Original Article

https://doi.org/10.1590/2317-6431-2021-2468

Audiology Communication Research
ISSN 2317-6431

Memory self-assessment of university students

Autoavaliação da memória de jovens universitários

Crislaynne Kelly Carvalho de Melo[1], *Antônio Vitor da Silva Roseno*[1], *Arthur José Lopes da Silva*[2], *Tayná Fernandes Pessoa*[1], *Gabrielly Alves de Santana*[1], *Libini Evelyn de Souza Santiago*[1], *Déborah Lúcia Feitosa Montenegro*[1], *Larissa Nadjara Almeida*[3], *Ivonaldo Leidson Barbosa Lima*[3]

ABSTRACT

Purpose: To investigate the memory self-assessment of university students. **Methods:** Observational, cross-sectional, analytical study with a quantitative approach. A total of 519 students regularly enrolled in higher education institutions participated, with a mean age of 22.9 years (±5.5), being 408 women and 111 men. Data was collected through the Prospective and Retrospective Memory Questionnaire (PRMQ-10) and a questionnaire with sociodemographic information and memory complaints related to academic activities. Data were evaluated quantitatively, descriptively and inferentially, using the Chi-Squared Test with a p-value <5%. **Results:** University students reported frequent memory difficulties, especially in the prospective and short term memory. It was found that 46.6% of the participants had memory complaints and 62.8% reported believing that routine at the university may lead to an increase in memory failure. In the self-assessment, 47.7% reported difficulties in prospective and short-term memory and, in relation to the academic routine of university students, 46.4% reported difficulties in retrospective memory. **Conclusion:** There is an association between the presence of a memory complaint and the self-assessment of memory data.

Keywords: Memory; Self-evaluation; Higher education; Students; Neuropsychology; Speech-Language and Hearing Sciences

RESUMO

Objetivo: analisar a autoavaliação da memória de jovens universitários. **Métodos:** trata-se de um estudo observacional, transversal, de caráter analítico, com abordagem quantitativa. Participaram 519 estudantes, matriculados regularmente em instituições de ensino superior, com média de idade de 22,9 anos (±5,5), sendo 408 mulheres e 111 homens. Os instrumentos utilizados foram o Questionário de Memória Prospectiva e Retrospectiva - QMPR (Prospective and Retrospective Memory Questionnaire - PRMQ-10) e um questionário com informações sociodemográficas e com queixas de memória relacionadas às atividades acadêmicas. Os dados foram analisados quantitativamente, de forma descritiva e inferencial, com uso do teste Qui-quadrado, considerando o valor de p<5%. **Resultados:** os jovens universitários relataram dificuldades frequentes de memória, em especial na prospectiva e de curto prazo. Foi visto que 46,6% dos participantes apresentaram queixas de memória e 62,8% referiram acreditar que a rotina na universidade pode provocar aumento nas falhas de memória. Na autoavaliação, verificou-se que 47,7% mencionaram dificuldades na memória prospectiva e de curto prazo e, em relação à rotina acadêmica dos universitários, 46,4% relataram dificuldades na memória retrospectiva. **Conclusão:** há associação entre a presença de queixa e os dados da autoavaliação da memória.

Palavras-chave: Memória; Autoavaliação; Ensino superior; Estudantes; Neuropsicologia; Fonoaudiologia

Study conducted at Speech-Language Pathology Course, Centro Universitário de João Pessoa – UNIPÊ – João Pessoa (PB), Brazil.
[1]Curso de Fonoaudiologia, Centro Universitário de João Pessoa – UNIPÊ – João Pessoa (PB), Brasil.
[2]Curso de Ciência da Computação, Universidade Federal da Paraíba – UFPB – João Pessoa (PB), Brasil.
[3]Departamento de Fonoaudiologia, Centro Universitário de João Pessoa – UNIPÊ – João Pessoa (PB), Brasil.
Conflict of Interests: No.
Authors' contribution: CKCM was responsible for the study design and conception, data collection, analysis and interpretation and article writing; AVSR, AJLS, TFP, GAS, LESS and DLFM were responsible for data collection and tabulation; LNAA was responsible for data analysis and interpretation and article review; ILBL was responsible for guiding all stages of the study.
Funding: None.
Corresponding author: Ivonaldo Leidson Barbosa Lima. E-mail: ivonaldo.lima@unipe.edu.br
Received: January 26, 2021; Accepted: June 06, 2021

INTRODUCTION

University life can be defined as a period of transformation, which includes changes and challenges in the student's life, and the expectation of this new phase of life demands an individual adaptive process to meet all the responsibilities of the academic space[1].

