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Subjective memory complaints and their relation with verbal fluency in active older people

Queixa subjetiva de memória e a relação com a fluência verbal em idosos ativos

Keywords

Older People
Memory
Epidemiology
Public Health
Speech, Language and Hearing
Sciences

Descritores

Idoso
Memória
Epidemiologia
Saúde Pública
Fonoaudiologia

ABSTRACT

Purpose: To verify subjective memory complaints and their relation to verbal fluency in older people participating in community groups. **Methods:** An epidemiological quantitative study performed in community groups for older people in Florianópolis, state of Santa Catarina, Brazil. Data were collected by structured interview using the Memory Complaint Questionnaire (MAC-Q) and the Verbal Fluency Test (VFT) by semantic categories “animals/minute”. For an inferential descriptive analysis, data with $p < 5\%$ were considered. **Results:** Self-reported memory complaints were found in 35.7% of the sample. No association or correlation of VFT with the perception of memory obtained by MAC-Q, nor with its score was found. The VFT analysis of individuals who reported negative perception of memory presented statistical significance. We found significant association between the perception (MAC-Q score) and presence of memory lapses (reported by the older people in question and added to the questionnaire). **Conclusion:** We found no relation between subjective memory complaints and verbal fluency of active older people. Mnemonic complaints were correlated to the negative perception of memory and to the duration of the complaint. However, subjective memory complaints were an indicator for those individuals with negative perception of memory, being one aspect that must be considered in older people’s speech when investigating a possible cognitive deterioration. Such data can assist in formulating public health care policies aimed at older people in the city, which emphasizes the importance of verifying subjective memory complaints in this population.

RESUMO

Objetivo: Verificar a queixa subjetiva de memória relacionada com a fluência verbal em idosos participantes de grupos de convivência. **Método:** Trata-se de um estudo epidemiológico, quantitativo, realizado em grupos de convivência de idosos do município de Florianópolis, Estado de Santa Catarina. Os dados foram coletados por meio de entrevista estruturada utilizando-se o Questionário de Queixas de Memória (MAC-Q) e o Teste de Fluência Verbal (TFV) por categorias semânticas animais/minuto. Para a análise descritiva inferencial, consideraram-se os dados com $p < 5\%$. **Resultados:** Foi encontrada a queixa de memória autodeclarada em 35,7% da amostra. Não houve associação e correlação do TFV com a percepção da memória obtida pelo MAC-Q bem como com o seu escore. A análise do TFV com os indivíduos que referiram percepção negativa de memória apresentou significância estatística. Salienta-se que foi encontrada associação significativa entre a percepção (escore do MAC-Q) e a presença da queixa de memória (referida pelos idosos em questão acrescida ao questionário). **Conclusão:** Não houve relação entre a queixa subjetiva de memória e a fluência verbal de idosos ativos, sendo as queixas mnemônicas correlacionadas à percepção negativa da memória e ao tempo de queixa apresentada. Porém a queixa subjetiva da memória se mostrou um indicativo para aqueles indivíduos com percepção negativa da memória, sendo um aspecto que deve ser considerado na fala dos idosos ao se investigar um possível declínio cognitivo. Tais dados podem auxiliar no direcionamento das ações de políticas públicas de assistência às pessoas idosas no município, salientando-se a importância em se verificar a queixa subjetiva de memória dos idosos.

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Received: June 01, 2016

Accepted: September 20, 2016

Study carried out at Coordenadoria Especial de Fonoaudiologia, Universidade Federal de Santa Catarina – UFSC - Florianópolis (SC), Brazil.

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Financial support: nothing to declare.

Conflict of interests: nothing to declare.

INTRODUCTION

The Brazilian population profile has been changing according to the demographic and epidemiological transition⁽¹⁾, and such aspects point to a narrowing of the base and an enlargement of the top of the age pyramid, which is a feature of developed countries⁽²⁾. Every year, the Brazilian population gains about 650,000 newly older people. According to projections, by 2020 Brazil will reach the sixth worldwide position in population number with the contingent of more than 30 million Brazilians over the age of 60 years⁽³⁾, and some authors estimate that this population will add up to 65 million in 2050⁽²⁾.

