

Prevalence of Subjective Cognitive Decline and its Associated Factors in Adults Aged 30 and Above in an Underprivileged Urban Area of Delhi, India

Research Article

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Abstract

Background and Objectives: Subjective cognitive decline (SCD) is an early warning sign of dementia and a significant contributor to disability among older adults. There is a lack of research on SCD among adults aged 30 years and above in urban underprivileged populations in North India. This study aimed to estimate the prevalence of SCD and examine its associations with socio-demographic and health-related factors.

Methods: A cross-sectional study was conducted among 350 adults aged ≥30 years residing in a North Indian urban underprivileged community. SCD was assessed using the SCD-Q21 scale. Socio-demographic and co-morbidity data were obtained via a structured questionnaire. Associations were examined through chi-square test and multiple logistic regression analyses.

Results: SCD was present in 83 participants (23.7%). Prevalence was higher among illiterate individuals compared to those with higher education (34.2% vs. 13.8%) and among participants with co-morbidities versus those without (42.3% vs. 12.8%). Marital status was significantly associated with SCD ($p < 0.001$). In adjusted analyses, being unmarried (or corresponding marital status) was independently associated with higher odds of SCD (Adjusted OR, 3.24; 95% CI, 1.52–5.79), as was the presence of co-morbid conditions (Adjusted OR, 3.08; 95% CI, 1.70–5.58).

Conclusions: Nearly one in four adults aged ≥30 years in this underprivileged urban setting report SCD. Given SCD's potential progression to dementia, early routine screening particularly for unmarried individuals and those with co-morbidities could enable preventive strategies to mitigate cognitive decline later in life.

Keywords: Subjective cognitive decline; dementia precursor; SCD Q21 scale

Introduction

Cognition encompasses a range of mental processes, including learning, memory, attention, and judgment, all of which are essential for an individual's daily functioning and overall quality of life. In recent years, growing attention has been directed toward individuals who report cognitive concerns—particularly memory-related issues—despite exhibiting normal performance on standardized neuropsychological assessments. This condition is known as Subjective Cognitive Decline (SCD). [1,2]

SCD is characterized by a self-perceived experience of worsening or more frequent episodes of memory loss or confusion in the absence of measurable cognitive impairment on clinical testing.[3] Although it is not a clinical diagnosis in itself, SCD is increasingly regarded as a potential early manifestation of neurodegenerative disorders such as Alzheimer's disease. [4]

In India, the estimated prevalence of dementia among adults aged ≥ 60 years is 7.4%, with approximately 3 million people affected by Alzheimer's disease. [5,6] These statistics highlight the urgency of early identification and management of cognitive decline to reduce the associated healthcare burden. As a possible precursor to dementia, SCD may play a crucial role in detecting neurodegeneration at an earlier, more manageable stage potentially delaying its onset through targeted interventions. [4,7]

Most studies on SCD have focused on individuals aged 60 years and above, a group already at significant risk for Alzheimer's disease and related dementias.[8] However, rehabilitative interventions at later stages often yield limited success.[9] There is a clear research gap regarding SCD in younger populations, particularly in India. Exploring SCD among adults aged 30 years and above, many of whom are still in their productive years, could offer critical insights into early prevention and promote healthy ageing across the life course.[10]

Given the paucity of literature on SCD in younger adults within low-resource settings, this study was undertaken to estimate the prevalence of SCD and its associated factors among adults aged ≥ 30 years residing in an underprivileged urban area of Delhi. This setting presents unique challenges and valuable opportunities for improving the understanding of cognitive health in socioeconomically disadvantaged populations.

Methodology

This was a community-based cross-sectional study conducted in an underprivileged urban area of Delhi, India. The study population consisted of adults aged ≥ 30 years residing in the area. A sampling frame comprising individuals aged ≥ 30 years was prepared, and participants were selected using simple random sampling.

Adults aged ≥ 30 years who were permanent residents of the study area were eligible for inclusion. Participants were excluded if they had a prior clinical diagnosis of cognitive impairment or mental illness, or they were unable to comprehend and respond to the questionnaire due to debilitating conditions or severe illness.

The sample size was calculated based on a reported SCD prevalence of 22.8% from a previous study by Narayanaswamy et al. [11] Using the formula: $4PQ/L^2$, where $P=22.8\%$, $Q=77.2\%$ ($100-P$), and $L=4.56$ (20% of P), the required sample size was calculated to be 338.65. This was rounded to 350 to account for a 5% non-response rate.

Data were collected using the **SCD-Q21 scale**, a validated questionnaire designed to assess SCD.[12] The tool was translated into Hindi and pilot-tested on 35 individuals (10% of the sample size) who were not included in the final analysis. The questionnaire also included sections on socio-demographic variables, selected lifestyle and health-related factors, and the presence of co-morbidities.