In Brazil, there are more than eight million university students enrolled in educational institutions, divided between 37,000 courses offered by public and private entities. According to studies focused on the socioeconomic profile of students, 54.6% of the students enrolled in educational institutions are women, with a mean age of 24.4 years. In addition, 51.2% of students are black or brown and 64.7% completed high school in public schools[2].

In general, the university demands of the Brazilian education system follow the traditional passive learning model with classes and tests alternating with seminars and mandatory curricular internships. It is known that the pace of classes and social demands generate stress in the university environment, which, associated with other personal factors, leads to the development of anxiety, depression or psychosomatic illnesses. It should be noted that this stress factor is related to an imaginary competitiveness, which causes mental overload in students[3].

In addition to these mental health complaints, university students also report experiencing memory failures, such as difficulty in memorizing and/or remembering information, which may impair the daily academic activities of these individuals[4].

In this context, memory works as the repository of the mind that stores learned and acquired content[5]. Therefore, it is an essential support for the acquisition of new information and the practice of any daily activity that requires remembering learned knowledge. By storing information in memory, a representation of knowledge is mentally constructed, which is required to manage learning and solve daily and future problems.

In this sense, university students require the efficient use of several memory resources to perform everyday tasks, such as memorizing certain contents to write on their supports, performing mental operations to reflect or master certain knowledge and remember information for taking tests and seminars. Thus, the presence of memory failures in university students may impair the performance of various routine tasks of this group.

In this context, some studies report that memory complaints in young people are closely related to anxiety and stress[6-7]. Therefore, it is important to investigate memory complaints in university students, since this population is more susceptible to stress and anxiety behaviors, due to the more stressful routine, whether due to the demand of the university and due to work overload for some young people.

Thus, it is essential to investigate the memory complaints of university students in their academic routine, as the maintenance or expansion of these difficulties may lead to more overload and weaken their reasoning, memorization, motivation and interest in the learning process[8].

In this sense, identifying and analyzing the memory complaints of young university students may contribute to the identification of memory systems most influenced by the demands of higher education and to enable the development of targeted strategies to mitigate these complaints and improve the quality of academic life. Thus, this study aimed to investigate the memory self-assessment of university students.

METHODS

This is an observational, cross-sectional, analytical study with a quantitative approach that was approved by the Human Research Ethics Committees of the Centro Universitário de João Pessoa - CEP/UNIPÊ, under the Protocol no. 3.918.533.

The study included 519 students regularly enrolled in higher education institutions, aged between 18 and 54 years, with a mean age of 22.9 (±5.5). The sample was selected for convenience in a non-probabilistic way, meeting the following inclusion criteria: students of both genders who were regularly enrolled in universities and were over 18 and under 54 years of age.

On the other hand, the authors excluded individuals who had any comorbidity that, for some physical or cognitive reason, made them unable to understand and respond to the instruments proposed in the study, or that could affect the findings - such as the diagnosis of neurocognitive or neurodevelopmental disorders and psychiatric treatment at the time of the study.

Data collection was carried out between April and May 2020 through an electronic questionnaire that was promoted through social networks. At first, students were informed about the objectives and procedures of this study, as well as its risks and benefits. Then, those who agreed to participate in the study signed the Informed Consent Form (ICF) to authorize the start of data collection.

After that, the participants completed a questionnaire with sociodemographic information, such as age, gender, marital status, course, course shift, course degree, day/night work activity, workload, presence of memory complaints, if they had some type of brain injury or a history of psychiatric treatment and other clinical information.

