Subjective memory complaints in the geriatric population and related factors: a pilot study in Mexican population

Abstract

Introduction. Subjective Memory Complaints (SMC) represent the individual’s perception of a change in their memory. In the elderly population, a variable frequency of 10 to 90% has been reported. The significance of SMC is still controversial in the geriatric population and there are no studies that have explored the frequency of SMC and their associated factors in Mexico.

Objective. To identify the frequency of SMC using a structured questionnaire, as well as to identify the associated factors in the elderly population.

Methods. A clinical pilot, observational, cross-sectional study of individuals over 60 years old of both sexes. Exclusion criteria: diagnosis of cognitive impairment, dementia or delirium, other neurodegenerative or psychiatric diseases, history of traumatic brain injury, or stroke in the previous six months. Instruments: the Spanish version of the Subjective Memory Complaints Questionnaire (SMCQ), the Folstein Mini-Mental State Examination (MMSE), the Hospital Anxiety and Depression Scale (HADS), and a questionnaire of interest variables were applied.

Results. A total of 100 patients were included: 77 women and 23 men with a mean age of 72.8 years; 96% of the individuals reported at least one SMC, and 53% had significant SMC (>5). There was no observed association between SMC and the MMSE, only a significant correlation with the anxiety and depression scores (HADS) was shown. In addition, elevated education levels, reading habits, and exercise were associated with a lower number of SMC.
**Resumen**

**Introducción.** Las Quejas Subjetivas de Memoria (QSM) representan la percepción del individuo a cerca de un cambio en su memoria. En población adulta mayor se ha reportado una frecuencia variable de entre 10 al 90%. El significado de las QSM aún resulta controversial en la población geriátrica y en nuestro país no existen estudios previos que hayan explorado la frecuencia de QSM y sus factores asociados.

**Objetivo.** Conocer la frecuencia de QSM usando un cuestionario estructurado, así como conocer cuáles son sus factores asociados en población adulta mayor.

**Métodos.** Se realizó un estudio clínico piloto, observacional, transversal. Se incluyó a individuos > 60 años de ambos sexos. Criterios de exclusión: diagnostico de deterioro cognitivo, demencia o delirium, otras enfermedades neurodegenerativas o psiquiátricas, antecedente de trauma craneal o enfermedad vascular cerebral en los 6 meses previos. Se aplicó la versión en español del Subjective Memory Complaints Questionnaire, el Mini mental de Folstein (MMSE), la Escala de Ansiedad y Depresión Hospitalaria (HADS) y un cuestionario de variables de interés.

**Resultados.** Se incluyó un total de 100 pacientes: 77 mujeres y 23 hombres con un promedio de edad de 72.8 años. Se encontró que el 96% de los individuos referían al menos una QSM, y el 53% presentaban QSM significativas (>5). No se observó asociación entre QSM y el MMSE, y solo se demostró una correlación significativa con las puntuaciones de la escala de ansiedad y depresión (HADS). Además, la escolaridad elevada, el hábito de lectura y el ejercicio se asociaron con un menor número de QSM.

**Conclusiones:** Se encontró una elevada frecuencia de QSM (>90%), y éstas se relacionaron con los síntomas de ansiedad y depresión. No se observó asociación con el rendimiento cognitivo y se evidenció que la escolaridad, el hábito de lectura y el ejercicio regular modulan positivamente el número de QSM.

**Palabras clave**

Quejas subjetivas de memoria, deterioro cognitivo, depresión, ansiedad, México.

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**Conclusions:** A high frequency of SMC (>90%) was found, and these were related to the symptoms of anxiety and depression. There was no association with cognitive performance and it was evidenced that education, reading habits, and regular exercise positively modulate the number of SMC.

