

Staying Connected with Aged Populations in Times of COVID-19: An Interview Study of the Role of Portuguese Institutions and Municipalities

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Abstract. In times of social confinement frequently associated with COVID-19 pandemics, an increasing dependence of aged populations on digital media to maintain social interactions and participation in society was observed. Although courses for action on the access to digital media by aged populations and the potential harms of digital inclusion have been acknowledged in the literature, far too little attention has been devoted to the challenges and *in situ* measures undertaken by local entities targeted to aged populations. The purpose of this study is to analyze the strategies adopted by Portuguese Universities of the Third Age, Municipalities, among other Institutional Care for Aged Populations to ensure communication and active participation of older adults in society and the role of digital media in that process. A total of 72 Portuguese entities developing initiatives addressed to aged populations were interviewed, including Municipalities and Universities of the Third Age, aiming at gathering their perspectives on the challenges and practices of using digital media to involve the ageing population in the community. Data was collected employing a semi-structured interview and content analysis was performed. Findings indicate that although participants found difficulty in adhering to activities owing to the financial and social consequences of the pandemic, most had to restructure their activities to maintain connections and routines. Conclusions offer some important insights into practices to foster participation within the communities using digital platforms.

Keywords: Social Connection, COVID-19, Information and Communication Technologies, Aged Populations, Interview.

1 Introduction

The global pandemic of COVID-19 caused by the coronavirus (SARS-CoV-2 virus) disease has radically changed the lives of billions of people. It has suspended family plans, altered routines, limited jobs, and challenged all sectors of society, as it has

become a global public health crisis, and, consequently, affected the rapid escalation of the overstretched healthcare system [1]. The work interruption of work activities also brought additional societal, economic, and psychological impacts. Li and Mutchler [2] ascertain that people with higher living expenses are more likely to be exposed to higher levels of infection. Moreover, the authors emphasize that there is a higher probability of aged populations being dismissed from their jobs or having their hours reduced [2].

The mortality rate of COVID-19 has reached 20% among people aged 80 years and older [3], being older adults the group with the highest death reports, especially those with chronic and underlying medical conditions [4]. Considering the biological and psychosocial vulnerabilities inherent to age, the older age group tends to be the group most at risk of contracting the disease. In Portugal, of the total 18283 deaths recorded until 17 November 2021, 11929 were over 80 years old, 5581 between 60 and 79 years old, and 524 from 50 to 59 years old [5] – a total of 18034 (approximately 99%) occurrences over the age of 50.

Ageing is often stereotyped as weakness, deterioration, and morbidity [6], and these societal ageist behaviors have influenced the health care system in clinical decision-making and delay of medical treatment, which may lead to senicide (*i.e.*, extreme form of ageism), resulting in the murder or abandonment to death of aged populations [7]. Furthermore, Ayalon and colleagues [8] highlighted ageist stereotypes found in public debates during the pandemic, such as (i) referring to aged populations an ultimately parasitic states unworthy of protection, (ii) naming the virus Boomer Remover, (iii) suggesting that aged populations should sacrifice themselves for the remaining generations, and (iv) blaming them for their allegedly selfish and irresponsible attitudes towards the ecological consequences of the COVID-19 outbreak. These preconceived ideas may be linked to the reports of triage decisions in situations of life and death (*i.e.*, doctors chose between older and younger individuals), which lead to the lack of health care support for aged populations since they did not receive intensive care or ventilation therapy [9,10].

To limit the spread of the coronavirus, several practices were implemented by governments, aimed at physical and social distancing [11]. Teleworking, handwashing, the use of face protection, and isolation were some impositions and recommendations given by public health authorities [12]. This intense change in aged populations' living has brought several challenges to their health and wellbeing, contributing not only to the sense of loneliness and depression but also to sedentarism. Moreover, the isolation has subsequent negative outcomes such as (i) feebleness, fractures, and falls due to the lack of exercise; (ii) cognitive stimulation decrease alongside an increase of behavioral symptoms of dementia associated with the deprivation of socialization and engagement; (iii) early heart failure due to changes in food consumption and availability of resources [12]; and (iv) higher stages of emotional and social solitude due to lack of face-to-face contact, personal losses, death of friends and relatives, and pandemic general threats [13].

