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To cite this article: Natalie Pereira, Renata Kochhann, Gabriela Peretti Wagner & Rochele Paz Fonseca (2021) Development and content validity of the CENEES program - psychoeducation for health staff on neuropsychology of aging, *Aging & Mental Health*, 25:2, 386-396, DOI: [10.1080/13607863.2019.1693975](https://doi.org/10.1080/13607863.2019.1693975)

To link to this article: <https://doi.org/10.1080/13607863.2019.1693975>



Published online: 03 Dec 2019.



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## Development and content validity of the CENEES program - psychoeducation for health staff on neuropsychology of aging

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### ABSTRACT

Worldwide life expectancy has increased dramatically in recent years. Also on the rise are incidents of pathologies related to aging, such as Mild Cognitive Impairment (MCI) or Alzheimer's Disease (AD). An inaccurate diagnosis impairs the well-being and the quality of life of patients and their relatives, as well as being a financial burden on the health system. Continued education pertaining to the neuropsychological field is uncommon for health workers involved in general practice. This article aims to present the process of development and content validity of the "CENEES Program - Psychoeducation for Health Staff on The Neuropsychology of Aging". The CENEES Program was developed in six steps which include: literature review, first draft, focal group, adjustments after focal group, judgment analysis ( $n=4$ ), and finally the last version. The inter-rater reliability index after judgment analysis was 0.785. The final version of the CENEES Program contains eight meetings, divided into 4 modules: 1) Fundamentals of Neuroscience; 2) Memory; 3) Executive Functions; and 4) Communication. The final meeting was called "Review". The CENEES Program is a new resource to help professionals who work within the general practice field, especially community health workers. As far as we know, there is no psychoeducation program on aging which contains the four subjects that are covered in the CENEES Program. The CENEES Program could assist the workers' daily activities and make them comfortable to offer and build actions in the community. A pilot and follow-up studies are suggested.

### ARTICLE HISTORY

Received 18 July 2019  
Accepted 9 November 2019

### KEYWORDS

Psychoeducation program; neuropsychology; mild cognitive impairment; Alzheimer's disease; aging

### Introduction

Aging is an important developmental phase that people go through in life. This particular topic has been studied by scholars for many years because it can severely impact people's lives and their families as well. Due to the extended life expectancy rate that is present now, we have elderly people that are susceptible to diseases during the aging process. Europe is expecting the number of patients with dementia to surpass 14 million in 2050. In 2010, the same continent had cases of dementia reaching 2.6% of the active taxpaying population. Furthermore, it is expected that by 2050, it will reach 6.2% (Mura, Dartigues, & Berr, 2010; World Health Organization, 2018)

The World Health Organization created seven actions and goals during 2017–2025 (World Health Organization [WHO], 2018). The actions are as follow: First action, talks about dementia as a public health priority: by 2025 it is expected to reach 75% of the countries within politics, strategies and actions plans to intervention regarding dementia. Second, is made specifically to bring awareness to dementia and dementia friendliness: by 2025, 100% of countries need to have developed public awareness campaigns pertaining to dementia and also 50% of countries have to have at least one initiative favorable to prevention within dementia.

The third action is about reducing the risk of dementia and also the risk of noncommunicable diseases. The fourth

goal is made up of the dementia diagnosis, treatment, care and support. By 2025 they want to reach 50% of people diagnosed in a minimum of 50% of countries. The fifth action is in relation to the family members of those with dementia and their professional caregivers. By 2025, 75% of countries want to provide support to caregivers and relatives. The sixth is in regard to the information systems for dementia: by 2025, 50% of countries should collect data daily on dementia. Finally, the last action is on dementia research and innovation: to multiply research regarding dementia during the period of 2017–2025 (World Health Organization [WHO], 2018).

In addition, the number of misdiagnosed dementia is at an all-time high, even in counties with high-income rates. An alarming reality for developing countries like Brazil is that the misdiagnosis increased by 41.6% in people that are 60 years of age between 2000 and 2010. Around 1 million patients were diagnosed with dementia during that period. Despite the effort to enrich the process of diagnosing patients earlier, it is expected that 77% of dementia patients never had the opportunity to receive a correct diagnosis in Brazil (Herrera, Caramelli, Silveira, & Nitrini, 2002; Nakamura, Opaleye, Tani, & Ferri, 2015).

Previously, in São Paulo-Brazil, Sczufca et al. (2008) identified around 5.1% of patients who would meet the specified criteria for dementia. However, they did not receive the diagnosis at the expected time. Unfortunately,

many patients received treatment at a later date and they sometimes spent their life without the proper diagnosis, worsening their own quality of life and also of their families and caregivers. Regardless, if they were in the chronic or severe stages of dementia, it was the same (Scazufca et al., 2008; Sternberg, Wolfson, & Baumgarten, 2000).

Given this epidemiological data, a huge effort has been pushed forward for the development and investment of preventive measures on dementia. These actions aimed to spread the knowledge of dementia and to contribute to an advanced early diagnosis (World Health Organization, 2015a). Therefore, professionals could identify signs of a typical stage of aging, while also decreasing barriers of pathological situations. These improvements could have provided a better quality of life for the patients.

A successful example of these actions is presented by France. They adopted a dementia plan that has been used as a reference since 1999. In regards to the "Alzheimer Europe" during 2016–2020, the stipulations presented are: (1) providing a voice to people with dementia and their care; (2) Making dementia a European priority; (3) Promoting a rights-based approach to dementia; (4) Supporting dementia research and (5) Strengthening the European dementia movement (<https://www.alzheimer-europe.org/Alzheimer-Europe/Our-work/Strategic-Plan-2016-2020>, recovery in november 2018).