Later, the university students completed the Prospective and Retrospective Memory Questionnaire (PRMQ-10)[9], which was selected due to the possibility of extracting self-assessment measures from different memory systems in the studied population. . This instrument includes ten items related to the self-assessment of daily short- and long-term memory difficulties, five related to prospective memory and five related to retrospective memory. Each item is assessed by a 5-point Likert scale: (1) Never; (2) Rarely; (3) Sometimes; (4) Quite often; and (5) Very often.

After the questionnaire, the participants also answered eight questions prepared by the researchers, with two questions with a "yes" or "no" answer, in order to identify whether the student believed that their daily routine caused memory failures and whether they would like to receive information about memory care. Finally, the other six questions assessed memory complaints in the academic environment and included a 5-point Likert scale: (1) Never; (2) Rarely; (3) Sometimes; (4) Quite often; and (5) Very often.

After all data collection procedures, data were entered into a digital electronic spreadsheet to perform descriptive and inferential statistical analysis using the Statistical Package for Social Sciences (SPSS) v20.0.

Descriptive analysis found data on mean, standard deviation and relative and absolute frequencies, while inferential analysis found an association between the presence of memory complaints and difficulties in self-assessment of memory using the Chi-Squared Test. A significance level of 5% was adopted to all assessments.

RESULTS

With regard to the sociodemographic profile of the 519 participating students, the results showed that 78.6% (n=408) were female, 39.5% (n=205) studied in the night shift and 14.8% (n=77) were in the 3rd term of the undergraduate course. In addition, 43.5% (n=226) of the students worked during the day, 11.6% (n=60) had a history of psychiatric treatment, 46.2% (n=240) claimed to have memory complaints and 62,8% (n=326) agreed that the routine at the university could cause memory failures. In addition, 91.9% (n=326) of the participants reported that they would like to receive information about memory care (Table 1).

Regarding the aspects observed through the PRMQ-10, most students reported having greater difficulty in the questions related to prospective memory and short-term memory (as shown in Table 2). This can be observed since 47.8% (n=248) complained of memory failures when they decided to do something in a few minutes, but then forgot to do it; in addition, 43.4% (n=225) reported forgetting something they were told a few minutes ago; 35.5% (n=184) did not remember to take something they intended when leaving the house, even if the object was in front of them; and 40.5% (n=210) of the students forgot to give a message or an object that they were asked to give it to a visitor (Table 2).

As for self-reported memory difficulties related to academic routine, 46.4% (n=241) of students often forgot the names of close people; 40.5% (n=210) reported that they studied for the tests, but fail to remember the content at the time of the exam; and 36.6% (n=190) often forgot the content discussed in the classroom (Table 3) .

Finally, there was an association between the presence of memory complaints by students and the self-assessment of memory difficulties. It should be noted that those who reported memory complaints also reported a higher frequency of failures in self-assessment of mnemonic functioning in everyday situations, academic or not (Table 4).

DISCUSSION

In this study, most university students reported memory complaints and agreed that the routine at the university can cause such failures and, as so, they would like to receive information about memory care.

The university environment includes a broad range of responsibilities, which makes emotional control a challenge for most young people in this new environment. In this context, the load of activities prioritizes positions that require more time and focus from the student, whether in the classroom or in the future work environment. Therefore, the high workload

Table 1. Sociodemographic profile of students

VARIABLES		N	%
Gender	Male	111	21.4
	Female	408	78.6
Shift	Full-time	145	27.9
	Day	92	11.7
	Afternoon	205	39.5
	Evening	77	14.8
Term	1st	59	11.4
	2nd	43	8.3
	3rd	77	14.8
	4th	37	7.1
	5th	57	11.0
	6th	52	10.0
	7th	72	13.9
	8th	59	11.4
	9th	37	7.1
	10th	26	5.0
The student works during the day	No	293	56.5
	Yes	226	43.5
The student works at night	No	481	92.7
	Yes	38	7.3
History of psychiatric treatment	No	459	88.4
	Yes	60	11.6
Memory complaint	No	240	46.2
	Yes	279	53.8
Do you believe that routine at the university causes an increase in your memory gaps?	No	191	36.8
	Yes	326	62.8
Would you like to receive more memory care information?	No	42	8.1
	Yes	477	91.9

