



# Subjective Memory Complaints: A Conceptual Analysis

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**Objective:** To clarify the concept and connotation of subjective memory complaints.

**Methods:** A total of 89 papers were retrieved from CNKI, Wanfang Database, VIP database, MedLine, Web of Science, OVID and Scopus. The search time limit was from January 1, 1982 to December 31, 2024. Walker and Avant's conceptual analysis method was applied.

**Results:** Through in-depth analysis, the defining attributes of the subjective memory complaints were memory dysfunction, cognitive decline risk, low help-seeking intentions, and notable memory-related negative emotions. Antecedents involve demographic, lifestyle, psychological, and health-related factors. Consequences include neurodegenerative diseases, anxiety, depression, and reduced quality of life. Multiple assessment tools such as the Subjective Memory Complaints Questionnaire and Memory Assessment Complaint Questionnaire were presented, providing means for measuring SMC in research and clinical practice.

**Conclusion:** Defining this concept aids early screening and intervention for MCI and AD, helping clinical staff develop strategies to improve cognitive function, quality of life, and mental health.

**Keywords:** subjective memory complaints, memory function, cognitive disorder, conceptual analysis, conceptual attributes

## Introduction

The global population of older adults is growing in both number and proportion, with projections estimating that by 2050, the population aged 60 years and older will soar to 2.1 billion.<sup>1</sup> Neurodegenerative diseases associated with aging, particularly Alzheimer's Disease (AD), have emerged as significant public health challenges, adversely affecting the health and quality of life of the elderly and impeding sustainable economic development. Currently, academic communities worldwide have acknowledged that AD represents a continuous pathophysiological process, which progresses through three stages: the subjective memory complaint stage, the mild cognitive impairment stage, and the dementia stage.<sup>2</sup> The onset and progression of cognitive impairment in older adults is a protracted process, potentially commencing several years or even decades prior to the clinical manifestation. Subjective memory complaints (SMC) are commonly construed as an individual's account or perception of memory deterioration, which can present either in the presence or absence of objective indications of memory impairment. It is one of the main symptoms and the most common early clinical manifestations of amnesic Mild Cognitive Impairment (MCI) and AD, and is prevalent among older adults.<sup>3</sup> Over half of community-dwelling older adults experience SMC, with a 6.67% annual progression rate to MCI or AD, typically over 15 years.<sup>4</sup> Memory problems can make SMC patients feel frustrated in their daily lives. The patient's self-care ability, self-efficacy, and life happiness are all lower than those of the normal population, resulting in a low quality of life.<sup>5</sup>

Currently, there is no unified definition and relevant descriptions for SMC. In recent years, there has been a growing emphasis on the development and clarification of knowledge. Moreover, the resolution of conceptual issues has increasingly become a crucial component of knowledge development. When the essence of a concept is ambiguous, it

is likely to cause cognitive biases among researchers and hinder the development of clinical nursing practice and nursing research.<sup>6</sup> Conceptual analysis is an effective method for clarifying concepts that are widely used in multiple disciplines but have ambiguous definitions. Nursing-related conceptual analysis has witnessed rapid development internationally, and the relatively maturely applied methods include Walker and Avant's classic concept analysis method and Rodgers' evolutionary concept analysis.<sup>7</sup> However, from the actual situation of the literature review, perhaps Walker and Avant's conceptual analysis method is more operable and practical and thus is more widely applied in nursing research.

Nowadays, global researchers have conducted extensive studies in the fields of MCI and AD, yet research on the SMC stage remains relatively scarce. Hence, this study employs the classic concept analysis method proposed by Walker and Avant to organize the concept of SMC systematically. By summarizing the defining attributes of SMC, this study intends to enhance nurses' understanding of this concept, promote the progress of SMC-related research, and provide a scientific basis for the future clinical application of prevention, intervention, and management programs related to SMC.

