

## Subjective Cognitive Decline and Associated Health Problems among Rhode Island Adults

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Cognitive functioning is generally defined as the ability to think, reason, and remember; and includes components such as memory, attention, executive functioning, and ability to carry out remembered skills (e.g., driving).<sup>1</sup> Declines in cognitive functioning can have significant implications on health, and increasing problems with memory are often the first signs of emerging, more serious cognitive health issues, such as dementia and Alzheimer's disease. Because of this, as part of the *Healthy Brain Initiative*,<sup>1</sup> the Centers for Disease Control and Prevention and the Alzheimer's Association identified cognitive decline as a significant public health problem and made the recommendation to develop population-based surveillance of cognitive impairment.<sup>2</sup> As a result, a Cognitive Decline module was added to the Behavioral Risk Factor Surveillance System (BRFSS), a national survey of adult behavior and health. This article is the first to examine the burden of self-reported cognitive decline in Rhode Island and evaluates the relationship between subjective cognitive decline and demographic factors, chronic disease and mental health.

### METHODS

Data were from the 2015 Rhode Island BRFSS. The BRFSS is a telephone survey of non-institutionalized adults 18 years of age and older and is used to measure risk behaviors and health. Data obtained from the survey sample are weighted to obtain state population estimates.

Subjective cognitive decline (SCD) was assessed among respondents ages 45 and older with the question "During the past 12 months, have you experienced confusion or memory loss that is happening more often or is getting worse?" Those who answered "yes" were defined as having SCD and were asked six follow-up questions to measure the degree to which SCD has interfered with their lives.

Chronic disease conditions assessed included history of diabetes (excluding gestational), cardiovascular disease (myocardial infarction, stroke, or angina/coronary heart disease), high blood pressure (excluding pregnancy-related), arthritis, chronic obstructive pulmonary disease (COPD), and current obesity (Body Mass Index  $\geq 30$ ). Mental health variables measured included history of depression, frequent mental distress (FMD;  $\geq 14$  days in the last 30 days where mental health was not good), adequacy of social and emotional support (always, usually, rarely, or never get support

needed), and overall satisfaction with life (very satisfied, satisfied, dissatisfied, very dissatisfied). Demographic characteristics assessed included respondent sex, age, race/ethnicity, education level, employment status, relationship status, income, and veteran status.

Univariate analyses and multivariable logistic regression were conducted to measure the prevalence of SCD and its association with demographic variables. Univariate analyses were conducted to examine the relationship between SCD and chronic disease and mental health. All analyses were conducted in SAS 9.4 (SAS Institute, Inc., Cary, North Carolina) to account for the complex sampling design.

### RESULTS

There were 4,129 Rhode Island adults ages 45 years and older who gave a valid ("yes" or "no") response to the SCD measure "During the last 12 months, have you experienced confusion or memory loss that is happening more often or is getting worse". Of this sample, 11.5% [95% Confidence Interval [95% CI]: 10.0–12.9] reported they had experienced SCD in the preceding 12 months. When weighted to the state population this is equivalent to approximately 45,755 adults.

Univariate analyses found that prevalence of SCD differed significantly based on age, sex, education, income, race/ethnicity, relationship status, and employment status. (Table 1). After controlling for demographic variables significantly associated with SCD, male sex, income less than \$25,000, age 45–54 years, age 55–64 years, unemployment, and being retired/homemaker remained associated with significantly increased odds of SCD (Table 2).

Among those with SCD, 54.7% reported that memory problems have at least sometimes forced them to give up day-to-day activities (e.g., cooking, driving) and/or interfered with work, volunteer or social activities. About half (51.6%) reported they or someone else discussed these memory problems with a healthcare professional (Table 3).

SCD was significantly associated with increased prevalence of cardiovascular disease, COPD, diabetes, arthritis, high blood pressure, and obesity (Figure 1). Analysis of mental health indicators revealed those with SCD were significantly more likely to have depression, be dissatisfied with life, experience FMD, and feel they do not get adequate social/emotional support (Figure 2).