Subtitle: N=Number of subjects; %=Percentage

Table 2. Self-assessment - Prospective and Retrospective Memory Questionnaire

QUESTIONS	Never		Rarely		Sometimes		Quite often		Very often	
	N	%	N	%	N	%	N	%	N	%
Do you decide to do something in a few minutes' time and then forget to do it?	3	0.6	69	13.3	248	47.8	129	24.9	70	13.5
Do you fail to recognize a place you have visited before?	163	31.4	204	39.9	101	19.5	34	6.6	17	3.3
Do you fail to do something you were supposed to do a few minutes later even though it's there in front of you, like take a pill or turn off the kettle?	69	13.3	139	26.8	167	32.2	98	18.9	46	8.9
Do you forget something that you were told a few minutes before?	21	4.0	101	19.5	225	43.4	102	19.7	70	13.5
Do you forget appointments if you are not prompted by someone else or by a reminder such as a calendar or diary?	47	9.1	162	31.2	154	29.7	100	19.3	56	10.8
Do you fail to recognize a character in a radio or television show from scene to scene?	208	40.1	195	37.6	75	14.5	25	4.8	16	3.1
Do you fail to recall things that have happened to you in the last few days?	65	12.5	136	26.2	191	36.8	85	16.4	42	8.1
Do you intend to take something with you, before leaving a room or going out, but minutes later leave it behind, even though it's there in front of you?	46	8.9	127	32.9	184	35.5	96	18.5	66	12.7
Do you fail to mention or give something to a visitor that you were asked to pass on?	42	8.1	127	24.5	210	40.5	88	17	52	10
Do you forget what you watched on television the previous day?	95	18.3	185	35.6	154	29.7	59	11.4	26	5.0

Subtitle: N=Number of subjects; %=Percentage

Table 3. Self-assessment of memory difficulties related to academic routine

QUESTIONS	Never		Rarely		Sometimes		Quite often		Very often	
	N	%	N	%	N	%	N	%	N	%
Do you often forget the names of people close to you?	241	46.4	165	31.8	71	13.7	26	5.0	16	3.1
Do you usually forget the deadline for academic activities?	100	19.3	179	34.5	136	26.2	62	11.9	42	8.1
Do you fail to memorize schedules of academic disciplines?	143	27.6	151	29.1	112	21.6	62	11.9	51	9.8
Do you forget your exam dates?	196	37.8	149	28.7	94	18.1	55	10.6	25	4.8
Do you often forget the content discussed in the classroom?	23	4.4	140	27.0	190	36.6	106	20.4	60	11.6
Do you study but fail to remember the content at the time of the exam?	18	3.5	122	23.5	210	40.5	95	18.3	74	14.3

Subtitle: N=Number of subjects; %=Percentage

of studies can lead to anxiety and, consequently, cause memory failure in this population.

These findings are in line with other studies that also report that complaints and memory failures are common among university students and may be associated with the presence of anxiety and stress[7,10]. Accordingly, these aspects can negatively impact the cognitive processes of university students, causing difficulty in memorization and recall. In addition, anxiety may increase the rate of complaints in prospective and retrospective memory[11], as shown in this study, in which participants reported different memory difficulties, especially in prospective and short-term memory.

It should be noted that prospective memory is defined as the ability to remember to perform future actions, which is present in the individual's daily activities and its functioning involves executive functions[12], such as planning, working memory, inhibitory control and cognitive flexibility, that enable individuals to direct their behavior towards goals and to achieve good performance in future activities.

The academic environment requires the full functioning of these functions, whic allow the student the ability to plan and carry out tasks, think, retain, manipulate and memorize information. Therefore, impairments in these skills may lead to difficulties in acquiring new skills, reasoning, concentrating and memorizing new information[8].

