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RESEARCH

Effects of health education in the elderly with mild cognitive impairment

Efeitos da educação em saúde em idosos com comprometimento cognitivo leve

Efectos de la Educación en Salud en adultos mayores con Disfunción Cognitiva Leve

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ABSTRACT

Objective: to analyze the effects of health education on both cognition and depressive/anxiety symptoms in the elderly with Mild Cognitive Impairment (MCI). **Method:** this is a randomized and controlled clinical trial. Participants (n = 22) were recruited from a specialized outpatient clinic, and assigned into two groups: a Health Education Group (HEG) (n = 10) and a Control Group (CG) (n = 12). The participants were evaluated before and after the intervention, which was composed of classes and dynamics. The intervention consisted of 20 meetings, over a period of five months. The assessment was performed by means of the Addenbrooke's Cognitive Examination – Revised (ACER), the Mini-Mental State Examination to access participant's cognitive state, and the Beck's Scale to access depressive/anxiety symptoms. A Memory Complaints Scale (EQM) was also used. The analysis was carried out using the Student's t test for paired samples. **Results:** the HEG group demonstrated an improvement in attention/orientation (p = 0,026), memory (p = 0.001), language (p = 0.033), and ACE-R (p = 0.003). On the other hand, the CG did not present improvement. **Conclusion:** the results highlight the importance of non-pharmacological interventions in older adults with MCI to reduce cognitive deficits.
Descriptors: Elderly; Cognition; Mild Cognitive Impairment; Health Education; Gerontology.

RESUMO

Objetivo: Analisar o impacto da educação em saúde na cognição e nos sintomas depressivos e ansiosos em idosos com comprometimento cognitivo leve. **Método:** ensaio clínico randomizado e controlado. Amostra (n = 22) composta por Grupo Educação em Saúde (GES) (n = 10) e Grupo-Controle ativo (GC). Idosos procedentes de um ambulatório especializado foram avaliados durante cinco meses, em um total de 20 encontros, antes e após a intervenção intercalando aulas e dinâmicas. Para tanto, foram aplicados testes de cognição (Addenbrooke's Cognitive Examination-Revised – ACER; Mini Exame do Estado Mental - MEEM) e avaliados sintomas depressivos, ansiosos (Escala de Beck) e queixa de memória (EQM). Na análise, utilizou-se o Test t de *student* para amostras pareadas. **Resultados:** O GES apresentou melhora na atenção/orientação (p = 0,026), memória (p = 0,001), linguagem (p = 0,033) e no ACE-R (p = 0,003). Não houve melhora significativa no GC. **Conclusão:** destaca-se a importância da intervenção não farmacológica com esta clientela para amenizar déficits cognitivos.
Descritores: Idoso; Cognição; Comprometimento Cognitivo Leve; Educação em Saúde, Gerontologia.

RESUMEN

Objetivo: Analizar los efectos de la educación en salud en la cognición y síntomas depresivos y ansiosos en adultos mayores con Disfunción Cognitiva Leve. **Método:** Se trata de un ensayo clínico aleatorizado y controlado. Muestra (n = 22) compuesta por Grupo Educación en Salud (GES) (n = 10) y Grupo Control Activo (GC) (n = 12). Los participantes adultos mayores fueron de un ambulatorio especializado. Se evaluaron antes y después de la intervención, intercalados entre las clases y dinámicas con duración de 20 sesiones, durante 5 meses, por pruebas de cognición (Addenbrooke's Cognitive Examination-Revised-ACER; Mini- Examinación del Estado Mental, MEEM), síntomas depresivos, ansiosos (Escala de Beck) y queja de memoria (EQM). En el análisis se ha utilizado el Test t de

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student para muestras apareadas. **Resultados:** El GES presentó mejora en atención/orientación (p = 0,026), memoria (p = 0,001), lenguaje (p = 0,033) y en ACE-R (p = 0.003). No hubo ninguna mejoría signicativa en el GC. **Conclusión:** Estos resultados destacan la importancia de la intervención no-farmacológíca en los adultos mayores con CCL para atenuar déficits cognitivos.
Descriptores: Adultos Mayores; Cognición; Disfunción Cognitiva Leve; Educación en Salud; Gerontología.

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INTRODUCTION

Demographic data obtained from the 2010 Census show that the Brazilian population is made up of 190,755,799 habitants. This represents a growth of 12.3% when compared to the 2000 Census. The proportion of older adults aged 65 or more increased in the same period: from 5.9% in 2000, to 7.4%, in 2010. In addition, there was a decline in the number of children and teenagers from 40.1% to 32.8%. Projections suggest an increase of 12.9% in the elderly population by 2020[1].

