(Geronto)Technologies of care for old people with Alzheimer's disease and their families: contribution of awareness/training workshops

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Abstract

Objective: To describe (geronto)technologies of care for old people with Alzheimer's disease and their families, from awareness/training workshops. *Methods:* Strategic action research, developed with 12 nursing, physiotherapy, dentistry and occupational therapy students from a University of Rio Grande do Sul, Brazil. The data collected from September to December 2019, through semi-structured interview, after awareness-raising workshops on care (geronto) technologies for old people and their families, were subjected to textual discursive analysis. *Results:* They allowed the description of (geronto)technology in the form of a product: identification plates for objects and rooms; products for organizing medication; Identification badge; support bars, rounders, non-slip mats and various adaptations; bath calendar; Games, books and manual activities. And, in the form of process/knowledge/strategies: dialogue, memories and negotiations; accompanying the old people and advising neighbors on Alzheimer's disease; and, division of responsibilities. *Conclusion:* The awareness/training workshops contributed to the knowledge of students from different training centers and showed potential to contribute to the care of old people with Alzheimer's disease and their families, through suggested (geronto)technologies.

Keywords: Health of the Elderly. Alzheimer disease. Family. Technology. Health Personnel.

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INTRODUCTION

The aging process makes the human being more susceptible to chronic diseases of progressive character, as is the case of Alzheimer's disease (AD), which is responsible for approximately 50 to 75% of dementias in several countries[1]. In Brazil, it is estimated that one million people are affected by AD; however, there is still not much data regarding its incidence in the country[2].

Due to its neurodegenerative characteristic, AD compromises the physical, mental and social integrity of the old person, triggering, over time, a situation of dependence that requires everything from helping with Activities of Daily Living (ADLs), to comprehensive and complex care, performed, in most cases, by a family member at home[3]. This situation sometimes leads to the need for professional assistance.

The nurse is the professional responsible for leading and systematizing the care process for people in the different scenarios in which they find themselves. However, it is not feasible for a single professional to be able to develop care in the context of AD, in an expanded and consistent way with individual/collective needs[4]. In this sense, it is necessary for health professionals to dialogue and, together, to develop expanded care plans, which should focus on the old person and family members/caregivers, with a view to assisting them in minimizing the emotional changes resulting from of the care process[3].

Public policies, in the context of the health of old people, recommend the use of creative strategies that favor communication between professional, subject and group[5]. Thus, some professionals, teaching and health institutions have invested efforts in the context of Gerontology, in the understanding and use of gerontotechnological possibilities[6].

Among these, there is the use of complex (geronto) care-educational technologies, comprised of products, processes, strategies, services and/or knowledge, with the care-educational purpose of old people and their family members/caregivers, as a result of a complex collective construction/experience that values the relationships, interactions and feedback of those involved, through inter-multi-trans-meta-disciplinary knowledge[7].

Thus, it is evident that (geronto)technology is sometimes not a product, but the result of work that involves a set of actions that aim at health care[6]. They are characterized as important tools for the development of the care model, as they enhance care skills, both for the old person, as well as for the family member and/or caregiver. And they assist in promoting effective strategies for maintaining and improving health care for old people[8].

In this context, interventions that aim to train future health professionals to use (geronto) technologies are necessary in order to assist in the daily care of old people with AD. However, as important as carrying out an intervention is to assess its contribution to the identification of (geronto)technologies, a fact that justifies the need and relevance of this research. It is also justified, anchored in that described by the Ministry of Health (MH), which points out issues related to the health of old people, as well as technologies, as research priorities in Brazil[9].

In view of the above, the question arises: What (geronto) care technologies can be thought of to assist in the daily care of old people with Alzheimer's disease? In an attempt to answer the question, the objective was to describe (geronto) care technologies for old people with Alzheimer's disease and their families, from awareness/training workshops.

METHOD

It is a strategic action-research[10], held with students from the last semester of Nursing, Physiotherapy, Dentistry and Occupational Therapy at a university, in the State of Rio Grande do Sul (RS), Brazil. Participants were randomly selected from the call list, made available by the professor, at which point the invitation was made to five students from each course.

Academics from the last semester were selected, as they had already taken the disciplines that deal with

the theme of aging in their undergraduate course, in addition to having already experienced different realities offered during their training process. As inclusion criteria, the following were established: being an academic in one of the aforementioned health courses; being in the last semester of the course and have already taken the subjects related to gerontology, geriatrics or equivalent. Students on medical leave, maternity leave or academic exchanges on the date of the draw were excluded. Up to the end of the study, 12 academics formed the *corpus* of this research.