As far as we know Brazil does not have a structured dementia plan in relation to Mild Cognitive Impairment (MCI) and Alzheimer's Disease (AD). We found a publication referring to the essential steps Brazil must commit to in order to implement strategies. These said strategies were suggested to be used as a reference for worldwide care in relation to dementia patients (Engedal & Laks, 2016). Further work developed by "Bupa" and "Alzheimer's Disease International" is a guideline that was translated from English to Portuguese regarding the planning on dementia, specifically about the actions. The authors included relevant knowledge in regards to dementia and what actions need to be taken in the next years (Pot & Petrea, 2013).

For Brazil's realities, there are professionals called community health workers. Their work is essential to the integration of primary health care and community services. There are more than two thousand community health workers that work directly with actions to promote health. Also, the Ministry of Health of Brazil stimulates these professionals to receive qualification (Brasil, 2009). The role of these workers is fundamental to the success of any strategy while their job includes orientation, screening/tracking, follow-up, monthly meetings and registration of patients' health data (Costa et al., 2016).

Despite this reality, it is true that Brazil makes efforts to advance public policies as a whole, providing access to primary care services (BRASIL. Ministério da Saúde 2009). However, nowadays it remains difficult to take actions to endorse the process of implementing educational programs rather than provide medications and stimulate the polypharmacy, for example (Mair et al., 2017; World Health Organization, 2019b). International organizations provided the educational materials needed for there to be education on this disease in Brazil, but the language barrier became a problem. The materials that ended up being provided were in English, which in turn makes it difficult to promote said education for the people who speak

Portuguese (<https://www.alzheimer-europe.org/Alzheimer-Europe/Our-work/Strategic-Plan-2016-2020>, recovery in november 2018) (National Institute on Aging, 2015, 2016).

Unfortunately, continued education pertaining to the neuropsychological field is uncommon for health workers. This occurs in the medical field practicing medicine, and also with those who are outside this practice field. It is perceived that they are not properly educated when it comes to MCI and AD cases in the communities. The knowledge that is present for them is sometimes lacking in the support that patients need. In order to develop the CENEES Program, we explored the literature. As a result, we did not find any programs that helped to promote the education of health staff that was connected to cases involving neuroscience, memory, executive functions and/or communication.

However, we found materials that promoted the educational development of professionals by institutions, such as: (1) The eight basic steps that support patients with dementia developed by "Skills for health" ([www.skillsforhealth.org.uk](http://www.skillsforhealth.org.uk)) (Skills for Care & Skills for Health, 2011); (2) The guide by the name of "Talking With Your Older Patient A clinician's Handbook", developed by National Institute on Aging (National Institute on Aging, 2016); (3) The "Staff Training in Assisted Living Residences – STAR" (Linda, Huda, Gibbons, Young, & Leynseele, 2005) made for health teams; (4) The RECAPS and MESSAGE (Broughton et al., 2011) training for home care organizations, and (5) The *Training modules to foster communication skills in geriatric caregivers attending to the needs of dementia patients* TANDEM (Franzmann, Haberstroh, & Pantel, 2016).

These programs were an essential key related to dementia worldwide. They share some common relations as in how they talk about what dementia is, what the symptoms are and how the pharmacological treatment works. Some of them speak on the communicational factors with patients that could have yielded a negative review from the treatment when carried out improperly (such as mental stress, burnout, challenging behavior or resistiveness to care, and the overuse of elderspeak). Some of the designated programs refer to the increase in the quality of life from patients, caregivers, professionals, and family (Beer, Hutchinson, & Skala-Cordes, 2012; Broughton et al., 2011; Cardoso et al., 2011; Franzmann et al., 2016; Haberstroh, Neumeyer, Krause, Franzmann, & Pantel, 2011; Horgas, Yoon, Nichols, & Marsiske, 2008; Kuske et al., 2009; Linda et al., 2005; Lingler et al., 2016; National Institute on Aging, 2016; Santos et al., 2015; Serelli et al., 2016; Skills for Care & Skills for Health, 2011; Williams, Kemper, & Hummert, 2004; Williams, Perkhounkova, Herman, & Bossen, 2016).

Despite these programs mentioned, it is still perceived in the literature that there is a gap regarding psychoeducation of MCI and AD, especially in continuing education of community health workers involved in general practice. These professionals have a connection on a daily basis with the community (BRASIL. Ministério da Saúde 2009; Marques, 2014). To increase the quality of life, the rates of early detection are essential for the identification of change in cognition (Barnett, Lewis, Blackwell, & Taylor, 2014; de Vugt & Verhey, 2013; Robinson, Tang, & Taylor, 2015).

This is necessary to help reach a quicker diagnosis for patients. During this process, it is not entirely enough that patients are perceived to be aware of the struggles they

are facing (Sousa et al., 2015). Professionals need to be prepared to offer an understanding of the aging process within the disease, while also providing an understanding of what was expected for “normal” aging and age-related diseases. In addition, they are also to follow the patient’s symptoms to offer guidance and reference if possible. Only then would they help in premature and precise disease detection (Fernandes et al., 2010).

After all, this article is aimed to present the process of the development pertaining to the “CENEES Program - Psychoeducation for Health Staff on Neuropsychology of Aging”. The abbreviation of CENEES Program is to maintain the reference of the Brazilian version. The name of the program in Brazilian Portuguese is “Programa de Capacitação em Neuropsicologia do Envelhecimento para Equipes de Saúde (CENEES)”. We created this resource to empower Brazilian health staff within the dementia community and to translate concepts that could otherwise be perceived as unapproachable in the neuropsychological field. In addition, this article sought to present content validity of the CENEES Program.