In parallel to the demographic transition process, Brazil has been facing an epidemiological transition process. Associated with the aging process, it is possible to notice the high prevalence of chronic diseases, such as dementia and its consequences (i.e., cognitive impairment and loss of autonomy)[2].

Mild Cognitive Impairment (MCI) is considered a pre-clinical dementia stage, and is known for the presence of cognitive decline while the individual's daily activities are unimpaired[2-3]. MCI can impact the ability to perform complex tasks, even if the individual does not present the criteria for a dementia diagnosis[4]. There are two types of MCI: amnestic and non-amnestic. Amnestic Mild Cognitive Impairment (aMCI) suggests a greater risk for dementia due to Alzheimer's disease (AD), being characterized by a decline in memory, and may occur only in this cognitive domain (memory) or in multiple domains (memory and other cognitive functions)[5]. On the other hand, the most commonly impaired cognitive domain in non-amnestic Mild Cognitive Impairment (naMCI) is language, although naMCI can affect only language or multiple cognitive functions[5].

The prevalence of MCI varies according to the diagnosis criteria. A recent study revealed a high prevalence rate (36.7%) with greater incidence in men[6]. Brazil demonstrates the same pattern as other countries, for every 1,000 older adults, 13.2 present a clinical stage of MCI (prevalence of 6.1%)[7]. In addition, the annual conversion rate from MCI to AD is about 8.5%[2].

Maintenance of cognition is important to promote independence and autonomy of the elderly. Furthermore, cognitive stimulation can delay, or even prevent the degeneration process in the brain[8]. In this context, Health Education (HE) can be an effective non-pharmacological intervention for older adults as it provides a better understanding of the human needs. HE may be highlighted as health-promotion regarding the awareness of responsibilities and health related rights, both at individual and collective levels. In addition, HE stimulates teaching-strategy actions based on technical-scientific knowledge that lead to an individual's transformation[9].

HE is a strategy structured in dialogues, in which one may find thinking and action. This strategy is based on building democratic relationships and environments that offer knowledge exchange. In addition, there is a compromise with humanization, which includes respect of geographical, social, political, and cultural characteristics of the person, family, and community[10]. This educative practice uses active learning methods. As a result, the goal is to support people changing themselves as they seek a better quality of life, as well as healthier habits [11].

The benefits related to HE interventions are enormous. The literature suggests that promoting a collective and stimulating environment, where participants are oriented to seek a novel meaning for their lives, as well as to acquire new information and knowledge, and to perceive their health status as equal to, or even better than others of their age, bringing positive results to both the lifestyle and cognitive performance of participants[12]. It is also important for older adults with MCI to participate in cognitive stimulation activities, especially due to the possibility of reducing the conversion to AD in this population[13-14].

It is believed that proper cognitive functioning in the elderly is vital to live independently and with a good quality of life. Thus, interventions conducted by gerontologists, such as HE meetings, are important to promote physical, psychical, and emotional health in senior citizens.

OBJECTIVE

The aim of this study was to verify the effects of HE on cognition, as well as on anxiety and depressive symptoms among MCI older adults of a specialized outpatient service in a city of Sao Paulo state.

METHODS

Ethical aspects

This study was approved by the Research Ethics Committee of the Federal University of Sao Carlos.

Before each evaluation, an informed consent form was read with the participant. After reading, both the elderly individual and the researcher signed the form. Two equal forms were signed, one was given to the participant, and the other was attached to the evaluation.

Study design, place and period

This is a randomized and controlled clinical trial.

MCI participants, both in the control (CG) and intervention (HEG) groups, were obtained from a Cognitive and Behavioral Outpatient Clinic of a Federal University in a city in the state of Sao Paulo. This clinic began its activities in 2010. Currently, it works as a Center of Medical Specialties, with around 350 older adults cared for per year. These patients present different neurological disorders; however, the most prevalent is dementia (60%).

HE activities were conducted at an Open University for the elderly in Sao Carlos (UATI), São Paulo, being a public project which has developed its activities for 20 years. In addition to being close to the outpatient clinic, UATI was chosen as it is easy for the elderly to access. The meetings took place from August to December 2015, every Tuesday, from 3:15 to 4:15 pm.