**Keywords**

Subjective memory complaints, cognitive impairment, depression, anxiety, México.
Introduction

Subjective Memory Complaints (SMC) represent an individual's perceived change in the state that maintains their mnemonic abilities (with respect to a previous state). Even though SMC can present at any age, those occurring in individuals over 60 years old have recently become relevant.1

SMC are one of the main reasons for consultation in the elderly population; however, in clinical studies, the prevalence varies from 12% to 90% of cases.2,3 This variance can be related to issues such as study design, type of population studied, age groups, etc., but one of the most important factors is that there is still no universally accepted and validated questionnaire to measure SMC.4

The relevance of SMC lies not only in their frequency but also in their meaning. There are two positions in the literature with regards to this. On one hand, some studies suggest that such complaints are associated with a lower cognitive performance and indicate an increased risk of developing mild cognitive impairment or dementia in the future.5,6 On the other hand, there is the suggestion that SMC are the manifestation of an altered mood, since in some studies they are only related to the presence and severity of anxiety and depression symptoms.7,8 For this reason, the meaning of SMC is still controversial, which is why it is important to carry out more studies to try to understand their significance and causal factors. To date, there are very few studies conducted in Latin America, and to our knowledge, there are no previous studies on SMC performed in the Mexican population; therefore, this study aims to learn the frequency of SMC and its associated factors in a sample of older adults in Mexico.

Methods

A clinical, observational, cross-sectional, descriptive and analytical study was designed and participants were selected from the different external consultation areas of the National Institute of Rehabilitation “Luis Guillermo Ibarra Ibarra” (INR-LGII). A sample size calculation was not performed since it was an exploratory study, so it was done for convenience. It included all patients over 60 years old, of both sexes, who agreed to participate through informed consent. The following were considered exclusion criteria: previous or current diagnosis of cognitive impairment, dementia or delirium, other neurodegenerative or psychiatric diseases, history of cranial trauma or cerebrovascular disease in the past 6 months, and current consumption of drugs affecting cognitive performance (anticholinergics, benzodiazepines, neuroleptics, etc.). Patients who did not adequately complete all of their evaluations were removed from the study. The Spanish version of the Subjective Memory Complaints Questionnaire (SMCQ) was applied to assess SMC.9 It is a short questionnaire (15 items) which in previous studies has demonstrated adequate reliability (α Cronbach: 0.86) and a good correlation with the neuropsychological evaluations, plus it can be self-applied when a reliable informant does not exist (Appendix 1).

In addition, a cognitive screening was applied through Folstein’s Mini-Mental State Examination (MMSE), the Hospital Anxiety and Depression Scale (HADS),10 and a survey of sociodemographic variables of interest: age, schooling, comorbidities, body mass index (BMI), sleep quality, drug use, etc. Statistical analysis was performed using the statistical program GraphPad Prism version 5.0 using measures of central tendency and dispersion, associations between variables were performed with a Spearman correlation, and categorical variables were analyzed using an X2 or Fisher’s exact test.
Results

A total of 100 patients participated in the study: 77 women and 23 men, with an average age of 72.8 years (SD: 6.3, range 60-89 years) and an average schooling of 9.08 years (SD: 5.5, range 0-20 years). The average BMI was 26.28 (SD: 4.2, range 17-38). Considering this BMI, only 36% of the subjects had a normal weight, whereas 64% had some degree of overweight or obesity. In terms of marital status, 46% of the subjects were married and the other 54% had no partner for various reasons (widowed, separated, divorced, or single). Regarding current work, only 37% had some paid activity. As for other activities, 41% exercised regularly (at least three times a week) and 63% had a regular reading habit. Concerning the subjective quality of sleep, an average score of 7.2 was reported (SD: 2), a score of 4.4 in presence of daytime hypersomnia (maximum 10), and an average of 5.7 hours (SD: 1.9) of nocturnal sleep. Regarding the presence of comorbidities (hypertension, diabetes, dyslipidemia, cancer, heart disease, etc.), only nine patients had none while the average was 2.5 comorbidities per individual (range 0-7). As for SMC, only 4% did not report any, while 96% reported at least one, and the average was 5.2 SMC per individual (SD: 3.4). Figure 1 shows the distribution of cases in relation to the number of SMC. Taking into consideration the cut-off point suggested by the authors of the SMCQ (5 points), we found that 53% of the cases had significant SMC. In regards to cognitive evaluation, the average obtained in the MMSE was 18.5 points (SD: 9.3). Considering the cut-off point of 23 points, it was observed that 15% of the cases presented a score that suggests some degree of cognitive deterioration. The average in the total HADS score was 5.3 points (SD: 3.4) and considering the cutoff point of >15 points for the total HADS, a frequency of 21% of significant anxiety and depression was attained. It is important to note that patients who scored high on the HADS scale or low on the MMSE were channeled for psychiatric or neurological assessments, respectively.

