

## Quality of Life in People With Subjective Cognitive Decline

### ABSTRACT

**Objective:** Quality of life is extensively studied in older persons, but there are few studies that investigate it in people with subjective cognitive decline. Our aim was to evaluate the quality of life in a Romanian sample of individuals with subjective cognitive decline compared to controls while accounting for different possible moderators. To our knowledge, this is the first study to evaluate the quality of life in a Romanian subjective cognitive decline sample.

**Methods:** We conducted an observational study to evaluate differences in the quality of life between subjective cognitive decline and controls. Participants were evaluated for subjective cognitive decline according to Jessen et al. We collected sociodemographic and clinical characteristics and information about physical activity. Quality of life was evaluated using the Short Form-36 questionnaire.

**Results:** There were 101 participants included in the analysis with 66.33% (n=67) in the subjective cognitive decline group. There were no differences between the social, demographic, and clinical characteristics of the individuals. The subjective cognitive decline group had a higher score on the negative emotion trait of Big Five. Individuals with subjective cognitive decline reported poorer physical functioning ( $P = .034$ ), more role limitations due to physical health ( $P = .010$ ) and emotional problems ( $P = .019$ ), and less energy ( $P = .018$ ) compared to the control group.

**Conclusion:** Persons with subjective cognitive decline reported diminished quality of life compared to controls and differences were not explained by other sociodemographic and clinical characteristics evaluated. This area could prove to be an important target for non-pharmacological interventions in the subjective cognitive decline group.

**Keywords:** Quality of life, subjective cognitive decline, impairment

### Introduction

Subjective cognitive decline (SCD) refers to self-perceived cognitive difficulties compared to a previously normal status in individuals who do not otherwise meet the pathological threshold in relevant psychometric tests.<sup>1</sup> The nosological concept of SCD was advanced in an effort to provide a standardized framework within which to categorize the subtle changes that often precede the more visible manifestations of neurodegeneration. Subsequent data backed its validity as a predictor of future mild cognitive impairment and dementia, with the largest meta-analysis to date finding that SCD is associated with an approximately 2-fold risk of further deterioration.<sup>2</sup> However, SCD should not be understood strictly as a prodromal state of dementia, as it can also occur together with other psychiatric conditions, such as depression or anxiety, as well as in the context of somatic illnesses<sup>3</sup> and not all cases lead to further cognitive decline. Regardless of the underlying cause, epidemiological estimates place its prevalence at about one-quarter of persons over 60,<sup>4</sup> and as the median age continues to rise, the burden it places on public health will significantly increase. On an individual level, the effect of SCD on the quality of life (QoL) of older persons is extensively well-documented.<sup>5</sup> As there are several instruments for measuring QoL, generalizing the effect of cognitive decline on QoL is difficult. In studies with a similar design to ours, the control group had



Alexandru Pavel<sup>1,2</sup> 

Radu Paun<sup>1,2</sup> 

Valentin Matei<sup>1,2</sup> 

Alina Rosca<sup>1,2</sup> 

Catalina Tudose<sup>1,2</sup> 

<sup>1</sup>Department of Psychiatry, University of Medicine and Pharmacy "Carol Davila," Bucharest, Romania

<sup>2</sup>"Alexandru Obregia" Psychiatric Hospital, Bucharest, Romania

**Corresponding author:**  
Valentin Matei  
✉ valipmatei@yahoo.com

**Received:** July 20, 2022  
**Accepted:** December 27, 2022  
**Publication Date:** March 29, 2023

**Cite this article as:** Pavel A, Paun R, Matei V, Rosca A, Tudose C. Quality of life in people with subjective cognitive decline. *Alpha Psychiatry*. 2023;24(2):60-64.



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an overall better QoL as measured by Short Form-36 (SF-36)<sup>6</sup> compared to SCD and MCI individuals. These significant differences were noticed in the role-physical, vitality, and role-emotional components of SF-36.