In September 2019, the participants underwent an individual semi-structured interview (moment 1), in a university classroom, conducted by the questions: *Have you heard/read anything about (geronto)technologies? Have you ever used some kind of (geronto)technology?* This moment allowed the identification of knowledge gaps and, therefore, aroused the need for intervention.

Thus, in November 2019, participants underwent the intervention, in the form of workshops (moment 2), with a view to raising awareness and training on issues related to (geronto) care technologies, in the context of old people with AD and their families. The workshops were held from a conversation circle, in a university classroom, and lasted an average of one and a half hours. The activity was coordinated by one of the five researchers, who is a nurse with a specialization in Gerontology.

The workshops started with welcoming participants and thanking them for participating in the research; then, each participant was introduced, so that the group could get to know each other. In sequence, the researchers talked to the participants, explaining aspects related to aging and about the (geronto) care technologies, expanding some points and deepening others, as they perceived the need or were requested by the participants. To aid in the activities, audiovisual material was used and students were encouraged to verbalize experiences they had experienced during the training process.

After the awareness and training workshops, semi-structured interviews with each participant were held again in November and December 2019 (moment 3). Initially, the questions used in the interview (moment 1) were resumed, in order to identify whether the knowledge gaps had been overcome or whether other moments of awareness and training should be programmed. From the understanding that the students had been sensitized, the question was asked: What (geronto)technologies can be adopted by family members/caregivers to assist them in their daily care for the old person?

The interviews (moment 1 and moment 3) were recorded with an MP3 player and transcribed in full, mechanographically, by the researchers, with the aid of the Microsoft Word program (version 16.31). The data were processed using the discursive textual analysis technique, organized from a recursive sequence of three components: unitarization, establishment of relationships and communication[11]. Initially, the researchers examined the texts in depth, forming the central category, from the identification of (geronto)technologies suggested by the academics. It was unified in two base units; in the first unit, all (geronto)technologies were grouped into product form; in the second, in the form of process/knowledge and/or strategies.

Afterwards, a new reading was made from the central category and the base units, seeking to establish relationships between them, that is, each report inserted in the base units was read in detail, when they were separated into different units, according to the purpose of using the (geronto) technology. Finally, we proceeded to the last stage of the analysis method, by the communication process between the (geronto)technologies in the form of product and the (geronto)technologies in the form of process/knowledge/strategy, according to the need to which they were directed, resulting in the categories[11].

Ethical and legal precepts were considered, according to Resolution 466/12 of MH[12]. The Project was approved by the Research Ethics Committee under Opinion nº 3.368.520 and CAAE: 14430619.5.0000.5306. The anonymity of the participants was maintained, identifying them by the letter A (academic) followed by a number (A1, A2 ... A12).

RESULTS

Of the 12 survey participants, 11 were female and one male, aged between 20 and 37 years. Of these, four were studying nursing; five, dentistry; two, occupational therapy; and one, physical therapy. The analyzed data allowed the construction of a central category: (geronto) care technologies for old people with Alzheimer's disease and their families. It was unified in two basic units: (geronto) technology in the form of a product; (geronto) technologies in the form of Process/Knowledge/Strategy (PKS). Such units generated nine categories, as shown in Figure 1.