Trained field investigators conducted face-to-face interviews with participants at their residences. If a participant was unavailable during the initial visit, a second visit was made on the following day. Participants who could not be contacted after two visits were replaced through random selection from the remaining sampling frame until the desired sample size was achieved.

Data were entered and cleaned using Microsoft Excel and analyzed using IBM SPSS Statistics (v. 25). Categorical variables were summarized as frequencies and percentages, while continuous variables were presented as mean \pm standard deviation. The chi-square test was used for analyzing associations between categorical variables, and the student's t-test was applied to compare means of continuous variables. Multiple logistic regression analysis was performed to identify factors independently associated with SCD. Both crude and adjusted odds ratios (OR) with 95% confidence intervals (CI) were reported.

Ethical approval for the study was obtained from the Institutional Ethics Committee. Participants were fully informed about the study objectives and assured of their right to withdraw at any stage without consequences. Written informed consent was obtained from all participants. Confidentiality and anonymity were maintained throughout the study.

Results

A total of 350 participants were included in the study. The majority were in the age group of 31–40 years ($n = 146$, 41.71%), followed by 41–50 years ($n = 116$, 33.14%). Most participants were male ($n = 218$, 62.29%) and currently married ($n = 303$, 86.57%), while 30 participants (8.57%) were previously married. (Table 1)

In terms of socioeconomic status (based on the Revised Modified Kuppuswamy Scale, 2023), most participants belonged to the upper-lower class ($n = 238$, 68.00%) and lower-middle class ($n = 89$, 25.43%). Commonly reported co-morbid conditions included hypertension ($n = 66$, 18.86%) and diabetes ($n = 45$, 12.86%), while a majority reported no known health issues ($n = 220$, 62.86%). (Table 1)

With respect to lifestyle behaviors, 291 participants (83.14%) reported regular consumption of tea or coffee, 81 (23.14%) consumed alcohol, and 247 (70.57%) reported not using any tobacco products. (Table 1)

Table 1: Distribution of the study population according to socio-demographic, health related and lifestyle factors (N=350)

Variables	n/Mean	Percentage/SD
Gender		
Male	218	62.29
Female	131	37.43
Transgender	1	0.29
Age		
31-40	146	41.71
41-50	116	33.14
51-60	61	17.43
61-70	19	5.43
71 and more	8	2.29
Mean Age ± S.D. (years)	44.6	10.2
Marital		
Previously Married	30	8.57
Unmarried	17	4.86
Currently Married	303	86.57
Socioeconomic Status		
Upper class	0	0
Upper middle class	2	0.57
Lower middle class	89	25.43
Upper lower class	238	68.00
Lower class	21	6.00
Disease*		
Diabetes	45	12.86
Heart Disease	13	3.71
Thyroid disorder	28	8.00
Hypertension	66	18.86
None	220	62.86
Mean Sleep duration ± S.D. (hours)	7.12	1.02
Alcohol usage		
Yes	81	23.14
No	269	76.86
Tea/ Coffee consumption		
Yes	291	83.14
No	59	16.86
Tobacco intake		
Does not consume	247	70.57
Only smoke products	31	8.86
Only smokeless	0	0.00
Smoke+ smokeless	72	20.57

*Not mutually exclusive

SCD was observed in 83 participants (23.7%). Detailed item-wise responses from the SCD-Q21 scale are presented in (Table 2).

SCD was found to be significantly associated with age, marital status, education level, and presence of co-morbidities. The mean age of participants with SCD was significantly higher (51.46 ± 1.23 years) compared to those without SCD (42.70 ± 0.52 years) ($p < 0.001$). Marital status was significantly associated with SCD ($p < 0.001$), with the highest prevalence among previously married individuals (60.0%), followed by unmarried (23.5%) and currently married (20.1%) participants. Education level also showed a significant association ($p = 0.037$), with higher prevalence among illiterate participants (34.2%)

compared to those with higher education (13.8%). Participants with co-morbidities had a significantly higher prevalence of SCD (42.3%) than those without (12.8%) ($p < 0.001$).

After adjusting for potential confounders, marital status and co-morbidities remained significantly associated with SCD. Previously married individuals had significantly higher odds of SCD with crude OR = 3.65 (95% CI: 1.82–7.32, $p < 0.001$) and adjusted OR = 3.24 (95% CI: 1.52–5.79, $p < 0.001$).