When trying to relate the number of SMC to different variables, we found the following: First, a correlation analysis was performed between the total number of SMC and the variables (age, schooling, BMI, weight, number of comorbidities, subjective sleep quality, hours of nocturnal sleep, daytime sleepiness, MMSE score, and HADS scores) and only a significant correlation was obtained with the different HADS scores. See Figure 1.
Table 1 and Figure 2. Additionally, a significant positive correlation was observed between the MMSE score and the individuals' schooling (Spearman's $r=0.3126$, $p=0.0015$).

Then, an association analysis was performed between the number of SMC and the different categorical variables: sex, occupation, marital status, obesity or overweight, with or without comorbidities, and we did not observe any significant differences. Some significant differences were found, however, when comparing the number of SMC in the groups of patients with or without regular exercise and reading habits. See Figures 3 and 4. In addition, a significant difference was also observed between the groups of individuals with low schooling (<6 years) and high schooling (>9 years), with a higher number of SMC in the low schooling group (figure 5). When we sectioned them into three age groups (60-69, 70-79 and 80+), there was a tendency to present a higher number of SMC as age increased, but this difference was not significant ($p=0.7010$). Finally, when patients were divided into MMSE scores of more or less than 23 points, this did not have an association with the number of SMC.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value de P</th>
<th>Spearman’s r</th>
<th>CI 95%</th>
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<tbody>
<tr>
<td>HADS T</td>
<td>&lt;0.0001</td>
<td>0.512</td>
<td>0.3459 to 0.6473</td>
</tr>
<tr>
<td>HADS A</td>
<td>&lt;0.0001</td>
<td>0.493</td>
<td>0.3231 to 0.6321</td>
</tr>
<tr>
<td>HADS D</td>
<td></td>
<td>0.425</td>
<td>0.2439 to 0.5775</td>
</tr>
</tbody>
</table>

Figure 2. Correlation between the SMC number and the HADS scale scores.
Figure 3. Number of SMC in relation to regular exercise. The bars represent the average ±SME * p=0.0315, Mann-Whitney U.

![Bar chart showing SMC in relation to regular exercise.](image)

Figure 4. Number of SMC in relation to reading habits. The bars represent the average ±SME * p=0.0230, Mann-Whitney U.

![Bar chart showing SMC in relation to reading habits.](image)

Figure 5. Number of SMC in relation to low/high schooling. The bars represent the average ±SME * p=0.0471, Mann-Whitney U.

![Bar chart showing SMC in relation to low/high schooling.](image)
The clinical significance of SMC in the elderly is still a matter of debate. As previously mentioned, there is as much evidence suggesting it may be an indicator of cognitive decline or a risk factor for the development of cognitive impairment, as there is proposing that it is only an alteration of self-perception of the cognitive state caused by mood disorders (anxiety and depression).

To our knowledge, the present pilot study represents the first research of this type in the Mexican population. We consider that some of the main characteristics of the population included in this study are representative of the Mexican population in this age stratum: a female predominance (77%), a low schooling average (9 years), a high incidence of overweight and obesity (64%), high number of comorbidities (91%, average: 2.5), and a low frequency of paid work (37%).