In academic activities, university students presented complaints in retrospective and short-term memory. Retrospective memory refers to memories of past events, while short-term memory is

Table 4. Association between self-assessment and the presence of memory complaints

QUESTIONS	Presence of complaint	Never		Rarely		Sometimes		Quite often		VO		p-value
		N	%	N	%	N	%	N	%	N	%	
Do you decide to do something in a few minutes' time and then forget to do it?	No	2	0.8	58	24.2	142	59.2	33	13.8	5	2.1	<0.001*
	Yes	1	0.4	11	3.9	106	38	96	34.4	65	23.3	
Do you fail to recognize a place you have visited before?	No	100	41.7	105	43.7	27	11.3	6	2.5	2	0.8	<0.001*
	Yes	63	22.6	99	48.6	74	26.5	28	10	15	5.4	
Do you fail to do something you were supposed to do a few minutes later even though it's there in front of you, like take a pill or turn off the kettle?	No	44	18.3	93	38.8	69	28.7	27	11.3	7	2.9	<0.001*
	Yes	25	9	46	16.5	98	35.1	71	25.4	39	14	
Do you forget something that you were told a few minutes before?	No	18	7.5	75	31.3	118	49.2	23	9.6	6	2.5	<0.001*
	Yes	3	1.1	26	9.3	107	38.4	79	28.3	64	22.9	
Do you forget appointments if you are not prompted by someone else or by a reminder such as a calendar or diary?	No	39	16.3	104	43.3	70	29.2	21	8.8	6	2.5	<0.001*
	Yes	8	2.9	58	20.8	84	30.1	79	28.3	50	17.9	
Do you fail to recognize a character in a radio or television show from scene to scene?	No	125	52.1	86	35.8	22	9.2	3	1.3	4	1.4	<0.001*
	Yes	83	29.7	109	39.1	53	19	22	7.9	12	4.3	
Do you fail to recall things that have happened to you in the last few days?	No	50	20.8	88	36.7	76	31.7	24	10	2	0.8	<0.001*
	Yes	15	5.4	48	17.2	115	41.2	61	21.9	40	14.3	
Do you intend to take something with you, before leaving a room or going out, but minutes later leave it behind, even though it's there in front of you?	No	37	15.4	69	28.7	90	37.5	28	11.7	16	6.7	<0.001*
	Yes	9	3.2	58	20.8	94	33.7	68	24.4	50	17.9	
Do you fail to mention or give something to a visitor that you were asked to pass on?	No	31	12.9	79	32.9	94	39.2	27	11.3	9	3.8	<0.001*
	Yes	11	3.9	48	17.2	116	41.6	61	21.9	43	15.4	
Do you forget what you watched on television the previous day?	No	61	25.4	99	41.3	65	27.1	9	3.8	6	2.5	<0.001*
	Yes	34	12.2	86	30.8	89	31.9	50	17.9	20	7.2	
Do you often forget the names of people close to you?	No	144	60	73	30.4	20	8.3	3	1.3	0	0	<0.001*
	Yes	97	34.8	92	33	51	18.3	23	8.2	16	5.7	
Do you usually forget the deadline for academic activities?	No	66	27.5	98	40.8	52	21.7	14	5.8	10	4.2	<0.001*
	Yes	34	12.2	81	29	84	30.1	48	17.2	32	11.5	
Do you fail to memorize schedules of academic disciplines?	No	93	38.8	78	32.5	51	21.3	12	5	6	2.5	<0.001*
	Yes	50	17.9	73	26.2	61	21.9	50	17.9	45	16.1	
Do you forget your exam dates?	No	131	54.6	68	28.3	31	12.9	8	3.3	2	0.8	<0.001*
	Yes	65	23.3	81	29	63	22.6	47	16.8	23	8.2	
Do you often forget the content discussed in the classroom?	No	18	7.5	97	40.4	88	36.7	28	11.7	9	3.8	<0.001*
	Yes	5	1.8	43	15.4	102	36.6	78	28	51	18.3	
Do you study but fail to remember the content at the time of the exam?	No	12	5	72	30	109	45.4	34	14.2	13	5.4	<0.001*
	Yes	6	2.2	50	17.9	101	36.2	61	21.9	61	21.9	

*Significant values (p≤0.05) – Chi-Squared Test. **Subtitle:** N=Number of subjects; %=Percentage; VO=Very often

related to the duration of information, that is, the lower storage capacity for a short period on a scale of duration of minutes to hours[13].