## Method

### Ethical and data collection procedure

Participation was voluntary and without financial compensation. All participants signed an informed consent form before study entry. The CENEES Program was developed in six steps: Step 1: The literature review: provided theoretical reference to support this study. We searched for existing materials about dementia and neuropsychology in reference to aging, which was prepared from health professionals interested in this topic; Step 2: The first draft of the CENEES Program was completed; Step 3: The focal group;

Step 4: The adjustments to the program after the focal group; Step 5: The judgment analysis; and Step 6: The second round of the CENEES Program revisions before judgments concerns (Figure 1). Furthermore, in the future, the CENEES Program would be implemented as a pilot study (Pereira et al, in press).

Step 1 - The literature review: A non-systematic literature review was conducted in several empirical national and international publications, as well as technical websites. Four main key resources were consulted: National Institute on Aging (<https://www.nia.nih.gov/>); Alzheimer’s Association (<https://www.alz.org/>); World Health Organization (<http://www.who.int/>); Brazilian Alzheimer’s Association (<http://abraz.org.br/web/>). Moreover, around 130 articles were discovered and discussed within the scope of psychoeducation programs.

Step 2 - The first draft of the CENEES Program: After Step 1, we implemented the first draft from the CENEES Program (guidebook and folder). It was developed with the understanding that the vast majority of health professionals do not have this background in their professional qualification. Thereby, after the CENEES staff meeting we intend to have at least 4 modules divided into a systematic macro and microstructure.

Step 3 - The Focal Group: The Focal Group aimed to identify the general practice team’s background knowledge regarding aging, neuroscience, and cognition (specifically from community health workers). It was conducted through a group conversation with open-ended questions. These open-ended questions were looking at understanding doubts, uncertainties and/or beliefs about the subjects that would be explored in the CENEES Program.

The focal group was regulated in under a three-hour session and was conducted in one day in a quiet room at

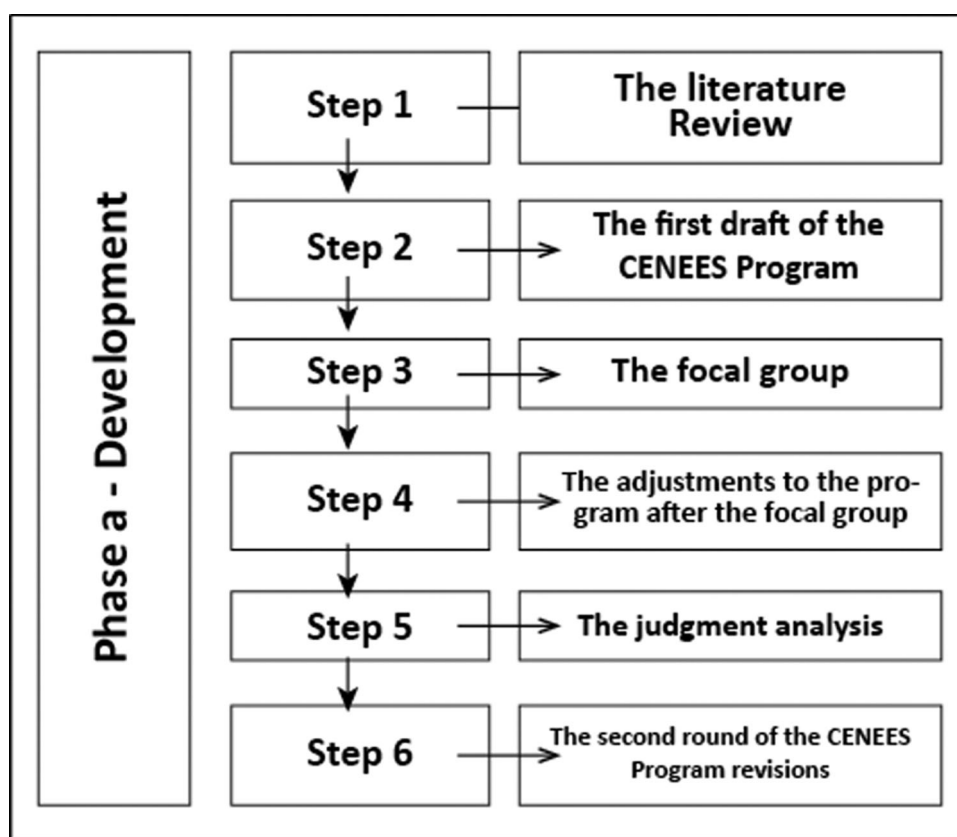


Figure 1. Methodological steps for development of the CENEES program.

the Basic Health Unit with participants. Prior to that there was a structured questionnaire that was available. There was also a room for the participants to have a free-talk of such that was conducted collectively. Within this collaboration, there were questions that explored what their routines were, and what their obligations may be. Lastly, we queried them about specific concepts explored in the CENEES Program and these questions were our baseline evaluation. The focal group sample is shown in Table 1.

Step 4 - The adjustments to the program after the focal group: A few changes were made after the focal group.

Step 5 - The judgment analysis: We used a blinded inter-rater reliability analysis to evaluate the CENEES Program. We invited 4 judges with expertise in neuropsychology whose background education is shown in Table 3. Each meeting was had independently with the judges for 2 hours. The judgment analysis was recorded for future review and each suggestion made by the professionals was made in independent files.

Thus, each module had six versions: the first draft ( $n = 1$ ), the version of each judge ( $n = 4$ ), and the final version after judgment analysis ( $n = 1$ ). The raters did not have access to each other's suggestions. They analyzed the whole CENEES Program by answering questions while using a Likert scale of five-points such as: Strongly disagree (1 point); Disagree (2 points) Neutral (3 points); Agree (4 points) and Strongly Agree (5 points).

Step 6 - The second round of the CENEES Program revisions: After raters' suggestions, we managed a final meeting with the authors to conclude the CENEES Program.