Considering this reality, the institutions and municipalities that had social workers and other gerontological scholars had to respond, early on, to aged populations' wellbeing, addressing the need of implementing strategies to protect them and raise awareness about loneliness and social isolation [14]. During the outbreak, especially at the most critical times, general recommendations of hygiene and respiratory

etiquette were followed, by limiting the presence of larger groups (*e.g.*, group activities, family, or other visits), and beginning the social distancing promotion among aged populations. Face-to-face contacts and activities began to be done virtually through individual devices and videoconferencing, in which physical distancing, personal protective equipment, and digital platforms were introduced. Daily support telephone calls, home delivery services, virtual and telephone social and health care, preventive education, and news updates have become part of the practice of social work, which has dramatically changed [15].

The purpose of this research is to analyze the adopted strategies by Portuguese institutions and municipalities during the COVID-19 outbreak to ensure continued communication and active participation of aged populations in society. Thus, the role of digital media in that process is discussed.

This paper is structured into six chapters, including Introduction and Conclusion. Chapter 2, *Background Research*, provides a literature analysis on the subject of the relevance of Information and Communication Technologies (ICT). Chapter 3, *The Interview Study*, describes the procedures undertaken for the interview, as well as the participants' selection criteria, their characteristics, the interview structure, the analysis processes applied, and ethical considerations. Chapter 4, *Findings*, presents the main results of the conducted interviews, divided by four main identified nodes – *i.e.*, contributions, pandemic constraints, barriers, and solutions. The results are then discussed in Chapter 5, and the article ends with some limitations and outlined future directions.

2 Background Research

These practices were pointed out to be instrumental in mitigating the spread of the virus. However, these are significantly affected with behavioral and communication patterns, and the mental health and wellbeing of aged populations [16,17]. In such an unusual and unprecedented period, there has never been so much discourse about social distancing. The difficulties caused by the sudden change in personal habits are associated with the gap that exists between those who have digital skills to manage their lives with online resources and those who do not. Those who don't have access to these find themselves digitally and socially excluded. Data from the (Portuguese) National Statistics Institute (INE) reveals that the proportion of Internet users declines sharply with age since with people under 55 years old, the proportion of ICT use is over 80%; in the 55 to 64 age group is 59%; and 34% for the population aged 65 years or over [18]. These data are corroborated by PORDATA - Contemporary Portugal database (2021) to the year 2019, in which only 33% of people over 65 years old use the Internet in comparison to the 57% of people aged 55 to 64 years old. In 2021, reality changed showing that 48% of aged populations over 65 years old use the Internet, as well as 71% of people aged 55 to 64 years old [19].

Even if an increase in the use of technologies is noticeable in comparison with younger groups, aged populations are less likely to take advantage of the opportunities delivered by current ICT, such as smartphones, tablets, and high-speed Internet services. This is because aged populations (i) tend not to use the Internet, (ii)

cannot pay for Internet access or ICT devices, (iii) do not have smart technologies to use video conferencing apps to virtually connect with people, or (iv) do not have sufficient skills to use ICT, regardless its access [20]. Aged populations in long-stay care institutions (*e.g.*, nursing homes, day centers) with physical or cognitive limitations may also be inhibited from exploring ICT without assistance, considering there may be a significant variation in their ability, willingness, and access to use ICT [20].

It is worth emphasizing that the use of ICT by aged populations is often included in the digital divide spectrum. Fostering digital inclusion has been increasingly vital, given that the COVID pandemic has brought an (almost total) migration to digital life, and it is necessary to encourage more robust participation in ICT [21]. According to Gorenko and colleagues [22], there are several challenges to a successful implementation of ICT as a form of social and psychological intervention among aged populations, particularly during the current COVID-19 pandemic: (a) attitudes toward necessary technologies for communication and information; (b) ability to access those necessary technologies; (c) limited experience and skills in using the technology; and (d) the need for third-party involvement. The same authors recommend: (i) an evaluation for preferences and barriers to technology use, by analyzing the preference of digital platforms to communicate and consider the pre-pandemic digital literacy; (ii) respect the aged populations' privacy (*e.g.*, obtain an informed consent); (iii) to raise awareness of available services (*e.g.*, apps, digital platforms, learning programs); and the most important, (iv) to make regular contact and check how aged populations are managing not only the technologies but also their feelings towards the pandemic [22]. Thus, teaching digital skills and the use of ICT for aged populations is considered indispensable to expand the understanding, learning, and abilities needed to bridge the digital divide [23]. Added to this reality is the need to remove barriers associated with technologies. A significant source of frustration is interaction with inadequate software and hardware interfaces [24]. Sometimes, situations such as font size, generous clickable areas, or careful design strategies are enough to avoid giving up on use.