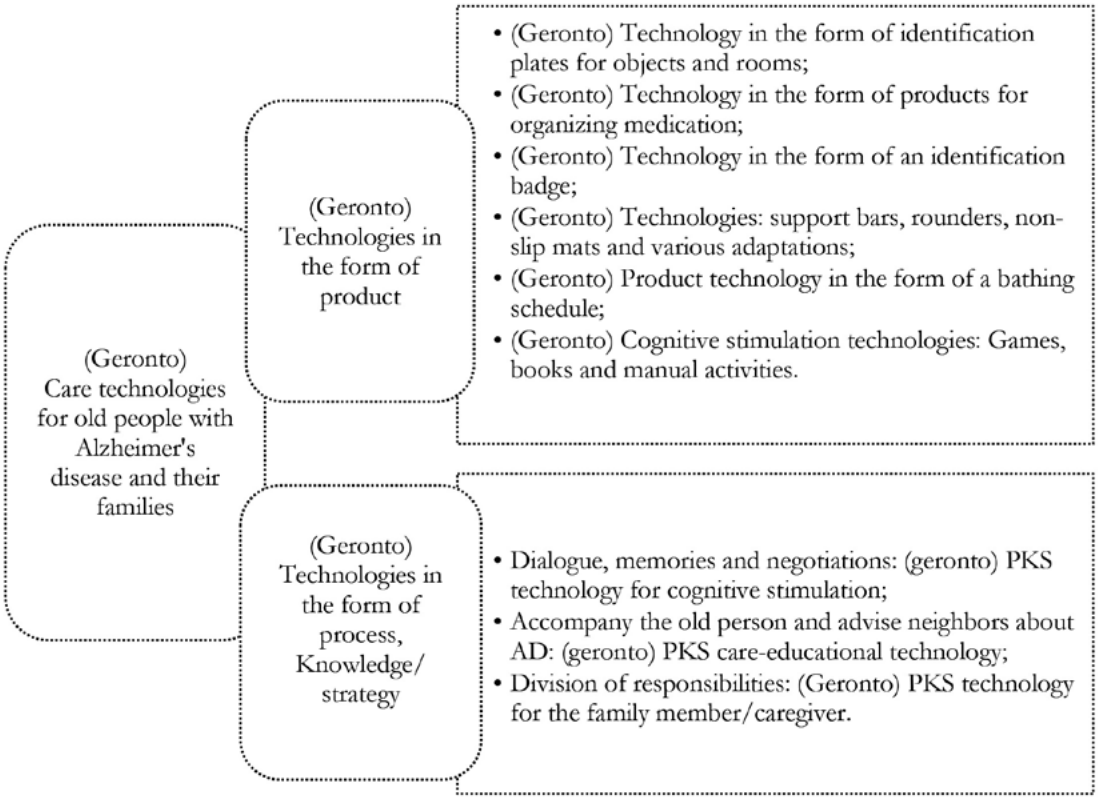

Figure 1. Demonstrative scheme of the central category, base units and categories.

Source: Authors, 2020.

(Geronto)Technology in the form of identification plates for objects and rooms

One of the (geronto) technologies, in the form of a product, suggested by academics in the health field, deals with signs for the identification of objects and furniture in the home of the old person with AD.

> "[...] we can also identify the parts of the house, bathroom, kitchen, with signs [...]" (A4)

> "[...] rooms can be identified with signs to facilitate for the old person [...]" (A6)

> "Signs can be placed inside the house reminding the name of the object and rooms of the house [...]" (A7)

> "Place signs in the house to make it easier to know the parts and objects [...]; organize the environment to avoid falls; to indicate, with small signs, where the plates, cutlery are; make reminders of the tasks that the old person has to do, organize their routine" (A9).

(Geronto)Technology in the form of products for organizing medication

Strategies to assist the old person and their family in the organization of medicines were also signaled by academics as (geronto)technologies in the form of a product. It is a matter of separating them, by schedule or shift, in devices such as small pots. Also, number the pills on the blister pack, so that the number assigned on top of the pill label represents the day on which it should be ingested/administered.

> "Using the medication organization box, too, the numbering can be placed on the medication pack itself, on top of each pill, representing the day to be taken, to know what medicine they took, always trying to make them more independent [...]" (A2)

> "Separate the medication according to the shift to be taken, it can be in jars, or writing on the cards [...]" (A7)

> "Separate the medicines by shift, in jars, and use reminders; always try to include the old person in the activities carried out" (A9).

> "[...] the medicine storage box according to the shift: morning, afternoon and night, can be used [...]" (A11)

(Geronto)Technology in the form of identification badge

Another (geronto)technology in the form of a product, suggested by academics, concerns the making of a badge with data about the old person, such as the name, the information that the person lives with AD, as well as the telephone number of a family member/caregiver .

> "[...] embroider on some coat that the old person usually wears their name, the information that they have Alzheimer's and the phone number of a family member/caregiver" (A4).

> "An identification badge can be made for the old person, embroidering on their clothes that they have Alzheimer's, the name of the old person and the caregiver's phone number" (A9).

(Geronto)Technologies: support bars, rounders, non-slip mats and various adaptations

Support bars, rounders for furniture corners, non-slip mats and various adaptations, such as cutlery, furniture height and toilet seat, were also (geronto)technologies suggested by the academics from health courses.