Therefore, Brazil is becoming a country with aged population and, in the context of epidemiological transition, the profile of population diseases changes, with increase in the prevalence of chronic noncommunicable diseases. Dementia syndromes, in particular Alzheimer's, are among such diseases, with impact on cognition of the affected individuals⁽⁴⁾.

The integrality of the cognitive function in older people contributes to the autonomy and capacity of self-care, enabling their independence and safety. The decline in cognitive skills becomes a factor associated with the increased risk of difficulty in performing instrumental activities of daily living and even difficulties in the social conviviality, which can cause depression and isolation⁽⁵⁾.

During the aging process, it is natural for some cognitive functions to mitigate, such as attention, executive functions, and memory⁽⁶⁾, with the slowing of information processing⁽⁷⁾.

With population aging, it is necessary to try to identify whether the difficulties related to the cognitive processes are within the standards of normality or characterize dementia processes⁽⁸⁾. One of the consequences of aging that older people most fear is cognitive decline. Thus, studies are needed to investigate risk factors associated with this decline. Such aspect is due to knowing that the decline will affect the performance of daily life activities, generating great impact on social and occupational activities of individuals⁽⁹⁾. Thus, early identification of cognitive decline may help to create strategies to promote cognitive activities, in order to slow the impact on the individuals' daily life⁽¹⁰⁾.

Some cognitive deficits involve memory, which is the most frequent cognitive complaint in older people⁽⁴⁾. It is known that the decline that occurs in episodic memory is more marked than that of semantic memory – the latter being used to access language materials during the aging process⁽⁷⁾. Cognitive decline develops into dementia only in some cases, showing that memory complaints can be considered part of the concept of metamemory, i.e., perceptions and self-evaluations of memory⁽¹¹⁾.

Some authors pointed out that a periodic screening on subjective memory perception can be an action in the primary health care, since the need for monitoring the cognitive performance of individuals who present the complaint is indisputable⁽¹²⁾.

Verbal fluency can be considered an indicator of executive functions, storage capacity of the semantic memory system, capacity to retrieve information stored in memory and, especially, capacity to organize thoughts and word retrieval. Performance failure in the verbal fluency test may be related to dementia processes, affecting cognitive aspects⁽¹³⁾.

Therefore, this study aims to relate subjective memory complaints to verbal fluency in active older people who take part in community groups in Florianópolis, Santa Catarina, Brazil.

METHODS

This is an epidemiological quantitative cross-sectional study carried out in community groups of older people in the city of Florianópolis. The list of community groups was provided by *Secretaria Municipal de Assistência Social* [Municipal Department of Social Welfare], totaling 3,694 older people from Community Groups. For the sample calculation held according to Miot⁽¹⁴⁾, a prevalence of 50% of older people with subjective memory complaints was considered, with 95% confidence, 5% margin of error, and 10% possible losses, totaling a minimum sample of 383 individuals. Statistical analysis was performed with MedCalc, version 16.2.0 (MedCalc Software bvba, Ostend, Belgium, 2016). The following tests were performed: Chi square, Kruskal-Wallis, Jonckheere-Terpstra, Spearman's rank correlation coefficient (r_s), and Odds Ratio (OR), considered significant when p-values < 5%.

Our study had as inclusion criteria individuals over 60 years participating in community groups of the aforementioned city who accepted to take part in the study by signing an informed consent form. As exclusion criteria, our study adopted the presence of cognitive complaints that prevented them from answering the proposed questionnaires; declaring visual and/or hearing deficit without correction; presence of other conditions that impaired cognition such as depression (not treated), psychiatric diseases (both reported by the participants), and/or communication difficulties that made the speech impossible to be understood.

Data were collected by structured interview with two questionnaires, adding to them the participants' date of birth and their years of study. The first is the Memory Complaint Questionnaire (MAC-Q) and the second is the Verbal Fluency Test (FVT) by semantic categories "animals/minute".

