborhood-level SES, acculturation, and HS preferences (formal vs. informal) to better understand the factors, which may influence level and type of HS; ongoing research is extending to address these new foci. Importantly, a longitudinal approach to this work would enhance examination of SCD and HS, as cognitive status and HS may change over time with increasing age and so may the role of education and other changing sociodemographic factors (e.g., financial income). Future studies investigating SCD in traditionally underserved populations have the potential to detect the "undetected," in other words individuals who are not likely to seek medical services and whose medical conditions may be long under-detected. This work may serve to educate and inform the public on typical versus atypical aging before clinical impairment in found. Such early education will inform prevention efforts, which will be particularly impactful through utilization of interdisciplinary lens (public health, psychology, social work). Careful consideration of beliefs surrounding aging and pathology, and relation to HS across sociodemographic groups would also further enhance understanding of how and for whom educational intervention should be tailored to maximize early HS.

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