> "Adapting the height of the furniture with lifting devices that can be placed on the feet of beds, sofas, chairs and other furniture, adaptations in their corners to round them [...]" (A1)

> "[...] putting on handles in the bathroom, the support bars placed in the bathroom and the use of a wheelchair [...]" (A2)

> "[...] in the bathroom, placing non-slip mats, support bars, keeping the furniture at an easily accessible height and with rounded corners" (A4).

> "Putting on a handrail, removing carpet, protecting all corners to avoid getting hurt, putting on a raised toilet seat in the toilet bowl, as they no longer have so much balance [...] adapted cutlery, remove the rugs to reduce the risk of falling [...]" (A7)

> "[...] raising the height of the furniture, removing objects from the floor that may cause the old person to fall, such as carpets [...]" (A9)

> "[...] bars on the wall to help with balance and locomotion" (A11).

(Geronto) Product technology in the form of a bathing schedule

Another (geronto)technology in the form of a suggested product refers to the use of a device called the bathing schedule. It is the materialization of a strategy used to negotiate body hygiene for the old person.

> "Always try to negotiate with the old person with Alzheimer's, such as the bathing schedule [...]" (A3)

> "Always be stimulating, the bathing schedule, as was said in the training. As he supported Internacional, she created a table on the wall,

the day he took a shower it was Internacional's goal, the day he didn't take it, it was Grêmio's goal. In this way, try to adapt to what the old person likes, as this will be a stimulus and will avoid discussions; one should never try to contradict the old person [...]" (A10)

"The bathing schedule and negotiations must be implemented [...]" (A11)

(Geronto) Cognitive stimulation technologies: games, books and manual activities

For academics participating in this research, the (geronto) used in product form are relevant, with the purpose of cognitive stimulation of old people. Among these, memory games, such as crosswords, books and manual activities, such as knitting, stood out.

"[...] stimulating memory with memory games [...] performing activities such as crosswords, when still not in a more advanced stage" (A1).

"[...] always stimulating them with books, tours [...]" (A2)

"[...] offering reading materials, or knitting needles to make them feel important and useful [...]" (A4)

"[...] it is also good to continue stimulating these old people with memory games" (A6).

"[...] always working with the old person's cognitive, with activities that they liked to do before, or even memory game [...]" (A9)

"Activities that stimulate thinking, memory, such as games" (A12).

Dialogue, memories and negotiations: (geronto) PKS technologies for cognitive stimulation

(Geronto)Technologies for the cognitive stimulation of the old person were also suggested in the form of process/knowledge and strategy, such as dialogue, stimulation of memories and negotiations. In addition, patience, the need to maintain autonomy and independence for ADLs and Instrumental Activities of Daily Living (IADLs), such as cooking, brushing teeth and performing body hygiene alone.

"[...] try to talk to the person with Alzheimer's as much as possible, bring current information, even more if they were people who liked to get information, news" (A1).

"[...] try to never upset the person, if the old person does not feel at home, take a walk with them, until they feel they have arrived home, be very patient, answer as many times as necessary [...]" (A4)

"[...] try to maintain their autonomy and independence, such as cooking, brushing teeth, bathing alone, always with a lot of dialogue and with the supervision of the caregiver" (A9).

"[...] talk a lot with the old person and bring memories to make them as comfortable as possible [...]. The caregiver should never contradict or say that the old person with Alzheimer's disease is wrong, as they [old person] will be agitated; the caregiver must always adapt to their reality" (A11).

Accompany the old person and advise neighbors about AD: (geronto) PKS care-educational technology

The monitoring of the old person to go out on the street, without, however, them noticing being accompanied due to their illness, was suggested as (geronto)technology in the form of process/knowledge/strategy. The orientation of neighbors about AD and the request that they communicate to the family member/caregiver if they see the old person alone on the street was also suggested by academics, as (geronto) educational-care technology in the form of PKS.

"[...] when the old person goes out on the street, go behind them, discreetly, or find an excuse to accompany them [...]" (A2)

"Always find a way to accompany them when they leave the house, warn all neighbors about the old person having Alzheimer's, explain about the disease and guide them to, when they suspect or find them lost, call the family member [...]" (A4)

Division of responsibilities: (geronto) PKS technology for family members/caregivers

Another (geronto)technology in the form of process/knowledge/strategy suggested refers to the division of responsibilities, alternation of care, in addition to time off for the family member/caregiver, which denotes the understanding of care for the caregiver by the academics of Health area.