**Table 1.** Sociodemographic characteristics of general practice team on focal group.

Variables	Mean (range)	DP
Age	39,18 (23–55)	9,95
Years of formal education	13,36 (8–21)	4,08
Reading habits	15,27 (10–22)	3,95
Writing habits	15,82 (7–24)	5,84

Note: The general practice team were all professionals from the Basic Health Unit, such as community health workers, a nurse, a nursing technician, and a general practitioner physician.

**Table 2.** Content analysis of focal group responses.

Question	Main presented ideas
How are referrals made?	(1) The idea that it is just when something severe happens then a referral is made to a medical specialist. (2) The idea that it is not clear how referrals are made. (3) The idea that the Community health workers are who advise people to look for a doctor if they perceived any changes. This is made for any type of pathology and does not have a specific protocol to follow.
How do you see the need of elderly patients to make an appointment for this specific demand (Alzheimer's Disease, Mild Cognitive Impairment)?	(1) The idea that it is two main situations, the first one when patients do not show concern about aging at all, and the second one when they are overly concerned. (2) The idea that it is normal to forget things during aging. (3) The idea that it is only a concern when the family's patients were previously diagnosed with dementia. (4) The idea of wrong concepts appears here. (5) The idea of people having a lot of doubts about dementia and when to search for help.
What do you think are people's greatest needs in this regard?	(1) The idea of not being aware of needs because of lack of knowledge.
What are your biggest needs as a team regarding this specific field?	(1) The idea of understanding better the initial symptoms and also what to pay attention to refer for a doctor appointment. (2) The idea of understanding what kind of intervention could be done initially. (3) The idea of doing actions to work with prevention and early diagnosis.
What do you think you know about dementia and Alzheimer Disease? Do you think that there are some aspects which block working better in this field?	(1) The idea of having received just one psychoeducation moment in the entire time of work, for one hour. (2) The idea of comparing patients' clinical symptoms with people who were previously diagnosed. To identify if the impairments are closer if associated with other patients.

## Participants

### CENEES program staff participants

The CENEES Program (Steps 1-6) was developed by two ( $n = 2$ ) neuropsychology professionals. Moreover, the raters' samples that were involved in Step 5 of the CENEES Program were also in relation to the four judges ( $n = 4$ ). Furthermore, the work related to the raters was shown in Table 2.

### Focal group participants

Once we arrived at "Step 3" the sample of the focal group was comprised of ten participants ( $n = 10$ ), it is when all the professionals from the Basic Health Unit in a small city of Southern Brazil were invited. The sample was composed of eight community health workers ( $n = 8$ ); one nurse ( $n = 1$ ); one nursing technician ( $n = 1$ ); one general practitioner physician from "Mais médicos para o Brasil" Program ( $n = 1$ ). A description of the sociodemographic characteristics of the sample is presented on Table 1.

### Statistical analysis

After the judgment analysis, the data was compiled and analyzed using SPSS Statistics version 20.0. An Intraclass Correlation Coefficient was used to identify the judgment reliability. A score of less than 0.5 is assumed weak; between 0.5 and 0.75 is considered moderate; between 0.75 and 0.95 is assumed good and above 0.95 is regarded as excellent reliability (Koo & Li, 2016).

## Results

Step 1 - The literature review: Four key resources were consulted: National Institute on Aging (<https://www.nia.nih.gov/>); Alzheimer's Association (<https://www.alz.org/>); World Health Organization (<http://www.who.int/>); Brazilian Alzheimer's Association (<http://abraz.org.br/web/>). Moreover, around 130 articles were discovered and discussed within the scope of psychoeducation programs.

We reviewed and extracted how concepts such as neuroscience, memory, executive functions, and communication are



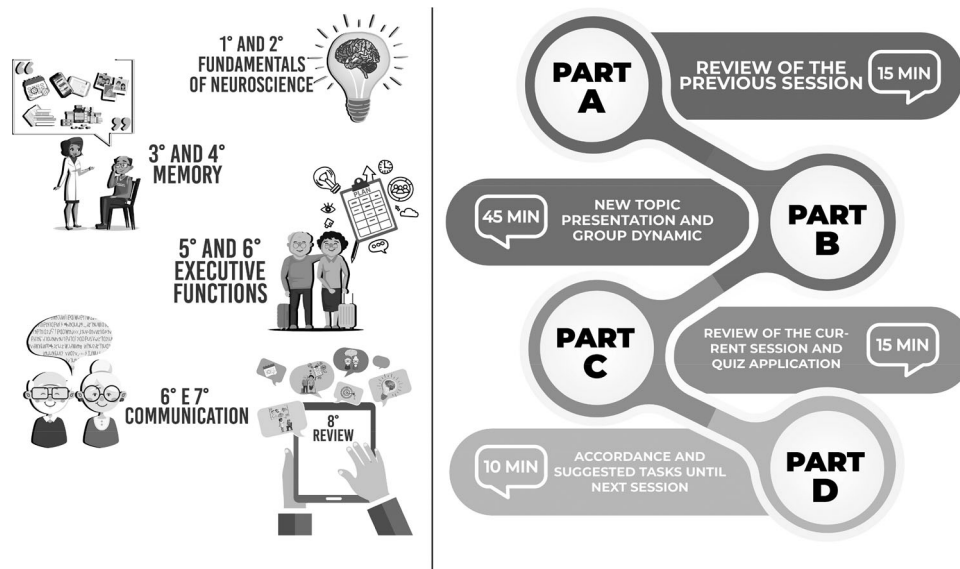


Figure 1. Macro and microstructure of CENEES program.

Table 3. Judge's profile involved on all steps of CENEES Program.