To teach the required digital skill for ICT use during the pandemic, phone call assistance may be a distance and remote solution. O'Connell and colleagues [25] found that the remote training must be divided into steps, detailed and explicit, requesting aged populations to be unequivocal in describing all stages of their technological interaction. In fact, one of the health care policies applied was telemedicine (*i.e.*, the use of ICT to deliver health care). According to Lam and colleagues [26], the adoption of telemedicine as direct video visit to patients relies heavily on the ability or experience with technology, being compromised by the following constraints: (i) difficulty in hearing on the telephone (even with hearing aids); (ii) trouble in speaking or making oneself understood; (iii) possible or probable dementia; (iv) difficulty in seeing well enough to watch television or read a newspaper (even with glasses); (v) not having Internet-enabled devices or not knowing how to use them; or (vi) no email, texting or Internet usage in the last month. If a family member or caregiver cannot facilitate doctor visits, an alternative is a telemedicine by phone or video calls evaluated in four possible scenarios: (i) video visits as aforementioned; (ii) video visits assuming patients who have social support are ready for telemedicine (*i.e.*, having someone at home or at least two individuals in

their social network); (iii) telephone calls with disability criteria for speech difficulties, communication difficulties or dementia and with technology criteria reduced to the absence of any telephone; and (iv) telephone visits assuming patients with social support are ready for telemedicine [26].

3 The Interview Study

This research seeks to understand the perspectives of Universities of the Third Age, Municipalities, among other Institutional Care for Aged Populations on their role to promote communication, socialization, and connectedness of aged populations during the COVID-19 outbreak. To the best of our knowledge, no research has been carried out combining aged populations, digital connection, and the pandemic impact in this context. Therefore, a qualitative exploratory approach was adopted using semi-structured interviews to identify and explore the perspective of those who directly contacted the studied population. Institutions and municipalities from all over the Portuguese territory were recruited, making no distinction in their urban development. Following a literature review, an interview schedule was developed and applied, as will be described in the next sections.

3.1 Selection of Interviewees

Semi-structured interviews were undertaken with representatives of Senior Intuitions¹ (e.g., Universities of the Third Age, Senior Institutes, and Senior Academies), and Portuguese municipalities that develop initiatives for the senior population.

An invitation to participate in the online interview was sent by email to a total of 334 public contacts from all Portuguese Institutions and Municipalities that fit the previous criteria. The qualitative survey instrument was cross-sectional since it was applied during a specific point in time – *i.e.*, from January 20 to May 26, 2021 – and was hosted on the FormsUA platform², therefore, following all the ethical considerations imposed by the Ethics Council of the University of Aveiro and the General Data Protection Regulation (GDPR).

3.2 Characteristics of the Interviewees

A total of 72 representatives were interviewed, of which 51 represent senior institutions, and 21 belong to Portuguese municipalities. The Portuguese reality

¹ The Senior Institutions considered in this study can be defined as spaces dedicated to the occupation of their students' free time, through multiple practical and/or theoretical learning topics, such as informatics, theatre, dancing, singing, and literature. Its target audience is usually older adults aged 50 and over.

² Available at: <http://forms.ua.pt/> (Access date: 30-08-2021). A service offered by the University of Aveiro using the LimeSurvey software – <https://www.limesurvey.org/pt/> (Access date: 30-08-2021).

concerning the development of socioeconomic contexts is quite heterogeneous, with persistence of several inequalities, especially in rural areas and those more distant from large urban centers, which leads to different responses to the COVID-19 outbreak, to the activities to be carried out, to social support, and the use of ICT.

The Portuguese senior institutions are committed to providing learning spaces, deeply characterized by socialization – one of the great motivators for the seniors' participation in learning communities. Supported by the municipalities, some senior institutions develop a series of social, cultural, scientific, technical, recreational, and sportive activities, thus ensuring socialization, active and healthy ageing, and the promotion of physical and mental health while improving the quality of life of aged populations.

Through a wide range of classes (*e.g.*, informatics, languages, history, theatre, dance, music, cooking, and sewing), the institutions are able to perpetuate their values of continued lifelong learning, equality and non-discrimination, and commitment to an active, healthy, and participatory ageing.