## Methods

### Methods and Analysis

Conceptual analysis entails a comprehensive examination of the fundamental components of a concept to enhance understanding, thereby aiding nursing researchers in both the expansion and development of nursing knowledge. The objective of concept analysis is to scrutinize the structure and function of the concept, as concepts possess inherent attributes that distinguish them from others. Walker and Avant's conceptual analysis method<sup>8</sup> is a modified and simplified adaptation of Wilson's (1963) seminal concept analysis, reducing the process from eleven steps to eight, thereby making it more accessible for novice researchers. The implementation of Walker and Avant's method involves the following steps: 1) selecting the concept; 2) determining the purpose of the analysis; 3) clarifying the application of the concept in the literature; 4) identifying conceptual attributes; 5) constructing a model case; 6) identifying borderline and related cases; 7) analyzing antecedents and consequences; and 8) providing empirical evaluation indicators.

### Data Sources and Collection

The search terms including "subjective memory complaints, subjective memory impairment, subjective cognitive complaints" were searched in CNKI, Wanfang Database, VIP database, MedLine, Web of Science, OVID and Scopus. The search languages were Chinese and English, and the search time limit was from January 1, 1982 to December 31, 2024.

Inclusion criteria: literature involving SMC conceptual attributes, antecedents and consequences, measurement tools, etc.

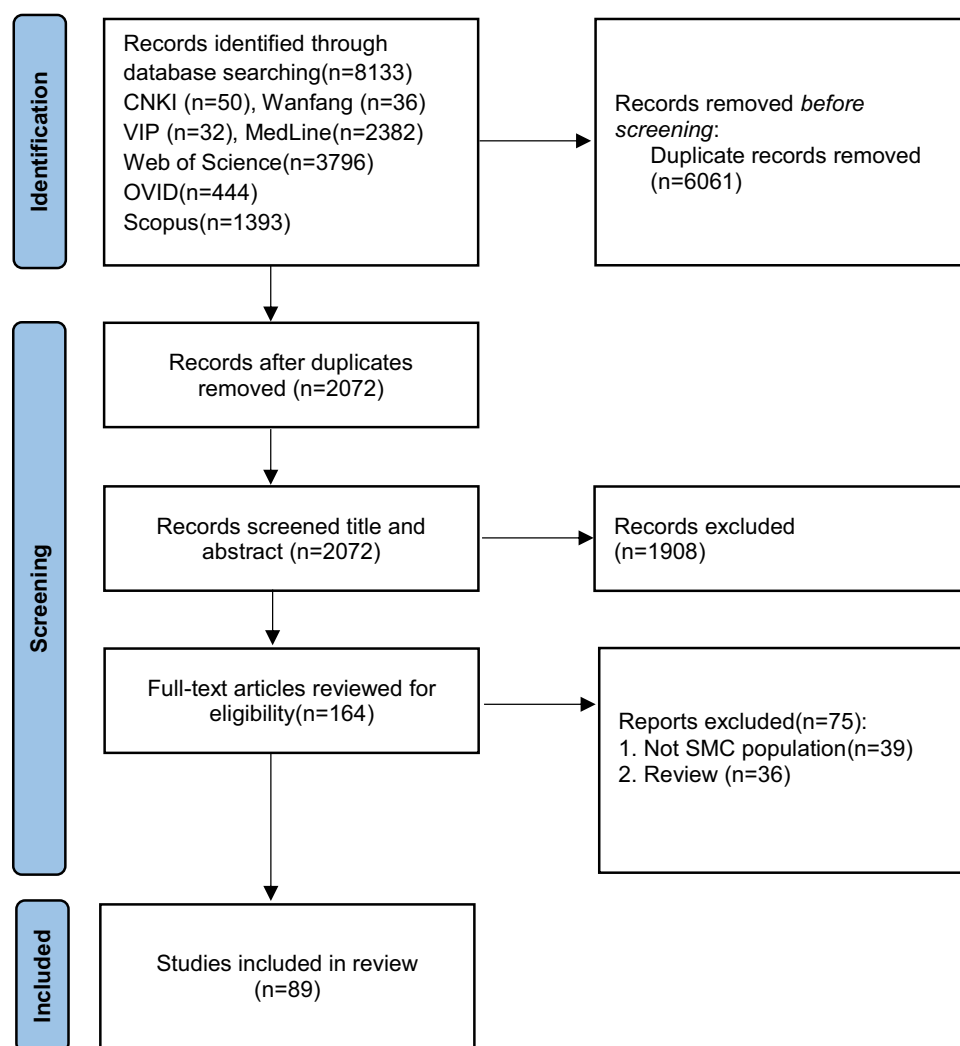
Exclusion criteria: articles that were not related to the subject, were published repeatedly, conference paper or the full text was not available.