Sample and inclusion and exclusion criteria

Initially, the sample size was calculated considering α = 0.05, and a power of 80%. It was found that 44 subjects were necessary (22 in each group). However, due to the difficulty of finding MCI patients in a short time, the decision was made to run this experiment with a final sample of 22 individuals (10 HEG and 12 CG). For this framework, the power was 70.7%, for a significance level of 0.05 and minimally detected difference of the means (ACER).

Participants were 60 years old or more; had a diagnosis of MCI certified by a doctor; were capable of understanding the information given by the researchers during data acquisition; and were present in more than 75% of the activities. Excluded participants were those who presented severe mental disorders, or other diseases which made their participation impossible; had hearing or visual problems; were illiterate; and/ or scored more than 14 on the QMC22 (Cognitive Changing Questionnaire 22), which can be used either for cognitive screening or to help the differential diagnosis between dementia and MCI[15].

Study protocol

The evaluation protocol was applied during the first semester of 2015. It was composed of:

Sociodemographic and clinical data

The sociodemographic questionnaire was composed of simple questions related to age, schooling, gender, occupation, and marital status. In addition, participant health information was collected using questions regarding diagnosed diseases, usage of medicines, lifestyle (smoking and regular physical activity), and height and weight to measure the Body Mass Index (BMI).

Cognitive data

Addenbrooke's Cognitive Examination-Revised (ACE-R)[16], was used to evaluate cognition. This instrument aims to evaluate six cognitive domains separately: orientation, attention, memory, verbal fluency, language, and visuospatial abilities. The maximum score is 100 points, and the sum refers to the individual's total score in the ACER. From this total, 30 points refer to the Mini Mental State Examination (MMSE) score. The cut off for the complete battery and MMSE (ACER) were defined as follows: <78 for the complete battery, and <25 for MMSE (ACE-R)[17]. Furthermore, the Memory Complaints Scale (EQM) was used, whose goal is to, systematically, identify memory complaints with a score ranging from 1 to 14 (minimum and maximum)[18]. In addition, the Cognitive Changing Questionnaire 22 (QMC22) was applied as a screening test. The QMC22 is made up of 22 questions that help to differentiate MCI from dementia with a cut off≥ 14[15].

Mood and anxiety data

Beck's Depression Inventory (BDI) was used to evaluate mood as it is a symptomatic scale for depression. In this questionnaire, there are 21 items, with 4 alternatives, whose scores vary from zero to 4 points. The proposed cut-offs are: 0-9 indicates no or few symptoms; 10-18 light symptoms; 19-29 moderate symptoms; and 30-63 severe depression symptoms[19-20]. The screening of anxiety symptoms was obtained by the Beck´s Anxiety Inventory (BAI). The BAI is made up of 21 questions regarding the most common anxiety symptoms and each question has 4 alternatives. The accepted cut-offs are: 0-10 points indicates no or few anxiety symptoms; 11-19 indicates light symptoms; 20-30 indicates moderate symptoms; and 31-63 indicates severe symptoms[19].

Procedures

In total, 28 MCI older adults were referred to the UATI to be included in this study. Participants were invited by a phone call, in which the goal of the study was explained, as well as the invitation to participate. Those who accepted participation in this study (n=28) were asked about sociodemographic and clinical characteristics, as well as the QCM22. These instruments were administered by a trained researcher (R1) from the research group, to guarantee a blind study. After the evaluation, some participants were eliminated due to age (n=1), illiteracy (n=2), or score in the QCM22 (n=1). Subsequently, the research coordinator randomly assigned 24 participants to the groups using the website *randomization.com*. Ultimately, data from 22 participants were analyzed as 2 gave up participation during the interventions. Figure 1 shows the flowchart of MCI participants from this study.
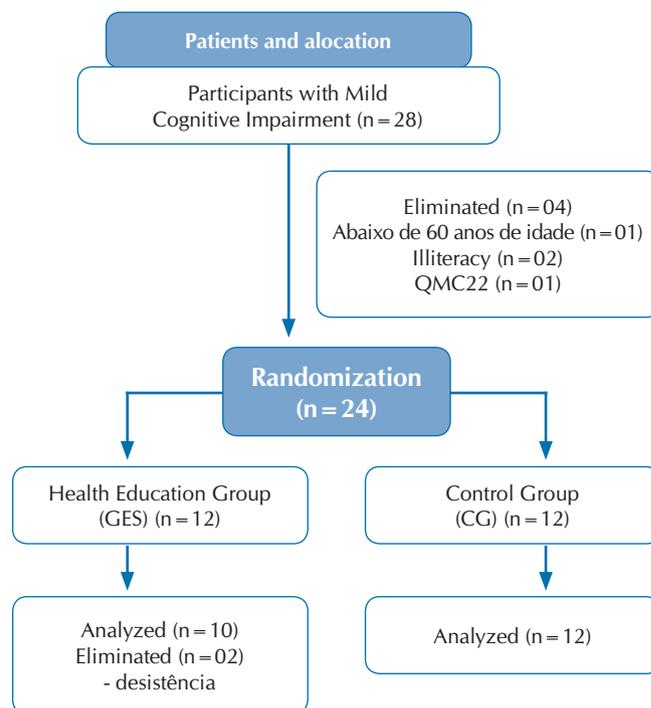