As previously mentioned, some municipalities have a preponderant role in promoting and financing senior institutions, thus allowing their work to be preserved. Additionally, these provide psychological support services, teleassistance – which is crucial during social isolation –, and social support to the ones in need.

Data saturation was achieved when no new data has emerged during data analysis and, as such, the authors stopped recruiting participants.

3.3 The Interview Schedule

Participants were invited to share not only their opinion and perception on the impact of the COVID-19 pandemic but also strategies and measures adopted with the aged population, as well as the use of ICT in bringing aged populations together with the services of municipalities, and Universities of the Third Age (*i.e.*, active participation in society and teaching-learning practices).

A schedule of two semi-structured interviews was outlined – one for municipalities, and the other for Universities of the Third Age –, since it ensures that the same topics and content are discussed and collected from each interviewee. This provides not only focus but also some entitlement and adaptability to get the information from the participants while pursuing in-depth information around the topic.

Both interviews began with an introductory acknowledgment and explanation of standard procedures. Then, an ice-breaker question was made about the participants' social work with aged populations. It was followed by one of the main questions of how the pandemics affected their work, with sub-questions related to the means of strengthening communications and relationships, and the adaptation to an online context. Afterwards, the participants were asked about how information and communication technologies, with a focus on social media, would help to meet the entity's mission and proximity to aged populations and contribute to their quality of life. Regarding the interviews with the Universities of the Third Age, there was an extra question – after the presentation of an online community for active and healthy ageing entitled miOne (<https://miOne.altice.pt>) developed within the research project

– relative to its potential or not to encourage the participation of the University of the Third Age’s attendees. All the interviews ended with an acknowledgment statement.

Most of the interviews took place via the FormsUA platform due to the COVID-19 restrictions and were transcribed with written informed consent.

3.4 Analysis Procedures

The semi-structured interviews were transcribed, and the qualitative data were analyzed with NVivo software (*i.e.*, a qualitative data analysis software, QSR International Pty Ltd, Version 2021). Content analysis of the interview scripts were conducted, following inductive coding in which the codes have emerged from text analysis. Two members of the research team read all the data and coded the interviews separately and disagreements were managed through discussions and the consultation of a third member.

Table 1. NVivo Nodes’ Relationships.

Parent Node	Child Node	Grandchild Node
Characterization	Institution	Paid Volunteering
	Municipality	-
Contributions	Classes and Activities	-
	Projects	-
	Social Interaction	-
Pandemic Constraints	Financial	-
	Geographic	-
	Global Shutdown	-
	Social	-
	Technological	-
Barriers	Cognitive Impairments	-
	Content Production	-
	Info exclusion	-
	Lack of Engagement/Dropouts	-
	Technology Aversion	-
	Social Exclusion	Isolation Lockdown
Solutions		Digital Platforms Mail Phone Calls Radio
	Connection	
	Equipment and Material Provision	-
	ICT Learning/Teaching	-

The parent nodes (*i.e.*, codes) were based on each question, whereas the child and grandchild nodes emerged from the answers (*cf.*, Table 1): (i) a ‘Characterization’ node was created to identify institutions that operated on a voluntary or paid basis and municipalities; (ii) the ‘Contributions’ arose from a description of each interviewee; then, (iii) when asking about how the COVID-19 outbreak affected the quotidian, the ‘Pandemic Constraints’ were divided into financial, geographic, global shutdown, social and technological; (iv) the main challenges that each organization faced resulted on the ‘Barriers’ code; whereas (v) the resolutions they found to fight it are, alongside the proximity with the use of ICT, the created ‘Solutions’.

3.5 Ethical Considerations

This study safeguards to follow the Ethics and Deontology Council of the University of Aveiro Ethical Approval (Resolution nr. 12-CED/2019) for the SEDUCE 2.0 project – use of communication and information in the miOne online community by older adults (Project nr. POCI-0145- FEDER-031696). NVivo software was used to code and question data. The participant names used in this study were replaced by a unique code – *e.g.*, P1, P2, P3. Moreover, when answering the interview questions, participants were informed of the data collection purposes and processing conditions.

4 Findings

Throughout the conducted interviews, as already been discussed in the previous section – *cf.*, Analysis Procedures and Table 1 –, five main and structural nodes have been identified – *i.e.*, characterization, contributions, pandemic constraints, barriers, and solutions. These establish the findings’ structure and its sections, in which the main results will be presented and analyzed individually. For contextualization, Table 2 demonstrates by how many participants the main nodes were mentioned and the number of times they were referenced, highlighting the core child nodes.