MAC-Q has six questions related to the memory functioning in everyday activities. The answers are scored on a five-point Likert-type scale and range from "much better now" to "much worse now." The total score ranges from 7 to 35 points. The higher the score, the greater the intensity of complaint regarding memory, and scores ≥ 25 indicate memory impairment associated with age, allowing to classify the older adult as having "negative" complaint of memory^(15,16). In addition to this criterion, another one was established for the perception of complaint of older adults. For this, a question was added to the questionnaire about the presence or absence of memory complaint and, if so, for how long this complaint has been constant.

The second instrument applied was the Verbal Fluency Test (semantic categories "animals/minute"). This test consists of asking the individual to say the largest possible number of animals in a minute. It aims at verifying language, semantic memory, and executive functions, evaluating the word retrieval ability established in the long-term memory. Cutoff points were adopted according to education level. Scores of less than nine animals for individuals with up to eight years of study and less than 13 for individuals with eight or more years of study indicate cognitive dysfunction⁽¹⁷⁾.

This research follows the recommendations of Resolution no. 466/2012 of the National Health Council and is approved by the Human Subject Research Ethics Committee by CAAE: 34981514.2.0000.0118. All participants signed the informed consent form.

RESULTS

The sample was composed of 386 older people, with average age of 72.27 years, most of them (95.9%) being female. The descriptive analysis with the absolute and relative frequencies of the scores verified for VFT and MAC-Q can be observed in Table 1. In the sample, 138 (35.7%) older people reported memory complaint (according to the answer to the question added to MAC-Q).

Table 2 shows the statistical tests performed and their findings to evaluate the relations between the different studied variables. We observed a statistically significant positive correlation between the duration of memory complaint and MAC-Q scores ($r_s=0.210$; $p=0.0192$) as well as in the analysis performed only with older people who presented negative perception ($r_s=0.206$; $p=0.0377$). The analysis carried out between VFT and MAC-Q scores with those individuals who had negative perception presented statistical significance ($p < 0.05$).

We found statistically significant positive correlation between VFT scores and the education level of the older people, with a

Spearman's coefficient (r_s) of 0.188 ($p=0.0002$). However, we observed no correlation between the age of individuals and MAC-Q scores, or between MAC-Q scores and VFT scores.

The evaluation of the scores obtained in MAC-Q and in the education level categories by Kruskal–Wallis and Jonckheere–Terpstra tests did not indicate significant association (test for comparing medians of scores obtained in the questionnaires according to education level groups). Similarly, we observed, by the Chi square test, no association between age and memory perception, or between education level and memory perception (in this association test, we used negative or positive categorization for memory impairment based on the scores obtained in MAC-Q, and groups categorization according to established education level).

Regarding the association of memory perception (by MAC-Q) with the individual's answer to the question added to the questionnaire (presence of memory complaint), we observed statistically significant association, by Chi square test, as presented in Table 2. In our analysis, 183 older adults had negative memory perception by in relation to MAC-Q, but, of these, only 111 complained about memory in the formulated question. Another measure of statistically significant association was the Odds Ratio ($OR=9.992$, $p < 0.0001$), allowing to observe that older people without complaint also present more chances (almost 10 times more) of having positive perception in relation to MAC-Q.

Table 1. Characteristics observed for the older people of the community groups in Florianópolis (SC), Brazil, 2015

Characteristics	n	%	x	SD	Median	Min	Max
Female	370	95.90					
Male	16	4.10					
Age (years)	386	100	72.28	7.91	71	60	95
FVT (scores)			12.63	4.45	13	0	28
MAC-Q (scores)			24.45	4.41	24	7	35

Caption: x = mean; SD = standard deviation; Min = minimum; Max = maximum

Table 2. Association measures (associated variables, statistical tests performed, and results obtained) carried out with the frequencies of answers to memory perception, duration of the complaint, age, and education level of older people from the community groups in Florianópolis (SC), Brazil, 2015