Step	Number of professionals involved	Time of experience working with neuropsychology	Publications
Step 1- The Literature Review	n = 1 <sup>a</sup>	<sup>a</sup> 8 years; PhD	22
Step 2 – The first draft of CENEES Program	n = 2 <sup>a,b</sup>	<sup>a</sup> 8 years PhD <sup>b</sup> 19 years Post-PhD	345
Step 5 – Judgment analysis	n = 4 – <sup>c,d,e,f</sup>	<sup>c</sup> 8 years; PhD <sup>d</sup> 10 years; Post-PhD <sup>e</sup> 15 years; Post-PhD <sup>f</sup> 8 years; Master	452 56 32 18
Step 6 – The second round of CENEES Program revisions	n = 2 <sup>a</sup>	<sup>a</sup> 8 years; PhD <sup>b</sup> 19 years; Post-PhD	

Note. The authors and judges are identified by letters “a” to “f”. They are professors from Federal and Private Universities from Brazil. They are psychologists (n = 5), speech and language pathologist (n = 1), and they all are specialized in neuropsychology.

Table 4. Judge's scores and intraclass correlation analysis.

Module	Judges total scores of each module				Intraclass correlation coefficient*
	Judge 1	Judge 2	Judge 3	Judge 4	
Fundamentals of neuroscience (maximum score/251)	212	225	234	224	0.785
Memory (maximum score 236)	207	225	225	210.3	
Executive functions (maximum score 221)	181	203	221	213	
Communication (maximum score 221)	203	179	213	186	

\*Cronbach's alpha analysis. A score of less than 0.5 is assumed weak; between 0.5 and 0.75 is considered moderate; between 0.75 and 0.95 is assumed as good and above 0.95 is regarded as excellent reliability (Koo & Li, 2016).

presented in the referenced articles. Also, videos, audios, photos, blogs, and articles were selected from our non-systematic review. This whole process was conducted to help to create the resources needed for a better understanding by the professionals who work in primary care services.

Step 2 – The first draft of the CENEES Program: the first draft of the CENEES Program was composed within a folder regarding memory and a guidebook with 4 modules, called: 1) Fundamentals of Neuroscience, 2) Memory, 3) Executive Functions and 4) Communication. The first and second modules were divided into two sessions, while the third and fourth were conducted within a session and a half each. Besides that, we suggested one last meeting which was referred to as the “Review” session. Each session had the following macro and microstructure followed by sub focuses within the session. (Figure 1):

Step 3 – The Focal Group

A qualitative content analysis process was gathered from the questions we created and the answers we received. These results are displayed in Table 2.

A qualitative content analysis process was gathered from the questions we created and the answers we received. These results are displayed in Table 2.

Step 4 – The adjustments to the program after the focal group: All said changes are in Appendix 1. Several modifications in the CENEES guidebook were necessary. Specifically, we made substantial changes within the first module, as can be seen in Appendix 1.

Step 5 – The judgment analysis: The judge's profile and the modules' reliability index are in Table 3. The analysis of the intraclass correlation coefficient was 0.785 (Table 4), which is regarded as a satisfactory reliability for this study (Koo & Li, 2016).