A total of 8133 literatures were retrieved, and various types of quantitative and qualitative studies were reviewed by two researchers independently. 2072 literatures remained after removing duplicates. After screening according to title, abstract and full text, finally, 31 Chinese articles and 58 English articles were extracted from them. The literature screening process is shown in [Figure 1](#).

## Results

### Definitions of SMC

The term "Subjective Memory Complaints" (SMC) was initially introduced by Reisberg et al<sup>9</sup> in 1982 to describe individuals who had complaints of cognitive impairments but without objective evidences. In 1986, Crook et al<sup>10</sup> expanded on this by introducing the concept of "age-related memory impairment" (AAMI) and attempted to clarify the criteria for possible memory loss in otherwise healthy elderly subjects. The terminology and concepts surrounding SMC have since been inconsistent due to diverse research perspectives. In an effort to address these inconsistencies, Jessen et al<sup>11</sup> coined the term "subjective cognitive decline" (SCD) in 2014, situating it within the realm of subjective



**Figure 1** Flowchart showing a selection of articles.

cognition. This term denotes a perceived decline in cognitive abilities in the absence of clinically measurable deficits. Concurrently, Chinese researchers, including Dai Zhong,<sup>12</sup> associated SMC with the “forgetfulness” syndrome in traditional Chinese medicine. In 2017, Ellison<sup>13</sup> posited that SMC encompasses an individual’s complaint or report of memory decline, irrespective of the presence of objective memory dysfunction. Currently, it has been determined that SMC mainly focuses on the subjective perception of memory, while SCD encompasses a broader range of cognitive domains, including memory, attention, and executive function. Moreover, SCD is related to cognitive awareness and metacognition.<sup>14</sup> Both suggest the importance of early cognitive function assessment, but they are distinct concepts. Through in-depth analysis, the definition of SMC is a condition characterized by subjective memory dysfunction complaints that occur frequently or are aggravated within the past 12 months, risk of cognitive decline, low willingness to seek help, and significant memory-related negative emotions, but without objective memory dysfunction or impairment of other cognitive domains.

## Conceptual Attributes of SMC

Conceptual attributes can distinguish a concept from other similar ones, help to deepen the understanding and mastery of the concept, and are the characteristics, elements or components of a certain concept, which are also the core content of conceptual analysis.<sup>8</sup> By reading, analyzing, synthesizing and refining relevant materials, the researchers of this study have extracted four conceptual attributes of SMC.

## Memory Dysfunction

Memory consists of three links: memorization, retention and reproduction. It represents the imprint of past experiences and is intricately linked to neuropsychological functions. Memory dysfunction refers to a state in which an individual is unable to remember or recall information or skills, resulting from either permanent or temporary memory disorders due to pathophysiological or situational factors. The relationship between SMC and objective memory dysfunction remains a topic of debate. Research<sup>15</sup> has shown that older adults with SMC exhibit several memory-related characteristics: a decline in memory compared to previous levels; difficulty recalling the names of familiar individuals over both long and short durations; challenges in remembering the locations of placed items and in finding familiar objects; increased difficulty in retrieving words during conversations; and a diminished ability to retain numerical information, such as phone numbers. These observations provide a multifaceted view of the memory status of the elderly and hold significant importance for the evaluation of SMC and cognitive function.