The node ‘Contributions’ was mentioned by 53 participants and referenced 95 times, with special emphasis on classes and activities (referenced 73 times), with social interaction being referenced 35 times and projects 23 times.

In terms of the pandemic constraints, these were also mentioned by 53 participants and referenced 73 times. Child node shutdown was the most referenced (46 times), followed by social (28 citations), financial (11 citations), technological (6 citations), and geographic (4 citations).

Relative to the node ‘barriers’, 45 participants declared several constraints these are facing, with a focus on Infoexclusion (referenced 35 times), lack of resources (referenced 35 times, with emphasis on the equipment and internet), social exclusion (referenced 27 times), lack of engagement or dropouts (referenced 22 times), technology aversion (referenced 21 times), cognitive impairments (referenced 8 times), and content production (referenced 3 times).

As for solutions, these were the most mentioned and referenced (58 and 148 times respectively). The forms of connection are referenced 136 times, with digital

platforms (85 citations) and phone calls (41 citations) being the most cited. Equipment and material provided is referenced 31 times, followed by ICT (21 citations) and partnerships (7 citations).

Table 2. Main Nodes Mentioned and Referenced.

Nodes	Participants' Mentions	References
Contributions	53	95
Classes and Activities	50	73
Social Interaction	29	35
Pandemic Constraints	53	73
Shutdown	46	46
Social	20	28
Barriers	45	88
Infoexclusion	33	35
Lack of Resources	27	35
Solutions	58	148
Connection	60	136
Equipment and Material Provision	20	31

4.1 Contributions

As noticeable in Table 3, findings suggest that 56% of the participants (n=73) have the classes and activities (*e.g.*, informatics, physical education, and arts classes; and social, cultural, and educational activities, such as lectures, poetry reading, and cooking) as the main contribution of their municipalities (44%, n=11) and senior institutions (58%, n = 62), followed by social interaction (27%, n=35; municipalities – 36%, n=9; senior institutions – 25%, n=26), and projects – which have a wider range, providing multiple services, such as online radio, transportation, delivery of essential goods, and handling the required bureaucracies (18%, n=23; municipalities – 20%, n=5; senior institutions – 17%, n=18), being grounded by the following quotes:

“(...) we have a set of activities/initiatives, aimed at the senior population throughout the calendar year.” – P2

“(...) intends to regularly promote social, cultural, educational and social activities aimed at people over 50.” – P12

“The Municipality (...) uses Social Network to bring together all institutions with these responses (residential structure for the elderly, day center, home support service and social center). In addition to the older adults who are integrated in social responses, the Municipality has invested in a diversified offer in the following areas, health and well-being, culture and leisure, solidarity and in the arts and knowledge.” – P45

"(...) is the University of the Third Age aimed at the population aged 55 and over. The project was born in 2017, and thus, new tools were gained for the aged population, which contributes to active aging, rich in experiences that enhance the achievement of and citizen participation, always with moments of pleasant conviviality." – P66

Table 3. Analysis of Institutions and Municipalities' Contributions.

Child Nodes	Municipalities		Senior Institutions		Total	
	%	N	%	N	%	N
Classes and Activities	44	11	58,49	62	55,73	73
Projects	20	5	16,98	18	17,56	23
Social Interaction	36	9	24,53	26	26,72	35
Total	100	25	100	106	100	131

4.2 Pandemic Constraints

Table 4 refers to the occurrences in the child nodes related to the pandemic constraints. As can be observed, findings suggest senior institutions were highly affected, especially due to the imposed closure of facilities (52%; n=38). Similar observations were recorded in municipalities, as nearly 36% (n=8) were forced to lockdown. Social constraints were also identified in both types of participants (Municipalities – 32%; n=7; and Senior Institutions – 29%; n=21), and financial ones were acknowledged with deeper relevance to the municipalities (23%; n=5).

Table 4. Analysis of Institutions and Municipalities' Pandemic Constraints.