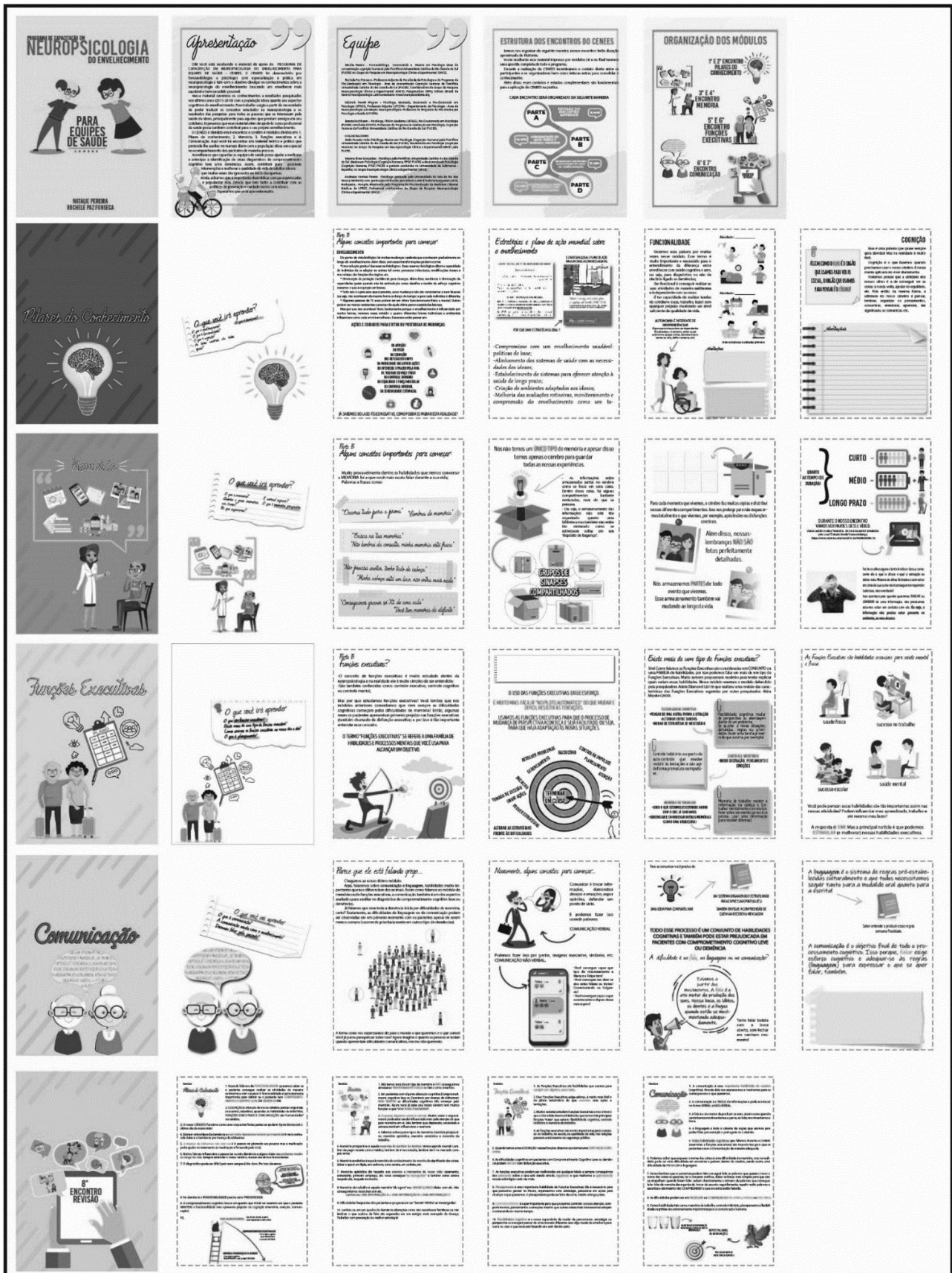


Figure 2. Sample of graphic material of each module.

Step 6 – The second round of the CENEES Program revisions: The main modifications are in Appendix 2. The macro and microstructure do not change after judgment analysis.

The final version of CENEES Program is in Appendix 3. Also, we provide a sample of graphic material in Figure 2.

## Discussion

The present study sought to describe the developmental process of the “CENEES Program – Psychoeducation for Health Staff on The Neuropsychology of Aging”. The program was conducted in six steps. Also, we described the inter-rater reliability index (0.785) after judgment analysis.



The CENEES Program is a new resource to help professionals who work within the general practice in the health field. Our study aims to help them to understand what cognitive symptoms are typical or not during the aging process. Furthermore, this research program was created with the authors' experience, established with years of neuropsychological research.

It should be noted that the raters do not suggest structural changes on the program. The judgment analysis was essential for the fluidity and dynamism of each session and also of the program as a whole. The CENEES Program is in line with the global action plan on the public health response to dementia. Especially with the underlying structural framework as (1) dementia as a public health priority; (2) dementia awareness and friendliness; (3) dementia risk reduction; and (4) dementia diagnosis, treatment, care and support (World Health Organization, 2015b, 2017; Wortmann, 2012). These include: increasing knowledge about AD by decreasing stigma; enhance self-esteem and confidence; provide links to the community; and to help dispel lingering myths around dementia (Alzheimer's Disease International, 2019).

The macro and microstructure of the CENEES Program were inspired by existing resources which were based on psychoeducation programs. Previous research was used as a reference baseline for our program: The "Staff Training in Assisted Living Residences – STAR" (Linda et al., 2005), the training program entitled "RECAPS and MESSAGE" (Broughton et al., 2011), and the "TANDEM: Communication training for informal caregivers of people with dementia" (Franzmann et al., 2016). Since the formation of the CENEES Program research, our intentions were to represent the length of programs while also creating a material of quality. By the same token, we adjusted the research to apply it within the primary care reality. We selected these specific works because they matched the theories within the scope of our program. In addition, they are key programs in the psychoeducation field.

In regard to what already exists in the literature, we believed that eight sessions would be acceptable since the majority of previous research showed a variety of parameters. A few studies used a short length of one session (45 min) (Beer et al., 2012) or three sessions (Williams et al., 2016). Other researchers used intermediate lengths of five sessions (Haberstroh et al., 2011) or six group sessions (workshops) linked with four individual sessions (Linda et al., 2005; Serelli et al., 2016). Also, there are studies that used longer lengths of eight sessions (Lingler et al., 2016); thirteen sessions (Kuske et al., 2009); or forty-eight sessions (Franzmann et al., 2016).

An additional strength of our study is the focal group (Step 3). We believed that this step was primordial to appropriately adapt the content of the CENEES Program. Specifically, we made substantial changes in the first module (Appendix 1). These changes aimed to increase the comprehensibility of concepts explored in the CENEES Program. Several modifications in the CENEES Program guidebook were necessary. It was during the focal group stage that we identified limiting beliefs, myths, and inaccurate concepts. At that moment, we recognized that this group was never given a chance to learn and exchange experiences about aging. Unfortunately, this

seems to be normal for the general practice team, since professionals do not receive appropriate education about cognitive aging (Dourado et al., 2017; Ferreira & Ruiz, 2012).

Thereafter, we made specific changes within the study since we came to the understanding that the future pilot study could be implemented after adaptations on the content of the program. Thereby, it is our responsibility to translate these concepts in a way that they may understand, while also helping them succeed within the scope of their job descriptions. It is important to bear in mind that the CENEES Program was specifically developed to aid community health workers who have only completed a high school degree. Foregoing studies also distributed several reference guides and folders as we did in our study. As well as: Linda et al. (2005) who developed stimulation training and ideas along with case videos; Haberstroh et al. (2011) who provided a manual with facilitating strategies with training activities; Bowen et al. (2012) and Franzmann et al. (2016) who developed a guide for therapists on how to perform interventions; Broughton et al. (2011) who delivered material to the nursing staff and placed intervention strategies exposed in the workplace; Serelli et al. (2016) who developed handbooks and videos and Lingler et al. (2016) who created a folder.

It is understood that there is a minimal number of studies available to the research population when it comes to psychoeducation programs like the CENEES program. We uncovered that these particular guides and programs usually explored general concepts regarding aging, as well as having limited sections of information about AD pathology (Franzmann et al., 2016; Kuske et al., 2009; Linda et al., 2005; Skills for Care & Skills for Health, 2011). We found rare programs which educated about communicative aspects of aging. However, they focused on a caregiver's role to reduce barriers in care (Broughton et al., 2011; Franzmann et al., 2016; Kuske et al., 2009; Linda et al., 2005; National Institute on Aging, 2016; Skills for Care & Skills for Health, 2011; World Health Organization, 2019). These distinct works would be comparable to Module 1 and 2 of the CENEES Program.