The broad concept of QoL defines an individual's satisfaction with their position in life in the context of his/her environment and in relation to their goals, expectations, standards, and concerns.<sup>7</sup> It has been established that individuals with SCD consistently report lower QoL across multiple functional domains,<sup>5</sup> as sufferers exhibit higher levels of subclinical negative affective symptoms, impairments in metacognition,<sup>8</sup> worse sleep quality,<sup>9</sup> and lower levels of social and emotional support.<sup>10</sup> However, most studies on this topic include SCD individuals with psychiatric and/or somatic comorbidities, which make assessing the independent impact of SCD difficult, as they all negatively influence QoL to some extent.

The aim of our study was to analyze the relationship between SCD and QoL in a cohort of Romanian older adults matched for social, demographic, and clinical parameters to a non-SCD control group. In controlling these potential confounders, we hoped to better demonstrate the direct effect of SCD on QoL.

## Methods

### Participants

This study had a cross-sectional design. People were selected from primary care units when presenting for regular checkups between March 2020 and December 2020. Our research was conducted in accordance with the Declaration of Helsinki,<sup>11</sup> obtained ethical approval from the Institutional Review Board of the Romanian Alzheimer Society (IRB No. 11/06.03.2020) and all participants signed informed consent. All assessments were performed by a group of psychiatrists.

The inclusion criteria were: (a) age between 50 and 80 years, (b) Mini-Mental State Examination (MMSE)<sup>12</sup> score over 24, (c) Hamilton Depression Rating Scale<sup>13</sup> total score below 12, (d) Hamilton Anxiety Rating Scale<sup>14</sup> total score below 17, and (e) no substance use disorder in the previous 6 months other than caffeine or tobacco. Exclusion criteria were: (a) diagnosis of major or mild neurocognitive disorder according to DSM 5,<sup>15</sup> (b) presence of cerebrovascular disease translated as Hachinski score over 4, (c) current diagnosis of intellectual disability, major depressive disorder, bipolar disorder, and anxiety disorder according to DSM 5, (d) severe somatic disorders such as epilepsy, organ failure, or other diseases that could impair collection of data from the patient such as severe hearing/seeing impairment and motor deficit.

### Assessment Tools

We collected social and demographic characteristics of the individuals and performed a full interview to screen for any psychiatric and

somatic disorders. Their GP files were also studied for any psychiatric or somatic disorders. We added reliability coefficients for both original scales, translated versions (if available), and for the present study in the form of Cronbach's  $\alpha$ . There are different reports in the literature regarding the acceptable value of the coefficient with variances between 0.70 and 0.90.<sup>16</sup>

Subjective cognitive decline was evaluated according to Jessen et al<sup>17</sup> using the question: "Do you feel that you are having difficulties with your memory?" and the possible answers were: "Yes and it bothers me," "Yes but it does not bother me," and "No." Persons who answered "Yes" were categorized as having SCD, and persons who answered "No" were included in the control group.

In order to evaluate objective cognition and exclude cognitive decline, we used MMSE<sup>12</sup> (Cronbach's  $\alpha=0.91$ <sup>18</sup>). This is a short test to evaluate different cognitive functions such as attention, memory, calculation, executive functioning, and visuospatial ability. The reliability coefficient for the Romanian versions was between 0.54 and 0.57 (medium reliability) if considering the cognitively unimpaired population.<sup>19</sup> The reliability coefficient for our study was  $\alpha=0.79$ .

The International Physical Activity Questionnaire (IPAQ—Cronbach's  $\alpha=0.65$  in the original version, 0.52 in our study—medium reliability, and 0.80 in the translated version<sup>20</sup>), is developed for evaluating health-related physical activity performed in the last week. There are 4 domains evaluated: leisure time physical activity, domestic and gardening (yard) activities, work-related physical activity, and transport-related physical activity. At the end, there is an item that evaluates minutes of inactivity. Scores for each domain are calculated in multiples of resting metabolic rates (METs) performed for minutes (MET-minutes). A total score is computed by adding the scores of each domain and was presented in MET-minutes.