Figure 1 – Flowchart of the participants with Mild Cognitive Impairment (MCI), São Carlos, São Carlos, São Paulo, Brasil, 2016

The research group was made up of two graduate students and three undergraduate students; all of them in the gerontology major. In addition, there was the group advisor, who was the coordinator of the research. All participants were trained to use the protocol, as well as regarding the development of the intervention.

The intervention took place over five months, in the second semester of 2015, and was administrated by a second researcher (R2). The intervention protocol used active strategies of health education from the very first meeting. Participants were required to brainstorm topics in which they had an interest to create a chronogram. By doing this, subjects were expected to actively participate in the group, as well as feel part of the group. For this activity, each participant wrote down two topics that they would like to learn about. From the total of 24 suggested topics, some were excluded as they were the same and some because topics were related. Thus, 10 topics were selected, as represented in Chart 1. The themes were approached weekly, one topic per week. For 20 minutes at the beginning of the meeting participants were allowed to talk in groups in order to exchange their experiences and questions. After that, the researcher gave a presentation related to the proposed theme.

Chart 1 – Description of the activities for the intervention and control groups, São Carlos, São Paulo, Brasil, 2016

Session	HEG	CG
1	**Dynamics 1: Auto-qualification**	
2	Theme 1: Myths and truths about the aging process (dynamics).	Call
3	Dynamics 2: Talent wheel	
4	Theme 2: What is gerontology?	Call
5	Dynamics 3: This reminds me	
6	Theme 3: Cognitive Aging (Memory/ Oblivion/ Alzheimer's)	Call
7	Dynamics 4: Retrospective of the day - Game- "Guess Who"	
8	Theme 4: Exercises for memory	Call
9	Dynamics 5: Street Market	
10	Theme 5:Diabetes/ Hypertension/ Cholesterol	Call
11	Dynamics 6: Walk-dancing	
12	Theme 6: Physical Activity	Call
13	Dynamics 7: Affective Badges	
14	Theme 7: Emotional Health	Call
15	Dynamics 8: Box of Surprises	
16	Theme 8:Hyperthyroidism/ Hypothyroidism	Call
17	Dynamics 9: Electric Current Circle	
18	Theme 9: Musculoskeletal Aging	Call
19	Theme 10: Food: supplementation/ medicines	––
20	Dynamics: Healthy Recipe and coffee break	Participation in the meeting

A week prior to each topic to be approached, a group dynamic [21] was performed. This activity was related to the theme and was thought to promote participants' active participation and to facilitate the conversations, as well as think about the topics in depth, under the reflection-action perspective.

Older adults from the CG did not participate in the interventions. Every two weeks they received a phone call, which lasted around 15 minutes. The purpose of these calls was to ask subjects about their health status, routine, and to learn about the start of any new activities. The researcher responsible for the interventions made the calls and used a questionnaire structured according to the information mentioned above. It is worth mentioning that in the final meeting of the HEG, the CG was invited to join them for a coffee break.

The activities are detailed below:

Auto-qualification

The goals were presentation, identification of the members of the group by their names, integration, as well as stimulation and revealing of personal qualities. All the elderly participants and the graduate student made a badge with their name and a quality written below it. This was performed to facilitate the identification of everyone in the group. This introductive dynamic was used to stimulate affective-verbal expression, group interaction, and self-reinforcement.

Myth or Truth

This activity relies on talking about the myths and truths regarding the aging process. Tags with "MYTH" and "TRUTH" written on them were handed to participants. Next, they were asked to raise the tag according to their opinion regarding the sentence stated by the researcher. The questions were: "Does every older adult have dementia?"; "Are all elderly individuals alike?"; "Can the elderly learn new things?"; "Are all individuals above the age of 60 considered older adults?"; "Are falling events expected as a person ages?"; "Are the elderly, even the illiterate, wise?"; "Are older adults more sensitive to cold weather than other people?"; "Is the loss of muscular mass expected with the aging process?"; "Can the elderly have a relationship?"; and "Can the elderly self-administer medicines?". This activity helped the group in a considerable way as well as promoting group interaction during the first meeting.