## Cognitive Decline Risk

Cognitive ability refers to the capacity to process, store and retrieve information, serving as a crucial psychological condition for the successful completion of various activities. In comparison to older adults without SMC, those with SMC are at a heightened risk of experiencing cognitive decline, potentially leading to MCI and AD.<sup>16</sup> AD is a major neurodegenerative disorder characterized by continuous and progressive deterioration of cognitive functions.<sup>17</sup> SCD may represent the earliest symptom of AD,<sup>18</sup> manifesting as a self-perceived decline in cognitive ability, often involving memory deterioration and/or impairments across multiple cognitive domains.<sup>19</sup>

## Low Help-Seeking Intentions

SMC patients often fail to recognize the necessity of seeking professional assistance or do not engage with medical institutions for early detection and intervention. Proactive help-seeking behavior among SMC patients is beneficial for early detection, diagnosis, and intervention; however, only a minority of these individuals pursue professional help. The investigation conducted by Li Shijie et al<sup>20</sup> indicates a lack of willingness and initiative among the SMC population to seek professional assistance for their memory issues. The frequency of SMC occurrence in epidemiological investigations is 40.0–80.0%,<sup>21</sup> while the frequency in the population seeking clinical help is 18.6–26.1%.<sup>22</sup> The research by Chinese scholar Tang Bixia et al<sup>23</sup> shows that the proportion of the SMC population seeking help for memory problems is only 14.4%.

## Notable Memory-Related Negative Emotions

Multiple studies<sup>24</sup> have shown that there is a correlation between the perceived decline in memory among individuals with SMC and the negative emotions they experience, such as anxiety and depression. For instance, a study conducted by Jeong Sun Kim et al<sup>25</sup> involving 195 community-dwelling older adults with multimorbidity in Korea, the Subjective Memory Complaints Questionnaire (SMCQ) was utilized to evaluate SMC. The findings revealed a significant positive correlation between SMC and depression, indicating that higher levels of SMC are associated with more severe depressive symptoms. Similarly, Anna Mascherek et al<sup>26</sup> investigated 877 middle-aged and elderly people in Germany and found that there were significant associations between anxiety and depression and SMC. One unit increase in anxiety or depression led to an increase of 6 or 15% in subjective memory performance complaints, respectively. Furthermore, Zhan Nani et al<sup>27</sup> analyzed the cross-sectional data of 8254 elderly individuals from the China Health and Retirement Longitudinal Study database in 2018. It was found that the risk of subjective memory impairment in elderly individuals with depressive symptoms is 1.325 times that of those without depressive symptoms. This indicates that depressive symptoms may lead to negative evaluations of their own memory abilities, thereby increasing the incidence of subjective memory impairment.

## Case Construction

### Constructing a Model Case

A 58-year-old female patient has experienced recent memory loss. Her behavioral responses are slow. She often fails to recall the names of her acquaintances. There have been instances where she holds the keys but still searches for them

everywhere. She scatters things around. For example, she once put the remote-control in the refrigerator. She frequently cannot find the items she needs and always suspects that others have stolen them. Because she cannot remember some past events, she often feels lost and blames herself. She has become depressed and less talkative. After observing these behaviors, the family attempted to take the old lady to the hospital for an examination. Initially, she declined, asserting that her confusion was merely a consequence of aging and remained adamant about not seeking medical attention. Nevertheless, her memory did not improve over the subsequent year, and she continued to experience frequent forgetfulness. Following persistent encouragement from her family, she eventually attended the hospital's memory clinic for an evaluation. The results of her neuropsychological assessment fell within the normal range, precluding a diagnosis of mild cognitive impairment; however, she was found to have mild depression and anxiety.

## Identifying Borderline and Related Cases

A 55-year-old male patient reported a subjective decline in memory, noting a perceived deterioration compared to previous levels. He requested his son's accompaniment to an internal medicine clinic for a comprehensive physical examination. The patient indicated that his capacity to perform daily activities remained intact, and he retained a general recollection of his son's address. Concerning his memory impairment, the patient described frequent forgetfulness and an inability to recall events from his youth, which resulted in mild frustration. Despite these concerns, he expressed a willingness to pursue treatment. However, there was no objective evidence supporting a diagnosis of MCI or AD.