Additionally, we found just one article which explored the memory concept, while teaching how to improve the quality of life with memory skills (Broughton et al., 2011). Complementary, just three programs included a review or feedback session as the CENEES Program (Franzmann et al., 2016; Kuske et al., 2009; Linda et al., 2005). Lastly, another potential choice that we decided on was including concepts such as MCI and AD, located within module 1 (Fundamentals of Neuroscience). Our main aid included simple strategies that could be used daily by community health representatives when completing a patient's request. Since the focus of the CENEES Program is connected to preventive care, it is also linked to the primary care services and precise diagnosis. What's more, the CENEES Program is compatible with the "Global strategy and action plan on aging and health" made by World Health Organization (World Health Organization, 2015b; Wortmann, 2012).

Promoting the continuation of the education pertaining to dementia, it is also beneficial to the quality of life when it comes to patients and also relatives (World Health Organization, 2015b). When we provide the education for



people, they can be made aware of what is normal and what is not, while helping someone who does not know what is the proper procedure for treatment (Motta, Aguiar, & Caldas, 2011; Placideli & Ruiz, 2015).

It is also made known that several clinical factors can contribute to the diagnosis of MCI or AD, such as biological, behavioral, sociodemographic, cultural and educational (Barnett et al., 2014; Mukadam & Livingston, 2012). Also, sometimes the complexity of the diagnosis is a problem during the investigation process (Albert et al., 2011; Petersen, 2011). However, if we enriched professional's knowledge with proper training this could help patients in the long term. Specifically, when an inadequate support network is perceived, the community health workers have the duty to assist patient's complaints more closely. Occasionally, patients have difficulty to adhere to the treatment or underestimate the diagnosis, also caregivers or relatives could not understand what is happening or even doctors are not welcome (Mansfield, Noble, Sanson-Fisher, Mazza, & Bryant, 2018).

In conclusion, there seems to exist a gap in how official government institutions in Brazil spread knowledge. We identified that only a few works which were produced in the academy field reached an adequate proportion of distribution because sometimes they stay only available for researchers. However, this issue is a problem that the CENEES Program intends to minimize. Our program will be available for free, in Brazilian Portuguese, at <https://livrariaedipucrs.pucrs.br/>. and we aimed to reach into the health care system for every professional that works with the general practice on aging.

As far as we know there is no psychoeducation program on aging available containing the four subjects that are covered at the CENEES Program. We suggested that the CENEES Program could be conducted in Health Basic Units in order to help general practice professionals, especially community health workers. The CENEES Program could assist the workers' daily activities and make them comfortable to offer and build actions in the community. A pilot and follow-up study are suggested (Ducharme, Lachance, & Louise, 2015) to assess the effectiveness and the gain as a whole by those professionals who will receive the program.

## Disclosure statement

The authors report no conflicts of interest.

## Funding

This work was supported by the National Council for Scientific and Technological and Development and by CAPES, Coordination for the Improvement of Higher Education Personnel.

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## Appendix 1. Description of changes that were made on step 3 of the CENEES program

Step	Module	Main modifications
Step 3 – The focal group	Fundamentals of Neuroscience	- We changed the name of the module; - We included the main differences between stroke, traumatic brain injury and dementia; - We added information about genetic markers of dementia; - We emphasized what symptoms are expected or not during the aging normalcy;
	Memory	- We included the idea that there is not always a direct relationship between memory impairments and AD diagnosis; - Also, we added the idea that AD patients could have other abilities impaired besides memory;
	Executive Functions	- We searched for new dynamic videos;
	Communication	- We deleted complex words, concepts, and theories;

## Appendix 2. Description of changes that were made on step 5 of the CENEES program

Step	Module	Main modifications
Step 5 – The Judgment analysis	Fundamentals of Neuroscience	- We added new videos; - We adjust the group dynamic of the Part B; - We summarized the text about MCI and AD; - We added information about pharmacologic treatment and how to do the refer process in Brazil;
	Memory	- We change the order of the video presentation and the dynamic of Part B; - We modified the order of memory presentation; - We deleted complex and repeated subjects; - We inserted more note space; - We simplified some concepts; - We made improvements in memory folder; - We added more visual and graphic pieces of information to explain better working memory;
	Executive Functions	- We moved the order of information on executive functions module; - We change some specific words widely used in the neuropsychological field; - We standardized the name of abilities such as cognitive flexibility, inhibitory control, and planning;
	Communication	- We inserted a new graphic to explain better linguistic abilities; - We deleted some complex examples of communication concepts.