The Big Five Short Version is a questionnaire that evaluates personality across five domains: Extraversion (Cronbach's  $\alpha=0.68$  in our study, 0.70 in the original scale,<sup>21</sup> and 0.91 in the translated version<sup>22</sup>), Agreeableness (Cronbach's  $\alpha=0.45$  for our study with medium reliability, 0.55 in the original version<sup>21</sup> with medium reliability as well, and 0.81 in the translated version<sup>22</sup>), Conscientiousness (Cronbach's  $\alpha=0.79$  for our study, 0.75 in the original version,<sup>21</sup> and 0.80 in the translated version<sup>22</sup>), negative emotionality (Cronbach's  $\alpha=0.67$  for our study, 0.67 in the original version,<sup>21</sup> and 0.81 in the translated version<sup>22</sup>), and open mindedness (Cronbach's  $\alpha=0.72$  in our study, 0.69 in the original version,<sup>21</sup> and 0.81 in the translated version<sup>22</sup>). It consists of 30 items, each scored from 1 to 5 on a Likert scale. Continuous scores are computed according to scoring instructions for each domain. The scale had a reliability coefficient (Cronbach's  $\alpha=0.68$  in our study and 0.61 in the original version).<sup>21</sup>

Quality of life was evaluated using SF-36.<sup>23</sup> This questionnaire evaluates 8 domains: physical functioning (Cronbach's  $\alpha=0.90$  for our study, 0.93 for the original version,<sup>24</sup> and 0.92 in the translated version<sup>25</sup>), bodily pain (Cronbach's  $\alpha=0.86$  for our study, 0.85 for the original version,<sup>24</sup> and 0.97 for the translated version<sup>25</sup>), role limitations due to physical health problems (Cronbach's  $\alpha=0.83$  for our study, 0.96 for the original scale,<sup>24</sup> and 0.91 in the translated version<sup>25</sup>), role limitations due to personal or emotional problems (Cronbach's  $\alpha=0.74$  for our study, 0.96 for the original scale,<sup>24</sup> and 0.91 for the translated version<sup>25</sup>), emotional well-being (Cronbach's

### MAIN POINTS

- Quality of life (QoL) is an important target to be considered in managing people with subjective cognitive decline (SCD).
- Individuals with SCD have a lower QoL compared to controls.
- The impaired QoL is not attributable to other possible moderators such as social and demographic characteristics, concomitant somatic or psychiatric disorders, or physical activity.

$\alpha=0.79$  for our study, 0.95 for the original scale,<sup>24</sup> and 0.89 for translated version<sup>25</sup>), social functioning (Cronbach's  $\alpha=0.73$  for our study, 0.73 for the original scale,<sup>24</sup> and 0.92 for the translated version<sup>25</sup>), energy/fatigue (Cronbach's  $\alpha=0.86$  for our study, 0.96 for the original scale,<sup>24</sup> and 0.91 for the translated version<sup>25</sup>), and general health perceptions (Cronbach's  $\alpha=0.78$  for our study, 0.95 for the original scale,<sup>24</sup> and 0.85 for the translated version<sup>25</sup>). Answers are recoded so that higher composite scores (ranging from 0 to 100) for each domain are directly proportional to higher self-perceived health and QoL. The reliability coefficient for the overall SF-36 was Cronbach's  $\alpha=0.94$  and in the original version the overall coefficient exceeded 0.85.<sup>24</sup> The translated version did not present an overall reliability coefficient but presented the overall mental health status coefficient Cronbach's  $\alpha=0.87$  and overall physical health status coefficient Cronbach's  $\alpha=0.87$ .<sup>25</sup>

### Statistical Analysis

All the analyses were performed using the IBM SPSS Statistics version 26.0 (IBM SPSS Corp.; Armonk, NY, USA). Descriptive statistics were used to characterize the sample. First, we analyzed the normality of distribution using the Shapiro–Wilk test. We used chi-square to analyze categorical variables such as gender, locative status, and the presence of hypertension or type 2 diabetes. We used Student's *t*-test (for normally distributed data) or Mann–Whitney *U* (for non-parametric data) to analyze continuous data such as age, education, and scores for the applied questionnaires. Subjective cognitive decline and control groups were matched for education and age. Descriptive statistics of the data are presented with *n* (%) and, for non-normalized variables (for nonparametric tests) are shown as “median (interquartile range),” and for normalized variables (for parametric tests) are shown as “mean (SD).” The variables which reached statistical significance were included in a binomial logistic regression model in order to eliminate possible confounders. Statistical significance was defined as  $P < .05$ , 2-sided. We have calculated Cronbach's alpha for every scale used.