> "[...] alternate care with another person at least once a week, so that the family caregiver can rest one day, as it is a very exhausting job [...]" (A3)

> "It is also necessary to share the responsibilities with the family, not only overburden anyone [...]" (A4)

> "[...] it is always good to leave a day off for the caregiver because, as they will be constantly with the old person, they will be exhausted. So, with at least one day off, the risk of getting sick will already decrease" (A10).

DISCUSSION

The awareness and training workshop developed in this research, enabled the identification of (geronto) technologies divided into two groups: in the form of product and the process/knowledge/strategy. The (geronto)technologies in the form of a product are characterized by equipment, machines and the materialization of care strategies. In the form of process/knowledge/strategy, there are the various tools, not materialized, used to care for the old people[6].

One of the (geronto) technologies in the form of products suggested by academics refers to the use of signs to identify objects and furniture in the old person's home. Such (geronto)technologies have a potential impact on the health of the old person with AD, especially in the initial phase, in which language difficulties, recent memory loss and the ability to recognize places occur[13].

Corroborating the data of the present research, a study developed in a municipality in the north of Ceará (CE), described that the adaptation of the physical environment helps in maintaining the autonomy and independence of the old person with AD. Therefore, it highlights, among the (geronto) technologies aimed at the home, the signs for the identification of the rooms of the house[14].

The academics suggested the organization of the medication, by means of jars, separating it by morning, afternoon and night, as well as numbering the pills on the pack, so that the number assigned on top of the pill label represents the day on which it must be ingested/administered. These (geronto) technologies are relevant in the three stages of AD, with an emphasis on the moderate or intermediate phase, characterized by increasing memory loss and the beginning of language changes, reasoning and motor difficulties, which leads to the need for constant care. And in the advanced phase, when the old person with AD has bed restriction, mutism, retention and or intestinal/urinary incontinence[14].

In these phases, the number of medications tends to increase due to the manifestations of the disease. Thus, the organization of medication is necessary for the care of the old person. However, the success in the use of (geronto)technologies will be greater if they are developed/used according to the needs of each old person, assisting family members/caregivers in the administration of medications[6].

The badge containing the name of the old person, the information that they live with AD, as well as the phone number of a family member/caregiver was also suggested by the academics, as (geronto) technology in the form of a product. Similar data was evidenced in a research that aimed to identify the gerontechnologies developed/used by family members/caregivers as care strategies for the old person/family with AD[6]. In the research in question, family members developed an identification badge or bracelet for the old person, with the family's telephone contact. Thus, if the old person left home and did not remember the way to return, people could help them, through the information of the badge/bracelet[6].

Support bars, rounders for furniture corners, non-slip rugs and various adaptations in cutlery, at the height of furniture and in the toilet seat were also (geronto) technologies suggested by academics

in health courses. Similar data was evidenced in a study that aimed to know challenges and care technologies developed by family members/caregivers of patients with AD[15].

By its nature, it is understood that the badge, the support bars, as well as the other (geronto) technologies used with the objective of physical security of the old person have a greater impact on the intermediate stage of AD, since the old person still maintains autonomy and independence, but already has a marked limitation. Thus, it is possible that they leave home and get lost along the way due to cognitive decline, as well as suffering physical injuries resulting from functional impairment.

Also due to cognitive impairment, it is common for old people with AD, in the intermediate stage of the disease, to refuse to bathe or argue that they have already done so[4]. In this regard, the academics suggested as (geronto)technology, in the form of a product, the use of a device called the bathing schedule. This (geronto)technology was presented, for the first time, by Brazilian nurses and has the potential to assist in the old person's acceptance of body hygiene, reducing irritability, in addition to reducing the burden on family members/caregivers[16]. The schedule can serve as an explanation for the construction of other forms of (geronto)technologies, according to the preferences of each person[16].

Still on the cognitive aspect, the academics suggested (geronto) technologies for the purpose of cognitive stimulation of old people. Among the products suggested for this purpose, memory games stood out; crosswords; books and manual activities, such as knitting. A study carried out with 31 old people, with a focus on promoting active and healthy aging, showed that the use of cognitive gerontechnologies is positive and they act as tools that facilitate nursing care for the old person[17].