## Antecedents and Consequences

### Antecedents of SMC

#### Demographic Factors

Sociodemographic data include indicators such as age, gender, and educational level. Against the backdrop of an aging population, SMC is more prevalent among women than men and is positively correlated with age and educational attainment.<sup>28</sup> A study exploring the relationship between gender and cognition indicated that women are more likely to experience a decline in cognitive ability than men.<sup>29</sup> As age increases, the incidence of SMC also rises.<sup>30</sup>

#### Lifestyle Factors

Lifestyle factors such as experiencing numerous negative life events and negative stress, having sleep disturbances, lacking exercise and reading are the influencing factors for subjective memory decline.<sup>31</sup> Less social contact, a smaller social network, and less participation in social activities are associated with poorer cognitive function.<sup>32</sup>

#### Psychological and Emotional Factors

The prevalence of mental health problems related to SMC is particularly high, especially affective disorders such as anxiety and depression.<sup>33</sup> Harmful emotional responses to memory problems are more common among elderly people with higher anxiety symptoms.<sup>34</sup> Compared with the healthy control group, the results of neuropsychological assessments of patients with depression showed declines in memory, executive function, and attention, etc.<sup>35</sup> The findings of Tinson et al<sup>36</sup> confirmed that low mood and a high level of perceived disease threat are closely related to complaints of poor memory.

#### Health-Related Factors

According to the framework of the National Institute on Aging in the US,<sup>37</sup> SMC has been classified as the stage prior to the occurrence of mild cognitive impairment in individuals with positive AD biomarkers. Compared with middle-aged people without diabetes, the proportion of patients with type 2 diabetes combined with SMC increased by 19%.<sup>38</sup> Even among the elderly without dementia, SMC is related to poorer objective cognitive performance.<sup>39</sup> Patients with diabetes or hypertension are more likely to have SMC than those without diabetes or hypertension, and patients with both diabetes and hypertension are more likely to develop SMC than those with only diabetes or hypertension.<sup>40</sup> Moreover, recent evidence suggests that genetic factors may contribute to individual differences in susceptibility to cognitive impairment. For instance, Chang et al<sup>41</sup> found that cognitive reserve indices (eg, education, occupational attainment) influence cognitive abilities such as attention/working memory, memory, and language differently across

GBA genotypes (GG vs T alleles), particularly in patients with Parkinson's disease (PD). Yuan et al<sup>42</sup> demonstrated that WWOX/MAF genes affect cognitive functions including verbal fluency and verbal memory in both PD patients and healthy controls, while PD significantly modulates their effects on attention, non-verbal memory, and visuospatial function. These findings highlight the critical role of these genes in PD-related cognitive impairment and their neuropathological link to Alzheimer's disease, potentially informing future research directions aimed at identifying genetic markers of susceptibility to SMC.

## Consequences of SMC

SMC is an early marker of degenerative diseases that lead to cognitive dysfunction, yet it may also represent secondary symptoms caused by the normal aging process, depression or psychological stress.<sup>43</sup> A cross-sectional and longitudinal study has demonstrated that elderly individuals with SMC are more likely to exhibit AD biomarkers, such as cerebral amyloid deposition, hypometabolism of glucose and loss of hippocampal volume.<sup>44,45</sup> The risk of developing AD for SMC patients is four times that of normal elderly people. SMC patients may experience anxiety, depression and anhedonia, which result in a decline in their quality of life and an increase in medical utilization.<sup>46,47</sup> Over time, patients with increasing SMC experience more severe deterioration in information storage and immediate recall.<sup>48</sup>

## Providing Empirical Evaluation Indicators

### Assessment of Subjective Memory Complaints

In 1999, Geerlings et al<sup>49</sup> adopted the assessment of subjective memory complaints to screen and evaluate SMC. Patients were asked the question, "Have you experienced a decline in memory in the past year?" The answers were classified into four categories: 1) No; 2) Yes, but it's not a problem; 3) Yes, and it is a problem; 4) Yes, and it is a serious problem. Selecting any one of the answers 1), 3), or 4) indicated the presence of SMC.