Associated variables	n	Statistical Test	r_s or χ^2 or W or z or OR	95%CI	p
Duration of the Complaint × MAC-Q Scores	129	Spearman's Rank Correlation Coefficient (r_s)	0.210	0.0343 to 0.366	0.02
Duration of the Complaint × MAC-Q Scores (individuals with negative perception)	102	Spearman's Rank Correlation Coefficient (r_s)	0.206	0.0121 to 0.385	0.04
VFT × MAC-Q Scores (individuals with negative perception)	183	Spearman's Rank Correlation Coefficient (r_s)	-0.144	-0.284 to 0.001	0.05
Education level × VFT Scores	385	Spearman's Rank Correlation Coefficient (r_s)	0.188	0.0893 to 0.282	0.0002
Age × MAC-Q Scores	384	Spearman's Rank Correlation Coefficient (r_s)	-0.010	-0.110 to 0.089	0.84
VFT Scores × MAC-Q Scores	384	Spearman's Rank Correlation Coefficient (r_s)	-0.074	-0.173 to 0.026	0.15
Education level × MAC-Q	383	Kruskal–Wallis (W)	3.555	(-)	0.31
Education level × MAC-Q	383	Jonckheere–Terpstra (z)	1.736	(-)	0.08
Age × Perception	386	Chi square (χ^2)	46.667	(-)	0.07
Education level × Perception	385	Chi square (χ^2)	5.529	(-)	0.13
Perception × Complaint	385	Chi square (χ^2)	93.129	(-)	< 0.0001
Perception × Complaint	385	Odds Ratio (OR)	9.992	6.047 to 16.511	< 0.0001

DISCUSSION

This study sought to investigate the relationship between subjective memory complaints, evaluated by the MAC-Q, and cognitive performance, evaluated by the FVT. Additionally, we investigated the relation between memory complaint and cognitive performance with education and age ranges, presence and time of complaint, and memory perception.

The female gender was prevalent in this study. The literature on the subject has documented a predominance of women with memory complaints. Silva et al.⁽¹⁸⁾ concluded that women had greater perception of memory decline than men. However, in this study, we were not able to show significant differences in the distribution between men and women because the most of the studied population was female, thus making difficult the detection of gender-related differences. Guerreiro et al.⁽¹⁹⁾ found a proportion of women (90.2%) higher than that of men (9.8%) among older people with memory complaint, but they stressed that the high value was expected by the greater presence of women in the studied population. This fact reflects the tendency of both greater survival of women and participation in groups when compared with men.

The results also suggest that the subjective memory complaint obtained with MAC-Q does not vary according to education level ranges. Such data is in line with the study by Paulo and Yassuda⁽¹¹⁾.

There was no increase in the MAC-Q score correlated to the participants' age, according to the studies of Lima-Silva and Yassuda⁽²⁰⁾ and Mota et al.⁽¹⁰⁾, in which older participants did not show worse performance or more memory complaints. However, in our research we observed the correlation between the duration of the complaint with MAC-Q and negative memory perception, since the longer the time of memory complaint, the worse its perception.

The participants of this study took part in community groups from various regions of the city. We highlight that the activities carried out in the community groups visited for our data collection were related to several actions, such as: singing, dancing, bingo, handicraft (embroidery and painting), as well as religious and commemorative activities, in addition to the organization of tours and excursions. Authors point out that such groups and activities stimulate leisure activities that provide satisfactory experiences in old age⁽²¹⁾.

We had prevalence of women (95.9%) in the studied sample. One can relate such factor to the fact that women tend to get in touch with new people and expand their circle of friends, attending more social spaces (such as groups), unlike men, who commonly are the financial providers of the house and rarely participate in these activities, sometimes showing resistance or prejudice in participating in these meetings⁽²²⁾.

We observed a statistically significant relation between memory perception and complaint about the issue. According to a study by Jacinto et al.⁽²³⁾, complaints regarding memory difficulties were present in 59.27% of older people, confirming the study by Mattos et al.⁽¹⁶⁾ who showed that 53.5% of their research participants presented subjective memory complaints. Older people who present mnemonic impairment, even if not pathological,

tend to complain about memory with higher frequency⁽¹¹⁾. Authors⁽¹⁸⁾ pointed out that memory complaints are part of subjective memory and are associated with a set of knowledge, beliefs, perceptions, and feelings that individuals may have about their cognitive performance, the latter being a larger concept named metamemory. It is expected that individuals with more positive perception of memory have higher performance in memory tasks.