Talent Wheel

To bring participants closer, the researcher asked them to make a circle, in which they were supposed to relate, one participant at a time, one of their qualities and talents. The elderly participants indicated that the activity was important to help them to meet the other participants, as well as to interact with them. This topic approached creativity, memory, attention, and language.

This reminds me

The purpose of this activity was to approach the association of ideas in a ludic way, using both the creativity and attention of each participant. The researcher asked the older adults to sit in a circle, and their task was to create a short sentence related to the

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next meeting's topic, as well as their daily routine. For example "I always forget where I put my keys". After saying the sentence, the next participant was supposed to continue a story from the point the previous one stopped. Thus, a story was created based on the topic to be approached. This action was well received by the participants and was good to bring participants together.

Retrospective of the day

The purpose of this dynamic was stimulating memory, language, attention, and logical thinking. The elderly participants were required to describe their previous day. Starting from bedtime, they were asked to remember what they ate, saw, said, who they had talked to, what they had done, and places they had gone, for example.

Street Fair

Some supermarket products were provided and participants were required to point to those which were indicated for healthy eating, and those which were not appropriate for healthy aging. Cognitive domains such as memory, language, visuospatial, verbal fluency, creativity, and executive functions were stimulated.

Walk-dancing

Imbalance, attention, and coordination, as well as executive functions were approached. This activity aimed to enhance movement coordination by means of rhythm changes. Participants were asked to walk to the left and right according to the rhythm of the music.

Affective Badges

The goal of this activity was exchanging affection, as well as promoting approximation, bonding, and relaxation. This dynamic aimed to approach the importance of affective gestures for emotional health. Participants were split into two groups: providing group and receiving group. The latter group turned their backs on the providing group and were handed badges, however they were not allowed to see them. Only the providing group was able to see the badges, which contained the following sentences: "Hug me!", "Kiss me!", "Hold my hand!", "Caress me!", "Ask me how am I!", "Do not do anything to me!". Every individual in the receiving group was given affection as instructed on the badge, so only one person did not receive any affection and this was used to elucidate the topic emotional health, which was approached in the next meeting.

Electric Current Circle

This activity stimulated attention, contact, imbalance, group interaction, and executive function. Participants were asked to stand up and make a circle holding hands. They were required to raise the correct hands according to the commands and to continue doing this as if an electric current was passing by. The command was something like: "Starting from 'Maria', raise your right hand". After a while, the command was changed to something like "Starting from 'João', raise your left hand". This activity corroborated in relaxation and interaction among the group.

Healthy Recipe and coffee break

On this day, a healthy coffee break was offered to the participants; carrot cake, pineapple juice, bread without gluten, tuna salad, coffee, and mint tea.

Statistics

Statistical analyzes were performed with specific programs, such as SPSS®, 20.0 version for Windows®. Means and standard deviations, as well as proportions or percentiles were used for the descriptive statistics. Continuous variables (age and schooling) were analyzed using one-way ANOVA, and categorical variables (sex, marital status, and occupation) were analyzed with the Fischer test to compare the groups (CG and HEG). The hypothesis was tested bi-caudally and results were statistically relevant when $p < 0.05$. For the comparison of the variables (cognition and mood) between pre and post intervention, the t test for paired samples was used. Once again, statistically relevant results were those with $p < 0.05$. Variables were considered parametric given the normality of the sample.

RESULTS

The majority of the participants were female for both groups (HEG = 70%; CG = 75%), married (HEG = 80%; CG = 58.3%), with a mean age of 68 and 77 years for the HEG and CG, respectively. In addition, the majority of participants were retired (HEG = 100%; CG = 91.7%) and were assigned to B2 for their economic level. There were similarities between the groups for the variables schooling, sex, and occupation. Only age and marital status were different. The Sociodemographic profile for the participants is shown in Table 1.

Table 2 shows the health characteristics of the sample. The mean number of diagnosed diseases was 3 (± 1.24) and 3.14 (± 2.39), and the mean number of medicines in use was 2.5 (± 1.08) and 3.83 (± 2.20), for the HEG and CG, respectively. Regarding smoking, the majority of participants did not have this habit and regarding the Body Mass Index (BMI), the HEG presented normality with 23.88 (± 4.40), while the CG indicated obesity 28.11 (± 3.94). The participants were, generally, active for physical activity: 70% of the HEG and 41.66% of the CG practiced a physical activity at least three times a week.