## Appendix 3. CENEES program content

Module	Session	Program Content	Performed dynamic	Homework
 	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>- What is aging?</li> <li>- Strategies and global action plans on aging</li> <li>- What is functionality?</li> <li>- What is cognition?</li> <li>- Knowing our brain</li> <li>- Knowing the neurons</li> <li>- What is a synapse?</li> <li>- What is neuroplasticity?</li> <li>- What is cognitive reserve?</li> <li>- What are the main differences between stroke, traumatic brain injury, and dementia?</li> </ul>	<ul style="list-style-type: none"> <li>- A piece of news that you find on the internet (true or false)</li> <li>- Summary activity with keywords.</li> </ul>	No homework activity is proposed
 	2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>- Is memory impairment in the elderly always Alzheimer's?</li> <li>- Dementia: is there more than one type?</li> <li>- What is Alzheimer's Disease?</li> <li>- What is the main cause of Alzheimer's Disease?</li> <li>- Are there changes in the brain? What type, signs or symptoms?</li> <li>- Is there any relationship to the genetic code?</li> <li>- Could the pharmacological treatment help in the healing process?</li> <li>- What medication is available in Brazil's primary care system? How to refer patients?</li> <li>- What are the potentially modifiable risk factors regarding dementia?</li> <li>- How do we diagnose dementia?</li> <li>- What is Mild Cognitive Impairment?</li> <li>- Are there differences between Mild Cognitive Impairment and dementia?</li> <li>- How do we diagnose Mild Cognitive Impairment?</li> <li>- What is a normal aging process?</li> </ul>	<ul style="list-style-type: none"> <li>- A piece of news that you find on the internet (true or false?)</li> <li>- Comparative activity: Mild Cognitive Impairment versus dementia due to Alzheimer's Disease.</li> </ul>	<ul style="list-style-type: none"> <li>- During the week, make notes about two patients who could have some of the struggles that we discussed today.</li> </ul>
	3 <sup>rd</sup>	<ul style="list-style-type: none"> <li>- What is memory?</li> <li>- How does our brain make memories?</li> <li>- How many and which types of memories do we have?</li> <li>- Why do we forget? Is it common?</li> <li>- How do we improve our memory and slow down forgetfulness during the aging process?</li> <li>- What is prospective memory?</li> </ul>	<ul style="list-style-type: none"> <li>- Understanding prospective memory better.</li> <li>- Group activity: Is that prospective memory?</li> </ul>	<ul style="list-style-type: none"> <li>- Make notes from three situations that you observe during the week which have a relationship with prospective memory.</li> <li>- Write two questions that will help you when you want to ask about prospective memory problems.</li> </ul>
	4 <sup>th</sup>	<ul style="list-style-type: none"> <li>- What is episodic memory?</li> <li>- What is semantic memory?</li> <li>- What is working memory?</li> <li>- Types of memory and the time;</li> <li>- How do we improve our memory?</li> </ul>	<ul style="list-style-type: none"> <li>- Make notes of moments that you lived with tranquility, anxiety, and learning. Please remember instants that happened last week, last month and last year.</li> <li>- What is this object?</li> <li>- Group activity: someone will initiate a brief story and each participant will repeat all the phrases from the sketch. Also, the participant will add new information at the end. The next participant will do the same thing: repeat all the story until the last participant adds new information.</li> <li>- Identifying our memories.</li> </ul>	<ul style="list-style-type: none"> <li>- Write two questions that will help you in your job activities about each memory we discussed today: episodic memory, semantic memory, and working memory. These questions need to be taken from the perspective of how patients and relatives could answer those topics.</li> </ul>

(continued)



## Appendix 3. Continued.

Module	Session	Program Content	Performed dynamic	Homework
<p><i>Executive Functions</i></p> 	5 <sup>th</sup>	<ul style="list-style-type: none"> <li>- What are Executive Functions?</li> <li>- Is there more than one type of Executive Functions?</li> <li>- Executive Functions are essential abilities to physical and mental health.</li> <li>- How do we use Executive Functions daily?</li> <li>- What happens when Executive Functions fail?</li> <li>- Executive functions and the aging process;</li> <li>- Can we improve Executive Functions at any time?</li> <li>- What is Planning?</li> </ul>	<ul style="list-style-type: none"> <li>- How do we make a plan to buy a car?</li> <li>- What do you did today that that needed planning abilities?</li> <li>- Group activity: you will analyze two brief stories and will discover what is missing regarding planning.</li> </ul>	<ul style="list-style-type: none"> <li>- Write four questions about Executive Functions. These questions need to be taken from the perspective of how patients and relatives could answer those topics.</li> </ul>
<p><i>Executive Functions</i></p> 	6 <sup>th</sup>	<ul style="list-style-type: none"> <li>- What is Inhibitory Control?</li> <li>- What is Cognitive Flexibility?</li> <li>- How do we stimulate Executive Functions?</li> </ul>	<ul style="list-style-type: none"> <li>- You will say things that exist in a school, supermarket, and health basic unit as fast you can. You may not say words which begin with C or S.</li> <li>- You are going to explain what you learned so far with the CENEES Program without using the words: aging, patient, executive functions, memory, and dementia.</li> <li>- You will follow the opposite rule of traffic light colors. E.g: if I say the color red, you will walk instead of stop.</li> <li>- Write about a moment that you had a lot of cognitive flexibility.</li> <li>- Find new solutions for the same problem.</li> <li>- What type of activities can we do with a lower budget to improve executive functions daily?</li> </ul>	<ul style="list-style-type: none"> <li>- Write two questions about inhibitory control and two more about cognitive flexibility. These questions need to be taken from the perspective of how patients and relatives could answer those topics.</li> </ul>
<p><i>Communication</i></p> 	7 <sup>th</sup>	<ul style="list-style-type: none"> <li>- What are the main differences between speech, language, and communication?</li> <li>- Are communication skills modifiable during aging?</li> <li>- Timeline of linguistic problems during aging.</li> <li>- Discourse abilities can help to understand if the patient is worsening (types of impairments);</li> <li>- The relationship between communication and cognitive abilities.</li> <li>- How can I help the patient during the conversation?</li> </ul>	<ul style="list-style-type: none"> <li>- Group activity: you will make gestures to explain a word or concept. It is forbidden to speak.</li> <li>- We will discuss why cognitive abilities are important during de conversation.</li> <li>- We are going to listen to examples during their conversations task.</li> </ul>	<ul style="list-style-type: none"> <li>- Write three questions about communication that include what we discussed in this module. These questions need to be taken from the perspective of how patients and relatives could answer those topics.</li> </ul>
	8 <sup>th</sup>	<ul style="list-style-type: none"> <li>- Review of the main highlight of each session.</li> </ul>	No dynamic is proposed	No homework activity was proposed