Also, participants with co-morbidities also had higher odds of SCD with crude OR = 5.02 (95% CI: 2.96–8.52, $p < 0.001$) and adjusted OR = 3.08 (95% CI: 1.70–5.58, $p < 0.001$). Other factors—including age, education level, socioeconomic status, tobacco use, alcohol consumption, and caffeine intake—did not show statistically significant associations in the multiple logistic regression analysis. (Table 3)

Discussion

This community-based study was conducted among 350 adults aged ≥ 30 years residing in an underprivileged urban area of Delhi, India. The mean age of the participants was 44.6 years, with a majority being male (62.29%) and currently married (86.57%). While existing literature has primarily focused on SCD prevalence in individuals aged ≥ 60 years, with some extending the lower limit to 45 years, this study is, to the best of our knowledge, the first to assess SCD prevalence in adults aged ≥ 30 years in North India. [5,9,11,13]

We found the prevalence of SCD to be 23.7%, which is comparable to findings from other regions of India such as Bangalore (22.8%) and Karnataka (21.5%), and also to international studies conducted in Korea (17.4%–29.4%), China (18.8%), and in pooled global cohort data (25.6%).[11,14-16] A notably higher prevalence (45.2%) was reported in a study from Chennai, where participants were recruited from elderly care homes, hospitals, and health camps; the higher burden of co-morbidities in that population (e.g., $>50\%$ with diabetes or hypertension) may partly explain the increased SCD prevalence, compared to the present study, where 12.86% had diabetes and 18.86% had hypertension.[13]

Consistent with our findings, multiple studies have reported a significant association between SCD and various co-morbidities, including diabetes, ischaemic heart disease, thyroid disorders, anaemia, and gout.[17-19] A study from Italy also revealed that co-morbidities exert a mild but measurable effect on cognitive functioning.[20] In our study, participants with co-morbidities had over three times higher adjusted odds of experiencing SCD, reinforcing the need to consider co-morbidity as a key risk factor.

Marital status also emerged as a significant determinant of SCD. Participants who were previously married (divorced, separated, or widowed) had significantly higher odds of SCD, which aligns with findings by Roh et al.[17] In contrast, studies by Menon J et al and Lin et al did not find significant associations between marital status or co-morbidities and cognitive impairment.[13, 19] However, these discrepancies may be attributed to methodological differences particularly the lack of adjustment for confounders in the former and limited covariate adjustment in the latter.

Table 2: Association of various factors with Subjective Cognitive Decline (N=350)

Variables	SCD Present n (%) / mean ± sd	SCD Absent n (%) / mean ± sd	Total n (%) / mean ± sd	χ ²	p-Value
Overall SCD	83 (23.7)	267 (76.3)	350 (100)	-	-
Mean SCD score ± S.D.	13.77 ± 3.72	1.46 ± 1.48	4.38 ± 5.69	-	-
Gender					
Female	27 (20.5)	105 (79.5)	132	1.48	0.49
Male	56 (25.7)	162 (74.3)	218		
Total	83 (23.7)	267 (76.3)	350 (100)		
Mean Age ± S.D.#	51.46 ± 1.23	42.70 ± 0.52	44.6 ± 10.2	-7.541	<0.001*
Marriage status					
Unmarried	4 (23.5%)	13 (76.5)	17	23.98	<0.001*
Currently Married	61 (20.1)	242 (79.9)	303		
Previously Married (Widow, Widower, Divorced)	18 (60%)	12 (40)	30		
Socioeconomic status~					
Lower middle Class and above	20 (21.9)	71 (78.1)	91	0.206	0.63
Upper lower and below Class	63 (24.4)	196 (75.6)	259		
Education status					
Illiterate	28 (34.2)	54 (65.8)	82	13.391	0.037*
Primary	14 (31.9)	30 (68.1)	44		
Middle	11 (27.5)	29 (72.5)	40		
Secondary	16 (19.3)	67 (80.7)	83		
Intermediate and Above	14 (13.8)	87 (86.2)	101		
Tobacco consumption					
Present	28 (27.2)	75 (72.8)	103	0.971	0.324
Absent	55 (22.3)	192 (77.7)	247		
Mean Sleep duration ± S.D.#	6.98 ± 0.11	7.16 ± 0.062	7.12 ± 1.02	1.408	0.1600
Tea/ Coffee consumption					
Present	71 (24.4)	220 (75.6)	291	0.446	0.504
Absent	12 (20.4)	47 (79.6)	59		
Alcohol consumption					
Present	21 (25.93)	60 (74.07)	81	0.285	0.593
Absent	62 (23.1)	207 (76.9)	269		
Comorbidities					
Present	55 (42.3)	75 (57.7)	130	0.446	<0.001*
Absent	28 (12.8)	192 (87.2)	220		

* Statistically Significant

Analysis done by independent t test

~ Modified Kuppuswamy Socio-Economic Scale (2023)

Table 3: Multiple Logistic Regression Analysis of Factors Associated with SCD (N=350)