Mood, memory complaint, and sociodemographic and heath characteristics were analyzed regarding their distribution. In addition, the first two variables mentioned above were compared between pre and post test.

The HEG demonstrated a relevant improvement in attention/orientation from 15.5 ± 1.9 points to 17.0 ± 1.24 points ($p = 0.026$); memory from 15.4 ± 4.2 points to 20.7 ± 3.7 ($p = 0.001$); language from 21.7 ± 2.9 points to 23.8 ± 3.3 ($p = 0.033$) points; and general ACE-R score from 71.3 ± 8.4 to 82.2 ± 8.1 ($p = 0.003$) points. For memory complaint, anxiety, and depressive symptoms, as well as for other cognitive domains such as visuospatial and verbal fluency, even though participants presented an improvement, it was not statistically relevant.

Regarding the CG, an improvement was observed in the scores of all instruments; however, the improvements were not statistically relevant.

Table 1 – Sociodemographic profile for the Health Education Group (HEG) and Control Group (CG), São Carlos, São Paulo, Brazil, 2016

| Variables | Group | | p value |
	HEG (n = 10)	CG (n = 12)	
Mean age ± standard deviation	68 ± 6.05	77.3 ± 6.31	0.001*
Schooling (years)	4.9 ± 3.34	7 ± 4.53	0.456*
Sex			0.090**
Female n (%)	7 (70%)	9 (75%)	
Male n (%)	3 (30%)	3 (25%)	
Marital Status n (%)			0.004**
Married	8 (80%)	7 (58.3%)	
Widowed	2 (20%)	2 (16.7%)	
Separated	0	2 (16.7%)	
Single	0	1 (8.3%)	
Occupation			0.189**
Active n (%)	0 (%)	1 (8.3%)	
Retired n (%)	10 (100%)	11 (91.7%)	

Note: *one-way ANOVA; ** Fischer Test

Table 2 – Health profile for the Health Education Group (HEG) and Control Group (CG), São Carlos, São Paulo, Brazil, 2017

| Variables | Group | | p value |
	HEG (n = 10)	CG (n = 12)	
Diagnosed Diseases	3 (± 1.24)	3.14 (± 2.39)	0.223*
Medicines	2.5 (± 1.08)	3.83 (± 2.20)	0.045*
Smoking			0.434**
Yes n (%)	1 (10%)	0 (0%)	
No n (%)	9 (90%)	10 (100%)	
BMI	23.88 (± 4.40)	28.11 (± 3.94)	0.154*
Physical Activity			0.006**
Yes n (%)	7 (70%)	5 (41.66%)	
No n (%)	3 (30%)	7 (58.33%)	

Note: *one-way ANOVA; ** Fischer Test

Table 3 – Cognitive profile of the Health Education Group (HEG) and control group (CG), São Carlos, São Paulo, Brazil, 2017

| Variables mean ± standard deviation | HEG | | p value | CG | | p value |
	Pre-intervention	Post- intervention		Pre-intervention	Post- intervention	
EQM	5.5 ± 3.0	4.9 ± 2.6	0.425	6.9 ± 2.6	7.0 ± 3.3	0.874
BDI	5.8 ± 2.8	4.8 ± 2.3	0.502	8.5 ± 3.9	9.0 ± 4.8	0.790
BAI	4.6 ± 4.2	3.0 ± 1.8	0.172	9.0 ± 7.7	9.0 ± 5.6	0.969
Attention/Orientation	15.5 ± 1.9	17.0 ± 1.24	0.026	14.8 ± 2.4	14. 2 ± 1.9	0.294
Memory	15.4 ± 4.2	20.7 ± 3.7	0.001	13.3 ± 5.3	15.3 ± 5.3	0.145
Verbal Fluency	6.9 ± 3.5	6.4 ± 3.5	0.591	7.0 ± 2.4	8.3 ± 3.0	0.226
Language	21.7 ± 2.9	23.8 ± 3.3	0.033	19.5 ± 2.9	21.3 ± 2.2	0.085
Visuospatial	12.8 ± 2.6	14.3 ± 1.7	0.181	12.5 ± 2.4	12.3 ± 2.8	0.761
ACE-R	71.3 ± 8.4	82.2 ± 8.1	0.003	67.0 ± 6.6	71.9 ± 7.2	0.052
MMSE (ACE-R)	25.8 ± 2.0	27.2 ± 1.8	0.050	23.0 ± 3.0	23.5 ± 3.0	0.555

Note: t test for paired samples; EQM (Memory Complaints Scale); BDI (Beck's Depression Inventory); BAI (Beck's Anxiety Inventory); ACE-R (Addenbrooke's Cognitive Examination-Revised); and MMSE (Mini Mental State Examination).