### Subjective Memory Complaints Questionnaire (SMCQ)

The SMCQ was developed by Youn et al<sup>50</sup> in 2009. It consists of 14 items, which are composed of 4 items related to overall memory function (SMCQ-G) and 10 items related to daily memory function (SMCQ-E). A score of 1 was assigned for "Yes" and 0 for "No". The higher the score, the more severe the patient's SMC was. The Cronbach's  $\alpha$  coefficient of the SMCQ was 0.864, making it a concise questionnaire with high reliability and validity for SMC assessment. In 2017, domestic scholar Meng Lingdi et al<sup>51</sup> translated this questionnaire into Chinese and applied it among the elderly population in rural communities. Its Cronbach's  $\alpha$  coefficient was 0.872.

### Memory Assessment Complaint Questionnaire (MAC-Q)

The MAC-Q is a questionnaire developed by Crook et al<sup>52</sup> for self-assessment of current memory based on past memory. It has a total of 6 items. The first 5 questions reflect the specific situations of age-related memory decline in the elderly, and the last question reflects the overall memory decline. This questionnaire uses the Likert 5-point scoring method. The first 5 questions are scored from 1 to 5 points, and the last question on overall memory is scored from 2 to 10 points. The total score ranges from 7 to 35 points, and a score higher than 25 points indicates the presence of memory complaints, with a higher score indicating more severe symptoms. The Cronbach's  $\alpha$  coefficient of this questionnaire is 0.88.

### Short Memory Questionnaire (SMQ)

The SMQ was developed by Lui et al<sup>53</sup> in 2006 based on the Memory Inventory for Chinese. It is suitable for evaluating the subjective memory complaints of elderly subjects within different cognitive ability ranges. The questionnaire includes 5 items, which are answered with "Yes" or "No". A score of 1 was assigned for "Yes" and 0 for "No", and the scores were accumulated. A total score of  $\geq 3$  points indicated the presence of SMC, and the higher the score, the more severe the memory complaint situation was.



## Chinese Version of the Illness Perception Questionnaire - Memory (IPQ-M)

The Chinese version of the IPQ-M was translated into Chinese by Tang et al<sup>54</sup> in 2016 based on the English version. This questionnaire has three parts. The first part includes 19 items; the second part includes 9 dimensions and 44 items; and the third part includes 23 items regarding the possible causes of memory decline perceived by the SMC population. The first part uses a binary variable scoring method, with 1 point assigned for “Yes” and 0 for “No”. The higher the cumulative total score, the more symptoms there are. The second and third parts use the Likert 5-point scoring method. Among them, the scores of the 9 dimensions in the second part were subjected to a *t*-test with the median value of 3 points. The items in the third part are independent of each other and are not accumulated for scoring. The Cronbach’s  $\alpha$  coefficient of this scale is 0.872.

## Discussion

This study’s analysis of Subjective Memory Complaints utilizing Walker and Avant’s method provides valuable insights. The identified conceptual attributes are essential. Memory dysfunction underscores the necessity for refined assessment tools, potentially integrating neuropsychological tests with self-reports. The risk of cognitive decline highlights the importance of early detection; clinicians should perform regular cognitive evaluations for SMC patients, and longitudinal studies are warranted. Low help-seeking intentions necessitate public awareness campaigns and improved healthcare access. Memory-related negative emotions suggest the need for a holistic approach, incorporating cognitive-behavioral therapy and support groups. Demographic factors inform targeted screening efforts. Lifestyle factors underscore the significance of healthy living, and healthcare providers can offer lifestyle guidance. Psychological and health-related factors indicate the need for mental health screening and enhanced chronic disease management. The consequences of SMC underscore the urgency of evidence-based interventions that combine cognitive training, exercise, and psychological support. Nonetheless, the lack of standardized tools and protocols, particularly in China, represents a significant limitation. Future research should prioritize the development and validation of these concepts through multicenter studies.