Variables	Crude Odds Ratio	95% CI	p value	Adjusted Odds Ratio	95% CI	p value
Age	0.97	0.89-1.05	0.213	0.95	0.87-1.03	0.192
Gender						
Male	1.29	0.77-2.16	0.326	1.08	0.59-1.9	0.8
Female						Reference
Marital status						
Previously Married and unmarried	3.65	1.82-7.32	<0.001*	3.24	1.52-5.79	<0.001*
Married						Reference
Education						
Intermediate and above	0.75	0.64-0.88	<0.001*	0.85	0.71-1.02	0.08
Secondary and below						Reference
Socioeconomic status						
Lower middle and above	1.12	0.73-1.7	0.59	0.79	0.49-1.27	0.349
Upper middle and below						Reference
Comorbidities						

Present	5.02	2.96-8.52	<0.001*	3.08	1.7-5.58	<0.001*
Absent	Reference					
Sleep Duration	0.84	0.66-1.07	0.160	0.81	0.62-1.07	0.148
Smoking						
Present	1.3	0.76-2.2	0.325	1.00	0.52-1.92	0.994
Absent	Reference					
Alcohol						
Present	1.16	0.65-2.07	0.53	1.74	0.87-3.49	0.115
Absent	Reference					
Coffee and tea						
Present	1.26	0.63-2.51	0.5	0.75	0.33-1.68	0.490
Absent	Reference					

Supplementary Table: Mean score of Subjective Cognitive Decline Questionnaire Items (N=350)

S. No	Question	Mean	Standard Deviation
1	Do you think you have problem with your memory?	0.214	0.411
2	Do you have difficulty remembering a conversation from a few days ago?	0.191	0.394
3	Do you have complaints about your memory in the last 2 years? (yes/no)	0.203	0.403
4	How often is the following a problem for you: Personal dates (e.g., birthdays)?	0.291	0.292
5	How often is the following a problem for you: Phone numbers you use frequently?	0.266	0.307
6	On a whole, do you think that you have problems remembering things you want to do or say?	0.169	0.375
7	How often is the following a problem for you: Going to the store and forgetting what you wanted to buy?	0.199	0.286
8	Do you think that your memory is worse than 5 years ago?	0.243	0.429
9	Do you feel you are forgetting where things were placed?	0.251	0.434
10	How often is the following a problem for you: Knowing whether you've already told someone something?	0.206	0.279
11	Overall, do you feel you can remember things as well as you used to?	0.397	0.490
12	Has your memory changed significantly?	0.200	0.401
13	Do you feel that you have more memory problems than most?	0.174	0.380
14	Do memory problems make it harder to complete tasks that used to be easy?	0.171	0.377
15	Do you have more trouble remembering things that have happened recently? (yes/no)	0.163	0.370
16	Do you notice yourself repeating the same question or story?	0.149	0.356
17	Do you lose objects more often than you did previously?	0.174	0.380
18	Do you feel you are unable to recall the names of good friends?	0.143	0.350
19	On a whole, do you think that your memory is good or poor?	0.209	0.407
20	How often is the following a problem for you: Things people tell you	0.230	0.282
21	How often is the following a problem for you: Words	0.141	0.250

Like previous studies, in the present study, people with higher education had lower odds of having SCD, although this association no longer remained significant after adjusting for confounders. [13,16,19] This indicates that different levels of educational attainment may cause differences in SCD prevalence.

Although a higher proportion of males than females had SCD in our study, gender, age, and socioeconomic status were not statistically significant factors; this is supported by other studies in both Indian and international settings. [13-16,18] Lifestyle factors such as alcohol consumption, tobacco use, tea/coffee intake, and sleep duration were also not associated with SCD, which is consistent with prior studies. [19,21] However, Roh et al reported an association between alcohol use, female gender, and increased odds of SCD in a Korean cohort indicating possible cultural or demographic variations in risk factors. [17]

Regarding education, individuals with higher educational attainment exhibited a lower prevalence of SCD in bivariate analysis,

although the association lost statistical significance in multiple logistic regression analysis. Similar trend has been observed in other studies as well, supports the cognitive reserve hypothesis, wherein education may offer a protective buffer against early cognitive decline. [13,16,19]

Conclusion

This study highlights a significant prevalence of SCD amongst adults aged ≥ 30 years in an underprivileged urban area of Delhi. Co-morbidities, especially diabetes and hypertension, were strongly associated with SCD. Marital status, particularly being previously married, was another key determinant. The rapid rise of noncommunicable diseases and marital separation may further exacerbate the risk of SCD. As SCD is an early indicator of dementia, implementing early screening and targeted interventions focusing on co-morbid conditions and social factors in socioeconomically disadvantaged areas could delay or prevent the onset of dementia, promoting healthier ageing outcomes. Addressing these risk factors is crucial for improving public health in vulnerable populations.

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