Concerning VFT, we observed that the score increases as the education level increases. Brucki and Rocha⁽²⁴⁾ analyzed 257 healthy older people without mnemonic complaint. They observed that the education level significantly affected the total number of animals in the VFT. This influence persisted after the division of the group by education level, with statistically significant difference between the groups with less and more than eight years of education.

In our sample, we did not find a relation between subjective memory complaint and the VFT, as observed by Paulo and Yassuda⁽¹¹⁾ and Silva et al.⁽¹⁸⁾. These authors observed in the regression analyses that the scores from MAC-Q were not predictive of cognitive performance in the employed tests.

Also, the VFT score was correlated with the negative memory perception. This is due to the fact that the negative perception of older people regarding their own memory is one of the possible evidence for their inferior performance⁽²⁵⁾. Thus, it is important to observe the self-perception that individuals have about their health such as paying attention to memory complaint.

Considering that the VFT based on categories has great sensitivity⁽²⁶⁾ to distinguish individuals with no cognitive changes from those in the early stages of Alzheimer's disease⁽²⁴⁾, its conduction becomes important and feasible because of the time spent for its application.

The complaint of the aged population in the mnemonic performance of activities of daily living is an aspect of investigative relevance, given that the subjective complaint can predict the evolution of dementia processes^(23,27). In addition, regardless of the increase or not in cognitive impairment, it is essential to investigate the factors that may be related to the perception of memory malfunction, since the complaint already indicates dissatisfaction and may harm their well-being and quality of life⁽²⁷⁾.

The World Health Organization emphasizes that actions aimed at public policies involving dementia and focusing on Alzheimer's disease must be developed, because, in addition to being considered a public health problem, the lack of knowledge on it contributes to fears about its appearance and promotes stigmatizing practices, which may lead to the individuals' discrimination. The stigma affects the lives of those who have dementia and their caregivers or family members, leading to social isolation and delay in the search for help and diagnosis⁽²⁸⁾.

Since this study was carried out only with active older people participating in community groups, generalized considerations should be limited to the active older people of the Florianópolis. The aged participants still retain their autonomy, being inserted into an environment in which they perform daily life activities (such as keeping in touch with friends and family), cultural

and religious activities, and physical activities, which may be contributing as a protection for their cognitive functions⁽²⁵⁾.

Although Lima Argimon et al.⁽²⁹⁾ consider that the aging process is characterized by bodily changes in physical and cognitive level, there are also changes in the subjective perceptions. In the aging process, cognitive changes can be considered normal, containing gains and losses: while some skills diminish with age, others tend to remain stable or even improve.

The absence of subjective memory complaints and the maintenance of cognitive performance have been considered indicators of successful aging⁽²⁷⁾. Caramelli and Beato⁽³⁰⁾ reported that memory complaints can be associated with a specific situation, and may not be related to a current cognitive deficit, but they are an indicator of high relevance to future cognitive impairment.

Older people with subjective memory complaints on their performance in daily life activities, even with normal cognitive performance, can develop Alzheimer after two years of clinical follow-up. Stress, symptoms of depression, and low self-esteem are pointed out as predictors of subjective memory complaint⁽²⁷⁾.

Therefore, we suggest further research to continue the investigations on memory complaints, and the inclusion of older people in several situations, considering the heterogeneity of this group and contributing to the understanding of the relation between complaints and cognitive performance in population level.

CONCLUSION

We found no relation between subjective memory complaints and verbal fluency of active older people, and mnemonic complaints had statistically significant correlation with the negative memory perception and the duration of the complaint.

Our study presented some limitations, since it consisted only of active older people, which may not represent the population profile of the Brazilian older people. However, since there was evidence of cognitive decline, it is necessary to think about the direction of public policy actions, particularly those directed to health aspects of the aged population, thinking about the reality of a growing need for care and treatment for this population, aiming to promote health throughout life, including the promotion of a healthy life, healthy environments, and disease prevention, thus minimizing costs in several sectors of society.

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Author contributions

FRB and AMAB contributed in the preparation, development, and writing of the manuscript; FRB, CKM, MCS, MJM, and AMAB held the data collection and analysis and the writing of the manuscript; FRB, MJM, and AMAB contributed to the development, data analysis, and review of the manuscript.