**Table 1.** Self-reported subjective cognitive decline (SCD) among RI adults aged ≥ 45 years by selected characteristics (N=4,129)

	SCD (N=445; 11.5%)			No SCD (N=3684; 88.5%)		
	n	Weighted %	95% CI	n	Weighted %	95% CI
<b>SEX*</b>						
Male	191	13.5	(10.9-16.0)	1,446	86.5	(84.0-89.1)
Female	254	9.8	(8.2-11.4)	2,238	90.2	(88.6-91.8)
<b>RACE/ETHNICITY***</b>						
White	367	9.9	(8.5-11.2)	3,284	90.1	(88.8-91.5)
Nonwhite	70	21.2	(14.9-27.4)	343	78.8	(72.6-85.1)
<b>AGE*</b>						
45-54 years	106	14.4	(10.9-17.9)	790	85.6	(82.1-89.1)
55-64 years	149	11.2	(8.8-13.6)	1,122	88.8	(86.4-91.2)
65 years and older	190	9.2	(7.7-10.8)	1,772	90.8	(89.2-92.3)
<b>RELATIONSHIP STATUS*</b>						
Partnered	184	9.9	(8.1-11.7)	2,010	90.1	(88.3-91.9)
Not partnered	258	13.6	(11.2-16.0)	1,659	86.4	(84.0-88.8)
<b>EMPLOYMENT STATUS***</b>						
Employed	98	6.2	(4.5-7.9)	1,636	93.8	(92.1-95.5)
Homemaker/ Retired/Student	188	10.1	(8.4-11.7)	1,631	89.9	(88.3-91.6)
Unemployed/ Unable to work	156	30.1	(24.2-36.0)	392	69.9	(64.0-75.8)
<b>INCOME***</b>						
\$0-\$24,999	168	23.2	(18.5-28.0)	626	76.8	(72.0-81.5)
\$25,000-\$49,999	71	10.7	(7.3-14.2)	692	89.3	(85.8-92.7)
\$50,000 or more	122	7.0	(5.5-8.5)	1,612	93.0	(91.5-94.5)
<b>EDUCATION**</b>						
High school or less	183	13.7	(11.0-16.4)	1,224	86.3	(83.6-88.4)
Some college	127	12.8	(9.8-15.7)	864	87.2	(84.3-90.2)
College graduate	134	7.4	(6.0-8.9)	1,588	92.6	(91.1-94.0)
<b>VETERAN</b>						
Yes	83	12.3	(9.2-15.3)	595	87.7	(84.7-90.8)
No	362	11.3	(9.7-13.0)	3,086	88.7	(87.0-90.3)

Source: BRFSS, 2015

\* Nonwhites included Hispanic, African American, Asian, Native American/Alaska Native, Pacific Islander, and Other race. Numbers were too small to report by individual race/ethnic group.

\*p&lt;.01; \*\*p&lt;.001; p&lt;.0001

**Table 2.** Multivariable logistic regression of characteristics associated with subjective cognitive decline (SCD) among RI adults ≥45 years (N=3,242)

	Adjusted Odds ratio (AOR)	95% CI
<b>SEX</b>		
Male	1.42	(1.02-1.97)
Female	Ref.	--
<b>RACE/ETHNICITY</b>		
White	Ref.	--
Nonwhite <sup>a</sup>	1.44	(0.89-2.33)
<b>AGE</b>		
45-54 years	1.93	(1.21-3.10)
55-64 years	1.55	(1.06-2.28)
65 years and older	Ref.	--
<b>RELATIONSHIP STATUS</b>		
Partnered	Ref.	--
Not partnered	0.62	(0.41-0.92)
<b>EMPLOYMENT STATUS</b>		
Employed	Ref.	--
Unemployed/ Unable to work	4.10	(2.42-6.95)
Homemaker/ Retired/Student	2.32	(1.51-3.55)
<b>INCOME</b>		
\$0-\$24,999	2.92	(1.71-4.98)
\$25,000-\$49,999	1.52	(0.91-2.53)
\$50,000 or more	Ref.	--
<b>EDUCATION</b>		
High school or less	0.95	(0.64-1.42)
Some college	1.12	(0.75-1.68)
College graduate	Ref.	--

Source: BRFSS, 2015

<sup>a</sup> Nonwhites included Hispanic, African American, Asian, Native American/Alaska Native, Pacific Islander, and Other race. Numbers were too small to report by individual race/ethnic group.