Regarding their exercise habits, the proportion of regular exercise was found at 41%, which we considered to be high; a previous study carried out in Mexico, however, reports a frequency of regular exercise in this age group of up to 70%, though this divergence may be due to the definition of regular exercise used in each study. Regarding reading habits, which were reported in 63% of the cases, we did not find figures in the national literature with which to compare it, although we estimate that it is perhaps a high figure notwithstanding the low level of schooling of the sample. It is important to note that our sample of patients was obtained from an outpatient hospital population (external consultation) which may affect the frequency of comorbidities and pharmacological treatment, as well as other factors which may not be fully representative of the general population.

Another important data to consider is that in our sample the average obtained in the cognitive screening performed with the MMSE was 18.5 points, in addition to the 15% of the individuals who obtained a score suggestive of some degree of cognitive impairment (<23 points). This may be related to the low level of schooling of the patients included, since it has been shown that the educational level has a strong influence on the performance shown in the MMSE. On the other hand, the observed frequency of 15% of patients with probable cognitive deterioration is high if we take into account that previous studies carried out in our country have observed a frequency of 7% of cognitive impairment in people over 65 years old. This may be due to the fact that the present study involved a hospital population with low schooling and a high frequency of SMC which may affect the incidence of cognitive impairment observed. In addition, it should be considered that the cognitive evaluation used (MMSE) does not really allow to diagnose cognitive deterioration with certainty since it is only a cognitive screening instrument, so it is possible that some of these patients may have undiagnosed dementia.

Another important source of discrepancy is the instrument used to search for cognitive complaints. Since there is no universally accepted or standardized questionnaire, some studies are based only on one or two non-specific questions about the opinion of the state of their memory, and others use structured questionnaires with dichotomous (yes/no) responses, or even Likert-like scores which undoubtedly greatly affects the frequency
of SMC reported in each study. Furthermore, although some questionnaires explore several cognitive domains, most focus on aspects related to memory, so it is debatable to say we’re talking about cognitive complaints when in reality it is only memory complaints. In this study, we used the Spanish version of the SMCQ (Appendix 1), which is a brief self-application tool that has demonstrated adequate internal consistency and a significant correlation with neuropsychological performance in patients with cognitive impairment. Additionally, this instrument contains questions that, in addition to exploring possible flaws in different aspects of memory in the daily environment, also allows us to estimate the degree of functional impact that these complaints have on the patient’s life. However, we must consider that when applying an instrument that intentionally interrogates the state of memory of individuals, this can increase the frequency of reports of complaints when compared with spontaneous complaints that the patient could offer—something which has, incidentally, already been investigated and demonstrated in recent studies.

Another of the main objectives of this study was to try to identify the factors associated with the presence and the number of SMC. In the correlation analysis, a significant association of the number of SMC was observed only with the severity of the symptoms of anxiety and depression that the HADS scale measures. This association was most significant in the test’s total score, followed by the anxiety score, and finally in the depression score. These findings coincide with those extensively described in other literature on cognitive complaints, especially in cross-sectional studies. It is important to note here that the frequency of anxiety-depressive symptoms observed in this study (21%) coincides with that reported in the international literature, although there is also great variability in these figures—for instance, a study in the Mexican geriatric population observed the incidence of depression was over 41% which suggests that it is a prevalent disorder in this age group.

In order to explain this association between SMC and symptoms of anxiety and depression, different hypotheses have been proposed. The most common is that SMC is actually an altered perception of the cognitive state caused by the coexisting symptoms of anxiety and depression—that is, that the older adult patient with anxiety and depression may pay more attention or magnify some cognitive errors that are not really significant. This might lead us to assume that depressive symptoms should also affect the performance of individuals in cognitive assessments; however, at least in our study, there was no significant correlation between the HADS scale score and the score obtained by the MMSE (p=0.1942), even when only patients with more severity in their emotional symptoms were considered (HADS >15) this association was not observed (p=0.1421). In other words, anxiety and depression appear to have no significant influence on cognitive performance.