DISCUSSION

In the present study, we analyzed the effects of health education on cognition and anxiety and depressive symptoms in the elderly with MCI. It was identified that the majority of the participants were women, retired, married, and with schooling above the national average, which is 3.4 years[22]. A possible explanation for the predominance of female participants relies on the fact that this gender group is more likely to participate in groups for senior citizens and men and women have different perceptions regarding the aging process. In addition, according to research, men are more interested in political topics, and women are more involved in connivance groups[23]. Subjects participated in an intervention group inside an open university for seniors, whose participant profiles are women, younger elderly (between 60 and 75 years old), married, with higher educational status and income, corroborating with studies that describe the participants of such programs[23-24].

Regarding the health profile, it was observed that each subject had a mean of three diagnosed diseases, and took, on average, between two and three medicines per day, which follows the pattern of another national study[25]. The authors of this study carried out therapeutic meetings for the elderly with initial stages of dementia. This group performed orientation and cognitive stimulation activities for three months, and it was possible to observe that participants presented other associated illnesses, such as hypertension, and took more than three medicines daily.

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Such characteristics are in accordance with the epidemiological transaction process, which is represented by the increase in the number of elderly individuals with chronic diseases, and the existence of comorbidities, with three or more associated diseases, more frequently among women[1].

A non-smoking profile as well as physical activity practice was more common among participants of the HEG. It is possible to elucidate that, due to the schooling characteristic (more than 4 years of education), these individuals could have had more access to health services and, consequently, present better physical health and a healthier lifestyle, which can also be found in the literature[13,26]. It is known that individuals who practice physical activity present better cognitive status than sedentary people[27]. This information supports the findings observed regarding participants' cognitive performance (ACE-R and MMSE), and the HEG demonstrated better performances both pre and post intervention when compared with the CG. This result suggests the importance of stimulating physical activities among the elderly population as a strategy to promote physical and mental health[27].

The health education intervention corroborated with improvement in participants' memory; a pattern also observed in the literature[13,25-26]. Our findings suggest that HE provides good dynamic based cognitive stimulation and is efficient to improve cognitive performance. In addition, the results of the present study support the hypothesis that older adults who are socially engaged with good health habits present a good perception of memory performance, as well as understanding the importance of cognitive working[13]. Since cognitive decline is somehow expected during the aging process, it is important for the elderly to continue training their cognitive domains in order to minimize losses, even though some genetic factors contribute to differences among individuals[28].

Memory is one of the most important cognitive domains as it is fundamental for the teaching-learning process and for one's self perception of identity. Without memory, it would be impossible to acquire and share experiences from and to others, which contributes to the socialization of human beings, highlighting the importance of stimulating this cognitive domain[25].

Not only global cognition should be measured by screening tests for dementia identification. Indeed, cognitive domains such as visuospatial perception, memory, attention, information processing, reasoning, and the capacity to solve problems also need to be considered[29]. Regarding language, it is known that this domain is affected by educational level. When someone is performing a task that requires good language ability, those who have a low educational level need more time, make more mistakes, and reach fewer targets than individuals with higher schooling[29]. In this study, participants showed an important improvement in the language domain, which could be associated with the fact that the majority of participants had more years of education and consequently a greater facility for learning.

In addition to language, orientation also presented a significant improvement in this study. This was also found in a study that aimed to analyze the effects of cognitive stimulation with orientation among the elderly with Alzheimer's disease in the initial stages[13]. The authors reported that, actually, orientation ability was not lost, although it was less used. After the stimulation with a calendar and a watch, as well as advice given to the caregivers about the importance of maintaining temporal orientation in the elderly, the participants showed an improvement in this domain. This stimulation was also observed in the present study, in which participants needed to remember the place, date, and hour of the meeting. At the same time, some topics regarding cognitive stimulation were approached aiming to preserve participants from cognitive loss.