Ref.= reference group

## DISCUSSION

Analysis from the 2015 BRFSS shows the prevalence of SCD among adults 45 years and older in RI is approximately 11.5%; a rate similar to the national average of 11.6%.<sup>3</sup> More than half of RI adults with SCD reported that these problems have interfered with their day-to-day activities around the home or their social and work activities outside the home. Males, individuals aged 45–64 years, those with incomes less than \$25,000, and those who were unemployed

or retired were more likely to report SCD. Individuals with SCD were significantly more likely to be obese; have been diagnosed with diabetes, cardiovascular disease, arthritis, COPD, high blood pressure, and depression; have recently experienced FMD; be dissatisfied with life; and feel they do not get needed social/emotional support.

The finding that rates of SCD were highest among the youngest age group evaluated (45–54 years) was surprising. Cognitive decline is generally believed to become more

**Table 3.** Self-reported functional difficulties among RI adults ≥45 years reporting Subjective Cognitive Decline (SCD); (N=445)

	Percent	95% CI
Need assistance with day-to-day activities		
Always/Usually/Sometimes	39.9%	(33.0-46.9)
Rarely/Never	60.1%	(53.1-67.0)
Can get assistance when needed		
Always/Usually	47.4%	(35.3-59.6)
Sometimes/Rarely/Never	52.6%	(40.4-64.7)
Given up day-to-day activities		
Always/Usually/Sometimes	46.7%	(39.8-53.6)
Rarely/Never	53.3%	(46.4-60.2)
Interferes with work/volunteer/social activities		
Always/Usually/Sometimes	40.2%	(33.0-47.3)
Rarely/Never	59.8%	(52.7-67.0)
Any Functional Difficulties		
Yes <sup>a</sup>	54.7%	(48.0-61.3)
No	45.3%	(38.7-52.0)
Discussed confusion/memory loss with healthcare professional		
Yes	51.6%	(44.6-58.5)
No	48.4%	(41.5-55.4)

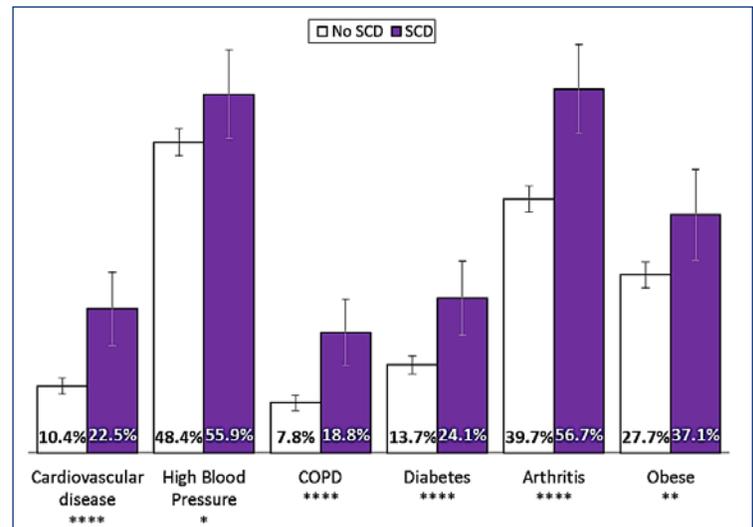
Source: 2015 BRFSS

<sup>a</sup> Functional difficulties: cognitive problems have always/usually/sometimes caused respondent to give up day-to-day activities, or interfered with ability to work/volunteer/engage in social activities

prevalent and worsen with age. It is possible that these findings are due to the self-reported nature of the data. Adults in the youngest age group may be more aware of and more likely to report memory changes. Additionally, this survey likely only captures less severe cognitive decline or decline in its early stages; those with more severe cognitive problems would likely be incapable of completing the survey. However, the finding that 14% of adults ages 45–55 are experiencing confusion or memory loss highlights the importance of understanding cognitive issues even among middle-aged adults.