When discussing SMC, it is important to distinguish between related concepts such as MCI and cognitive frailty. Through conceptual analysis, the differences among these concepts are expounded as follows:

SMC and MCI are different concepts.<sup>55</sup> SMC pertains to an individual’s concern or dissatisfaction with their memory capabilities, typically manifesting as self-reported memory issues, while objective cognitive assessments remain within normal limits. This condition primarily relies on the individual’s subjective perception and is considered an early indicator of potential cognitive decline. Conversely, MCI signifies a mild decline in cognitive function that surpasses normal age-related changes but does not meet the criteria for dementia. The diagnosis of MCI necessitates comprehensive cognitive testing and neuropsychological evaluations, often revealing impairments in memory or other cognitive domains, although the individual’s daily living activities remain largely unaffected. MCI is regarded as a precursor stage to Alzheimer’s disease and other forms of dementia, with a relatively high risk of progression. Therefore, SMC is mainly based on the individual’s subjective perception, while MCI is diagnosed through objective cognitive tests and has higher clinical significance and intervention requirements.

SMC and Cognitive frailty are also different concepts.<sup>56</sup> Cognitive frailty combines the characteristics of cognitive decline and physical frailty, emphasizing the presence of physical health signs such as weight loss and slow gait speed while cognitive function declines. It focuses on the comprehensive management of cognitive and physical health and is regarded as one of the early risk factors for dementia such as AD.<sup>57</sup> SMC mainly focuses on the individual’s subjective perception of memory ability and its relationship with psychological factors such as depression and anxiety, and is regarded as one of the early warning signs of mild cognitive impairment and dementia.

One of the notable innovations of this study is the comprehensive integration of a broad spectrum of factors associated with SMC. Through a systematic exploration of the antecedents, consequences, and conceptual attributes, it presents a more comprehensive perspective in contrast to prior research that typically concentrated on isolated aspects. Besides the utilization of multiple assessment tools and questionnaires, which enhances the understanding of SMC measurement and may facilitate the development of more precise and sensitive assessment modalities in the

future, and the construction of a classic case and related cases that serve as practical illustrations to assist researchers in better grasping the essence of the SMC concept, this study further distinguishes SMC from several similar concepts such as SCD, MCI, and cognitive frailty. By clearly defining these distinctions, this study provides a more in-depth understanding of SMC and sets it apart from related concepts, thus laying a solid foundation for further research in this area.

Despite our efforts, this study has some limitations. The literature search may not have captured all relevant studies, potentially missing some important perspectives. Also, the concept analysis method has its inherent subjectivity, and different researchers might interpret the data slightly differently. Future research should address these issues to further enhance our understanding and management of SMC.

## Conclusion

This study provides a comprehensive analysis of the concept of Subjective Memory Complaints, identifying its core attributes as memory dysfunction, susceptibility to cognitive decline, low propensity for seeking assistance, and significant memory-related negative emotions. The antecedents of SMC encompass demographic, lifestyle, psychological, emotional, and health-related factors. The consequences include the potential progression to neurodegenerative diseases, accompanied by emotional responses such as anxiety and depression, ultimately leading to a diminished quality of life. Recognizing SMC as an early stage amenable to intervention is crucial, as timely screening and intervention can effectively delay cognitive decline and prevent cognitive impairment, thereby mitigating progression to MCI and AD. The definition of this concept holds potential for informing the development of culturally sensitive tools, particularly in underrepresented regions such as China. Current effective interventions for SMC comprise cognitive and exercise interventions, as well as various combined intervention programs. Despite its clinical importance, SMC remains under-recognized in clinical practice, particularly in China, where there is a significant lack of well-established and standardized assessment tools and intervention protocols. Therefore, defining this concept aids early screening and intervention for MCI and AD, helping clinical staff develop strategies to improve cognitive function, quality of life, and mental health.

## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

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