For cognitive stimulation, (geronto)technologies in the form of process/knowledge/strategies were also referred to, of which dialogue, stimulation of memories and negotiations with the old person stood out. A study that aimed to know the challenges and technologies of care developed by caregivers of people with AD describes that dialogue and the stimulation of memories from the past are important tools for the attempt to maintain cognition for a longer time, aiming at prolonging integration and social connection of the old person[15].

It is suggested that these (geronto)technologies be employed from the initial stage of the disease, as it is understood that the greater the cognitive stimulation of the old person, the greater the preservation of cognition or the slowing of neuronal degradation. Cognitive performance involves mental functioning, including perception, attention, memory, reasoning, decision making, problem solving and formation of complex structures of knowledge[18], which suffer a considerable decline in the intermediate stage of AD.

With regard to the safety of the old person, the academics suggested that they be monitored when they go out on the street, without, however, them realizing that they are being monitored due to their illness. In addition, they signaled the need for guidance for neighbors about AD and the request that they communicate to the family member/caregiver, if they see the old person alone on the street. These data were also evidenced in other research[4,6].

This (geronto)technology in the form of PKS has a considerable impact on the health of the old person with AD. It should be noted that the more autonomy and independence the old person has, the longer their functionality will be preserved. Functional capacity can be defined as the ability to perform ADLs, which are divided into basic activities of daily living (BADLs), which include the ability to perform personal hygiene, sphincter control and feeding; and instrumental activities of daily living (IADLs), comprised of the ability to prepare a meal, perform housework, care for finances, correspondence and administering the medication themselves[19].

Thus, there is a close relationship between functional and cognitive capacity, as well as the level of autonomy and independence with the health of the old person, and it is necessary to encourage such capacities for a longer period of time in people with AD. For that, the (geronto)technologies in the form of product and PKS demonstrate their practical applicability in this context.

Regarding the family member/caregiver, the academics suggested the need to share the responsibilities, the alternation of care and the time off for the caregiver, which denotes the understanding of care for the caregiver by academics from the health area. This data corroborates with the study that describes that the daily care of an old person with AD produces emotional, psychological and financial stress, due to the high demand for care time that the old person derives from the loss of cognitive functions, pointing out the need for support and care for family members/caregivers[20-21].

This research had limitations, of which the scarcity of bibliographies on technologies related to the theme of AD in old people and families stands out. From the results obtained, the contribution of this research to the teaching and practice of gerontology and geriatrics in health courses is evident, since it helped in the teaching process during the training of professionals from different centers, which will possibly have an impact on care for old people/families.

CONCLUSION

The study made it possible to describe suggestions for (geronto) care technologies for old people with Alzheimer's disease and their families, based on awareness and training workshops. They were divided into two groups: that of (geronto)technologies in the form of a product; and process/knowledge/strategy.

In the form of process/knowledge/strategy, dialogue, stimulation of memories and negotiations with the old person are found mainly; the monitoring of the old person when going out on the street, without them realizing that they are being monitored due to their illness; and the orientation of neighbors about Alzheimer's disease. These (geronto)technologies can be used in patients with dementia in the early and intermediate stages, since in these stages, old people still have the ability to remember past events and have cognitive and motor conditions for walking.

The division of responsibilities, alternation of care and time off for the caregiver were also evidenced in this research as (geronto) technologies in the form of process/knowledge/strategy. They are important in all stages of Alzheimer's disease, especially in the advanced stage, when the demands for care become constant and more exhausting for caregivers.

In the form of a product, the identification signs of objects and rooms are grouped; the identification badge; support bars, rounders, non-slip mats; the bathing schedule; games, books and manual activities for cognitive stimulation of old people. Such (geronto) technologies can be used especially in the initial and intermediate stages of the disease. Devices such as pots for organizing medications have a greater contribution in the moderate and severe stages, moments when the old person no longer administer their medication regimen alone. Various adaptations, such as devices for raising the height of the bed and the toilet, are (geronto) technologies with the greatest contribution in the advanced stage of the disease, when the old person is restricted to the bed or with marked motor limitation.

It was possible to observe that the (geronto) technological models of the strategies adopted in this study can be incorporated into the day-to-day care of patients with dementia, as long as they are previously evaluated regarding their evolutionary phase. It is understood, in this context, that the (geronto)technologies suggested by academics can directly contribute to care, making it possible to improve the daily lives of old people and family members/caregivers.

It is suggested that research be developed, in different scenarios, in order to assist in the production of knowledge about aging, Alzheimer's disease and in the strengthening and expansion of (geronto) care technologies.

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