It is important to note that in our study there was no association between the current cognitive performance and the number of SMC. A relationship was found only between the level of schooling and the number of SMC, with a greater number of complaints in the low schooling group (<9 years). This, together with the observation that regular physical activity, as well as a reading habit, seems to decrease the number of SMC, suggests that all these factors may generate a greater cognitive reserve in these patients, thus reducing the number of SMC, as has been widely reported before. It cannot be ruled out completely, though, that factors such as exercise and reading may also have an effect by decreasing anxiety and depression in these patients.

It is also relevant to note that the presence of depression in itself (regardless of cognitive complaints) is considered an important risk factor for the development of cognitive impairment or dementia, so that depressive symptoms may actually be an indicator of early neurochemical dysfunction predisposing them in some way to cognitive deterioration, in this group of patients.

Although the relationship between SMC and cognitive performance is obviously very complex,
it is interesting to remark that some studies, especially longitudinal studies and studies in which some biomarkers (amyloid beta) have been measured, do suggest that SMC appear to raise the risk of cognitive impairment.28,29 Recent studies show that cognitive complaints reported by an informant seem to be more closely related to cognitive performance and to the risk of future cognitive impairment.30 This difference between the cross-sectional and longitudinal studies suggests that perhaps the cognitive changes that occur in patients with SMC are actually very dynamic and highly dependent on each individual, so that only the long-term and serial evaluations allow us to notice changes in the cognitive status that cross-sectional studies cannot demonstrate.

Finally, it should be pointed out that due to the limitations of our study, because it was a pilot study, the sample was very small, and a broader neuropsychological evaluation was not performed, nor were functional scales used to distinguish patients with functional impairment associated with cognitive impairment. Therefore, more studies will be required in the future—especially longitudinal studies using broad and standardized neuropsychological batteries that consider both spontaneous complaints as well as complaints recalled by memory, and take the point of view of an external informant to improve the methodological quality of the studies and to be able to know with greater certainty the implications of SMC in this age group.

Appendix 1. Spanish Version of the Subjective Memory Complaints Questionnaire9

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>1. Do you think you have a problem with your memory?</td>
<td></td>
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<tr>
<td>2. Do you think that your memory is worse now than it was 10 years ago?</td>
<td></td>
<td></td>
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<tr>
<td>3. Do you think that your memory is worse than that of other people your same age?</td>
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<td></td>
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<tr>
<td>4. Do you feel that your daily life is more complicated now because your memory has diminished?</td>
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<tr>
<td>5. Have you had difficulties remembering a recent event?</td>
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<tr>
<td>6. Have you had difficulties remembering a conversation you had a few days ago?</td>
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<tr>
<td>7. Have you had difficulties remembering a commitment you made a few days ago?</td>
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<tr>
<td>8. Are you experiencing difficulty recognizing the faces of people close to you?</td>
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<tr>
<td>9. Are you having difficulty remembering where you have left things?</td>
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<tr>
<td>10. Have you lost things more frequently now?</td>
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<tr>
<td>11. Have you got lost or gone astray somewhere outside your home?</td>
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<tr>
<td>12. Have you had trouble remembering to get two or three articles when you go shopping for groceries?</td>
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<tr>
<td>13. Do you have trouble remembering to turn off the stove or the lights in your house?</td>
<td></td>
<td></td>
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<tr>
<td>14. Do you have trouble remembering the phone numbers of your children?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Do you think these memory problems have interfered significantly in your daily life?</td>
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</tbody>
</table>
Conclusions

In this pilot study, a high frequency of SMC (>90%) was found, and these were mainly associated with the symptoms of anxiety and depression. No association was observed with cognitive performance and it was also evidenced that factors such as schooling, reading habits, and regular exercise seem to modulate positively the number of SMC in this sample of patients. More extensive and longitudinal studies will be necessary in order to be able to know more precisely the meaning of SMC in the elderly population.

Conflict of interest statement
The authors declare there are no relevant conflicts of interest in this study.

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References