### Results

A total of 110 individuals were included in the study. After matching for age, sex, education, and MMSE scores, 101 persons were included in the final analysis. There were 66.33% ( $n=67$ ) SCD participants and 33.67% ( $n=34$ ) controls (Table 1). The SCD group had a median age of 63 years (IQR 56-69, Table 1) and 25.37% were male compared to the control group which had a median age of 59.5 years (IQR 52-67, Table 1) and of which 38.24% were male (Table 1). There were no statistically significant differences between the 2 groups regarding social, demographic, and clinical characteristics (Table 1). The SCD group had a higher score of negative emotion ( $P=.043$ , Table 1) compared to controls on the Big Five questionnaire.

Subjective cognitive decline individuals have an overall lower QoL compared to controls (Table 2). Subjective cognitive decline group had poorer physical functioning ( $P=.034$ , Table 2), more limitations in their roles due to their physical ( $P=.010$ ) and emotional problems ( $P=.019$ , Table 2) while reporting feeling more fatigued ( $P=.018$ , Table 2). Results of the full comparison are presented in Table 2.

We included all the statistically significant variables (negative emotion, physical functioning, role limitations due to physical health, role limitations due to emotional problems, and energy/fatigue) in

**Table 1.** Social, Demographic, and Clinical Characteristics of the Groups

Item	SCD (n = 67)	Controls (n = 34)	P
Age	63 (56-69)	59.5 (52-67)	.052
Sex (male)	17 (25.37%)	13 (38.24%)	.181
Education (years)	13 (12-16)	15 (12-17)	.213
From urban (urban area results provided)	42 (62.69%)	22 (64.71%)	.842
Unemployed	50 (74.63%)	23 (67.65%)	.459
BMI	27.55 (24.22-32.02)	26.69 (24.56-30.54)	.558
Systolic BP	125 (120-130)	130 (120-132)	.821
Diastolic BP	70 (70-80)	79 (69.50-84.25)	.610
HR	73 (66-80)	73.5 (68-80)	.880
Hypertension	35 (52.24%)	13 (38.24%)	.183
Type 2 diabetes	12 (17.91%)	4 (11.76%)	.424
MMSE	29 (27-30)	29 (28-30)	.162
HAMD	1 (0-3)	1 (0-3)	.915
HAMA	2 (0-4)	2 (0-5)	.982
IPAQ total	3600 (1386-6300)	3093.5 (1690-6264)	.917
IPAQ sitting	240 (180-450)	300 (240-420)	.164
Big Five			
Extraversion	17.25 (4.41)	17.85 (3.36)	.488
Agreeableness	19.37 (2.92)	19.18 (3.05)	.753
Consciousness	21 (18-25)	21 (19.75-24)	.971
Negative emotion	14.37 (4.14)	12.65 (3.68)	.043
Open mindedness	17.46 (4.39)	17.21 (4.24)	.779

Values are expressed as *n* (%), mean (SD), or median (IQR), as appropriate. BMI, body mass index; BP, blood pressure; HAMD, Hamilton Depression Scale; HAMA, Hamilton Anxiety Scale; HR, Heart Rate; IPAQ, International Physical Activity Questionnaire; IQR, interquartile range; MMSE, Mini-Mental State Examination; SCD, subjective cognitive decline.

a binomial logistic regression analysis. The logistic regression model was not statistically significant  $\chi^2(5) = 10.831$ ,  $P=.055$ .

### Discussion

The objective of our paper was to analyze the influence of SCD on QoL in a cohort of Romanian individuals. We determined that, compared to controls, individuals with SCD reported significantly lower levels of QoL in several domains, including physical functioning, role

**Table 2.** Comparison of Quality-of-Life Items Between SCD and Controls

SF-36 Items	SCD (n = 67)	Controls (n = 34)	P
Physical functioning	75 (55-90)	90 (70-95)	.034
Role limitations due to physical health	75 (25-100)	100 (68.75-100)	.010
Role limitations due to emotional problems	100 (66.67-100)	100 (100-100)	.019
Energy/fatigue	55 (35-75)	70 (58.75-80)	.018
Emotional well-being	72 (52-84)	80 (66-88)	.066
Social functioning	87.5 (62.5-100)	100 (75-100)	.150
Pain	87.5 (62.5-100)	72.5 (47.5-92.5)	.307
General health	60 (40-75)	70 (55-80)	.072

Values are expressed as median (IQR). IQR, interquartile range; SCD, subjective cognitive decline.

limitations due to both physical health and emotional problems and energy. As the 2 groups were matched for demographic, social and clinical factors (covering both psychiatric and somatic illnesses), it seems likely that the difference in QoL was independently correlated with SCD.