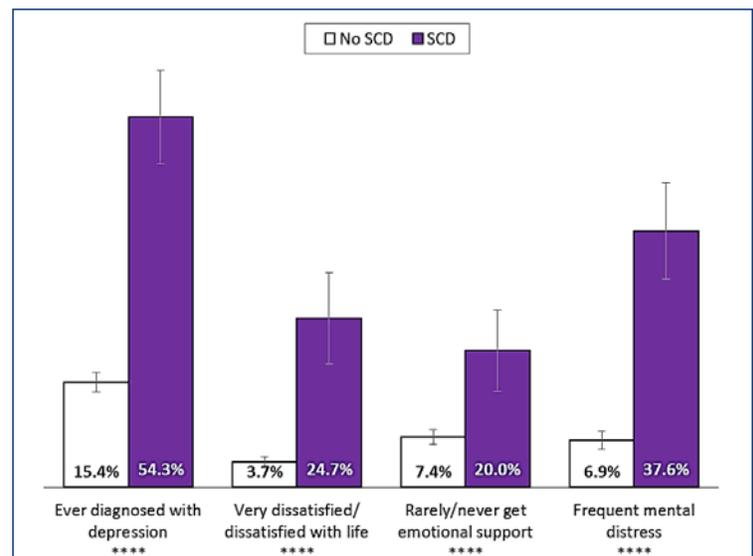
Overall, only about half of adults with SCD had spoken to a healthcare provider about their symptoms. The reasons individuals do not discuss cognitive issues with healthcare providers are unclear. Some possibilities are that onset of symptoms was relatively recent, patients are unsure if symptoms are worth discussing, or they forget to discuss the issue. It may be helpful for providers to ask patients about SCD as part of a standard evaluation, instead of relying on patients bringing the concerns to their attention.

We found a high rate of comorbidity between SCD and other health issues. Those with SCD were more likely to suffer from a number of chronic diseases and mental health problems. Due to the cross-sectional nature of the dataset, we cannot analyze causation or determine the reasons for the relationship between SCD and other health conditions.

**Figure 1.** Chronic health problems among RI adults ≥45 years with and without subjective cognitive decline (SCD)

Source: 2015 BRFSS

Note: bars display 95% Confidence Interval  
\*p<.05, \*\*p<.01, \*\*\*p<.001, \*\*\*\*p<.0001

**Figure 2.** Mental health problems among RI adults ≥45 years with and without subjective cognitive decline (SCD)

Source: 2015 BRFSS

Note: bars display 95% Confidence Interval  
\*p<.05, \*\*p<.01, \*\*\*p<.001, \*\*\*\*p<.0001

It is possible symptoms of disease or medications used to treat them can cause memory issues, that SCD led to other health problems, or just that the two issues share common risk factors (e.g. low income). More work is needed to better understand these relationships. Regardless of the exact nature of the association, it is important to consider how SCD may contribute to the worsening of chronic disease and mental health conditions. For example, individuals with diabetes who are experiencing confusion may forget to check

their blood sugar or take medications. The findings on the associations between SCD and mental health problems were striking, indicating that many of those with SCD are experiencing frequent distress and are much less satisfied with their day-to-day life.

This study had limitations. First, data were based on self-report which is prone to recall bias. As the name subjective cognitive decline indicates, all reports of cognitive decline were subjective to the respondent and not based on clinical assessment. Also, the study population included only adults in non-institutionalized settings and therefore, those in nursing homes or hospitals were excluded. This limits the generalizability of the findings and may result in an underestimate of the number of adults in the state experiencing cognitive problems.

Despite these limitations, these data provide a valuable tool by measuring the burden of subjective cognitive decline in RI. Public health professionals, aging service providers, the Division of Elderly Affairs, and other partners can consider this data when developing programs and policies to address the needs of adults living with SCD across the state. SCD is associated with a number of health issues and can have a severe impact on overall quality of life. Understanding and evaluating cognitive decline should continue to be a focus area in medicine and public health.

## References

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