Thus, information stored in short-term memory quickly disappears or becomes long-term memory, which has unlimited storage capacity, that is, the information can remain in the system for days, weeks or even years[14]. Given the above, memory has great value in the routine of young university students, being as an important cognitive resource in learning and helping them to carry out their daily practices[15]. Therefore, difficulties in these memories may affect the expected performance in academic activities, such as forgetting the contents covered in the classroom and fail to remember the content at the time of the test.

The researchers also investigated the association between the presence of memory complaints by students and the self-assessment of memory difficulties, and it was found that students who reported memory complaints in the sociodemographic information questionnaire also reported a higher frequency of memory failures in their daily lives (related to studies or not).

This data shows that cognitive self-assessment is a relevant instrument that can be used for screening and monitoring at the university level. One of the early signs of cognitive memory impairment is forgetting recent events and repeating the same question or report over and over. Thus, any changes experienced in memory should be investigated, as such failures may be a result of cognitive impairment associated or not with psychological factors, such as anxiety, depression and stress[16-18].

If university students ignore their complaints and memory difficulties, their academic performance can be negatively influenced and, without early treatment, such difficulties can lead to losses in daily life, making it impossible to carry out their activities successfully. Thus, it is worth mentioning the

importance of developing strategies that contribute to the identification of these complaints by university students and to the adoption of due care in the prevention of memory failures.

Regarding memory care, practices that can help university students to prevent and minimize memory complaints and failures should be developed and structured. This includes, for example, practicing physical activities, as individuals who practice them regularly are less vulnerable to a cognitive decline, when compared to those who are not physically active[19]. In addition, a healthy diet with fruits and vegetables[20] and regular sleep are important to effectively allow for the consolidation of memory[21].

These findings are in line with those of a study that aimed to assess the memory and functional capacity of elderly people who were physically active and elderly people who were not physically active. This study found that physically active elderly people had better memory performance when compared to elderly people who were not physically active[22].

In addition to a healthy diet and physical activities, computerized cognitive training can also be performed, which aims to improve and prevent cognitive decline and can be performed online, with the aid of software, intensively and with level adjustment of complexity[23]. A study[24] carried out a computerized cognitive training in the elderly, for eight to ten weeks, in order to improve cognitive skills and, at the end of the training, it was possible to find the best performance in memory skills, auditory attention and processing speed.

As playing requires concentration, memory, strategy, teamwork and focus to achieve goals, the use of playful resources for cognitive stimulation and learning enhancement is also a very common strategy, including memory games, reasoning, attention, word searches, among others[25]. In addition, reading is also understood to be a basic condition for the proper functioning of memory, as it improves visual and auditory perception, in addition to expanding the capacity of the mind and stimulating creativity[26].

Finally, clinical interventions may also contribute to the better functioning of cognitive aspects[27]. From this perspective, an interdisciplinary work can be performed with a speech-language pathologist and a psychologist in order to promote cognitive-linguistic aspects, as well as the prevention of possible changes, better cognitive performance and, consequently, the improvement of functionality in the daily life of the university student.

Thus, intervention and stimulation of cognitive skills can support the routine of university students and could be carried out in the academic environment, through spaces to promote cognitive health, aiming to contribute to the adaptation of students to the academic life, thus improving their development and mental health.

Therefore, the speech-language pathologist is one of the professionals trained to act in these aspects through the development of actions that favor the stimulation and resolution of complaints and difficulties of this population, thus aiming to contribute to the good cognitive functioning of university students in academic life.

CONCLUSION

Memory complaints are common among university students, with a higher frequency of short-term and prospective memory difficulties. As shown in the results, there is an association between the presence of a memory complaint and the self-assessment of memory data.

In this sense, it should be noted that memory plays an important role in the academic context and university students believe that their memory failures are impacted by the university routine. Therefore, it is necessary to develop strategies for the promotion of cognitive health in higher education and for the early identification of mnemonic issues.

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