Reported levels of physical functioning as well as of energy were significantly lower in the SCD cohort, even though potentially physically limiting diseases such as obesity, hypertension or type II diabetes were no more prevalent than in the control group. In other studies, individuals with SCD were found to prefer more sedentary lifestyles,<sup>26</sup> which might indicate lower levels of overall physical fitness in this group. Longitudinal data indicates that physical fitness is associated with lower odds of cognitive decline, with the cumulative incidence of any form of cognitive impairment being 35% to 38% lower in active individuals.<sup>27</sup> However, a significant portion of the protective effect described is probably owed to the lower incidence of metabolic and cardiovascular somatic diseases in physically active individuals,<sup>28</sup> whereas in our study the difference in perceived physical functioning remained even though these factors were controlled for. This seems to suggest that physical activity has a beneficial effect on cognition independent of its preventive role for other diseases that may induce SCD. This is even more plausible considering that there is a plethora of evidence to indicate that physical activity improves cognitive functioning in individuals who report SCD.<sup>29</sup>

Interestingly, people in the SCD cohort reported suffering role limitations due to physical and emotional health more often than controls, despite there being no significant differences in somatic and psychiatric conditions between the 2 groups. This seems to hint that the underlying cause of the discrepancy may be perceptual in nature. Subjective cognitive decline has been associated with higher levels of neuroticism,<sup>30</sup> which has in turn been associated with a poorer perception of one's own health.<sup>31</sup> In objectively ill individuals, neuroticism increases the impact of pain and functional limitations on self-assessed health.<sup>31</sup> Thus, it is likely that the health-related limitations felt by SCD individuals in our study are the result of negatively biased self-evaluation rather than objective causes.

To our knowledge, this is the first article that investigates SCD in a cohort of Romanian individuals and one of the very few studies that accounts for the effect of other health conditions when assessing the impact of SCD. This is important, as the concept of SCD is still not neatly delineated from other normal or pathological phenomena that occur in old age, and adequately establishing its independent negative impact on the day-to-day life of sufferers represents a step in a clarifying direction.

The limitations of our study include the relatively small sample size which most likely prevented us from detecting smaller associations, such as emotional well-being and general health, both of which fell just short of statistical significance. Strong points include the control group matched for multiple potentially confounding factors such as psychiatric and somatic diseases, sleep quality, and socioeconomic status, as well as inclusion of people both from primary care and clinical settings so that our cohort better reflects the general population.

In conclusion, SCD is associated with significantly worse QoL in 4 out of 8 domains measured by the SF36 scale (physical functioning, role

limitations due to physical health, role limitations due to emotional health, and energy/fatigue). Furthermore, a trend towards lower scores was also observed in 2 other domains (emotional well-being and general health). Potential avenues for future research could include a longitudinal assessment in a similarly matched cohort to provide more insight into the influence of SCD on QoL over time and to better separate it from that of confounding elements.

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**Data Sharing Statement:** Additional data are available upon request.

**Ethics Committee Approval:** This study was reviewed and approved by the Institutional Review Board of the Romanian Alzheimer Society (IRB No. 11/06.03.2020).

**Informed Consent:** Written informed consent was obtained from participants who participated in the study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – A.P., V.M.; Design – A.P., V.M.; Supervision – V.M., C.T.; Materials – A.P.; Data Collection and/or Processing – A.P., R.P., V.M.; Analysis and/or Interpretation – A.P., V.M.; Literature Review – A.P., R.P.; Writing – A.P., R.P., A.R.; Critical Review – A.R., V.M., R.P., C.T.

**Declaration of Interests:** The authors have no conflicts of interest to declare.

**Funding:** The authors declare that this study had received no financial support.

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