Cognitive performance, represented by the scores in the ACE-R and MMSE, improved, which can also be observed in other studies[13,25,28]. The proposed time in the present study seems to be enough to perceive the stabilization and improvement in participants' cognitive ability. This is important for MCI patients due to the possibility of conversion to Alzheimer's disease, which is around 10-15%[3].

The method of HE most similar to the one used in the present study was also used in a Brazilian sample. In this other method, memory and the aging process were approached for 8 sessions. These topics were discussed using newspapers and magazines, with reading and discussing in small groups. Even though participants did not practice strategies for memory or other cognitive abilities, global cognition also improved[30].

The literature suggests the need to establish learning strategies including dialogues, giving value to knowledge exchange, aiming to promote health at both an individual and collective level[31]. In the field of gerontology there are many arguments in favor of education, and promotion of integration and participation of the elderly in social life. Among these arguments, it is possible to mention new learning acquired by means of HE that impacts on functionality, flexibility, preservation and improvement of cognitive performance, quality of life, and the possibility of adaptation of the elderly[32]. These characteristics are related to successful aging. It is thought that these educational opportunities are important for older adults since it is believed that they enhance social interactions and exchange of experience and knowledge, as well as personal improvement.

Participants in the HE group in the present study demonstrated interest in the meetings as they realized the possibility of learning new things and sharing information. The orientation and information acquired in the group helped participants to grow and change. In addition, the social interactions became part of their lives, which contributed to the feeling of engagement and satisfaction. As a result, participants presented reduced depressive symptoms.

It is important to mention that this HE had a group with similar characteristics, for example age, marital status, or health issues. This method is commonly used to develop educational processes in health facilities[33].

Regarding depressive and anxiety symptoms, there was no statistically relevant improvement in these variables, even though participants referred to them. No studies were found that analyzed the effects of HE on mood of the elderly. However, there is some literature that evaluated depressive and anxiety symptoms in the elderly with MCI after cognitive training in addition to HE and the results suggested improvement in mood[34-35].

Although HE was carried out in some studies, no references were found that contained the same number of interventions,

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the same proposed method, and the same protocol as the present study. A recent study performed in Singapore used HE and evaluated its effect on lifestyle, nutrition, and cognitive functioning of older adults with MCI. The authors concluded that this type of intervention, which took place monthly for a year, resulted in an improvement in all studied variables[13].

The improvement in MCI facilitated by HEG can be supported by the previously discussed arguments; however, it is important to mention that it is difficult to establish an MCI diagnosis, as there are a large number of situations that can influence low cognitive performance in the elderly. Some examples of this are polypharmacy, depression, and non-treated systemic diseases (hypertension, diabetes, pulmonary issues, cardiopathy, and hypothyroidism). On the other hand, when the causes are identified and treated correctly, it leads to stabilization or even the reverse of the condition[14].This could be a limitation of the present study as health variables were not controlled for the sample, which may have interfered in our findings.

HE is a tool used in the process of awareness about responsibility, both individual and collective, and access to good health[36]. Implementing adequate and systematic interventions with pre and post-evaluation, and comparing with a control group, allows better understanding of the real impact on the participants' health. In addition, it elicits the possibility of having a group well trained in the field of gerontology. The national policy for the health of the elderly recognizes the importance of the integral care for older adults. In addition, it states that health promotion, prevention of incapacities, and maintenance of cognitive performance should be facilitated for adults and senior citizens[37].

Limitations of the study

Some limitations of this study were the small sample size, since few older adults had a decisive diagnosis of MCI; the lack of paired groups (age, marital status, physical activity, and medicine usage), which makes it difficult to analyze the data as these factors may interact with other conditions and alter the results. Finally, studies that use HE interventions are sparse in the literature, and the specific methods used in the interventions were not mentioned in other studies, which make it more difficult to discuss and compare the results.

Contribution the area of nursing and public health

The present study shows the importance of non-pharmacological treatments for the elderly population, especially due to the presence of polypharmacy among this group. It is worth mentioning that HE is a multidisciplinary intervention, which can be conducted by different health professionals. This could increase the integration in the group. The applicability of an HE intervention is positive, as it improves the cognitive status of MCI patients. Thus, continuing research regarding this topic is important for nurses as well as for other health professionals.

CONCLUSIONS

The results of this study suggest that a health education intervention based on active strategies and group dynamics has a beneficial effect on improvement in cognitive functions, especially memory, language, and orientation. The limitations of this study should be overcome in future research. Some suggestions are including a larger sample with this methodological approach, thinking about the possibility of paring the groups according to the sociodemographic as well as transferring the strategies to participants' daily life.

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