Child Nodes	Municipalities		Senior Institutions		Total	
	%	N	%	N	%	N
Financial	22,73	5	8,22	6	11,58	11
Geographic	4,55	1	4,11	3	4,21	4
Shutdown	36,36	8	52,05	38	48,42	46
Social	31,82	7	28,77	21	29,47	28
Technological	4,55	1	6,85	5	6,32	6
Total	100	22	100	73	100	95

As previously mentioned, financial limitations were one of the main constraints imposed by the COVID-19 outbreak. The following are some illustrative quotes:

“Since March last year [2020], our Municipality has been feeling the consequences of this problem [COVID-19 outbreak], which quickly evolved from a public health crisis to an economic crisis situation” – P52

“Seniors’ pensions are very low and their expenses are increasing.” – P16

Moreover, 46 participants (48,42%) mentioned the need to close their facilities and cease the planned activities:

“With the closure of facilities, we were forced to keep the school in an online format, which is not easy to reach all the students. Only about half adhered and we had to do an exhaustive work to motivate them towards this new medium.” – P06

“Our school was deeply affected, as after a visit to our facilities by the health authorities, they were declared unable to operate due to lack of ventilation, which forced us to stop the activity” – P29

“COVID-19 abruptly changed the entire Municipality's operations regarding human resources, materials, logistics, etc. The entire functioning of the Municipality was thus conditioned. It is important to note that all cultural, recreational and sports activities were practically reduced to zero due to insufficient security measures. Social services were reinforced in order to cover the largest number of people.” – P49

“For our public [older adults], there is the question of affection, of ‘touch’, of fraternization.” – P08

Lastly, social constraints also played an important role in shaping the unfolding of the pandemic crisis. Older adults were among the most negatively impacted due to their potentially more fragile health condition:

“The pandemic has accentuated the population's loneliness and isolation. Confinement out of fear or legal imperatives have forced people to be more alone and further away.” – P22

“The existence of seniors with aggravated levels of loneliness and isolation is registered, which generates negative effects from the psychological, behavioral and physical point of view.” – P24

4.3 Barriers

When analyzing the word cloud of the most frequently mentioned words regarding the barriers perceived by the municipalities and senior institutions – *cf.*, Figure 1 – as can be observed, students, access, technologies, confinement, and platforms are the most important barriers that these organizations are challenged by. Therefore, it can be understood that students access the technological platforms to overcome confinement. Additionally, other important and relevant words to the barriers' panorama also emerge – *i.e.*, activities, solitude, internet, health, communication, and equipment.



Fig. 1. NVivo's Word Cloud of Institutions and Municipalities' Barriers.

In the same vein, Table 5 represents the intersection of the identified barriers' occurrences, and the two types of institutions – *i.e.*, municipalities and senior institutions. As can be observed, there is a barrier with a clear and special impact on the two types of institutions – lack of resources (municipalities – 25%, n=8; and senior institutions – 24%, n=28). Moreover, social exclusion has a preponderant role in municipal barriers (28%, n=9) that is related with the isolation and solitude seen in Figure 1. The interviewees also reported that info exclusion was one of the main barriers, both to municipalities and senior institutions, which suggests poor digital literacy among the aged population and the challenge in having access to technologies, (digital) platforms and equipment (*cf.*, Figure 1). Lastly, lack of engagement or dropouts, and technology aversion, although less significant, also figure as some of the important barriers to staying connected in times of COVID-19.

Table 5. Analysis of Institutions and Municipalities' Barriers.

Child Nodes	Municipalities		Senior Institutions		Total	
	%	N	%	N	%	N
Cognitive Impairments	9,38	3	4,2	5	5,3	8
Content Production	3,12	1	1,68	2	1,99	3
Info exclusion	21,88	7	23,53	28	23,18	35
Lack of Engagement or Dropouts	6,25	2	16,81	20	14,57	22
Lack of Resources	25	8	22,69	27	23,18	35
Social Exclusion	28,12	9	15,13	18	17,88	27
Technology Aversion	6,25	2	15,97	19	13,91	21
Total	100	32	100	119	100	151

Strengthening the results of the presented cross table on the Institutions and Municipalities' barriers – cf., Table 5 – the following quote illustrates the report of age-related cognitive decline:

“The impairment of memory and cognitive processes in the elderly is evident. Memory, who is often undervalued, in the near future will bring many psychological and physical complications to the elderly, as they will unlearn certain skills, making them very slowly ‘forget’ how to walk, talk, and eat.” – P16

Additionally, the lack of resources – whether it is equipment, internet, or people – also presents as a very relevant barrier:

“Older adults don't have the resources to have this communication [that would allow online classes].” – P30

Highly motivated by the lack of the resources, the info exclusion plays an important role in shaping access to information and communication media:

“The assignment is not easy, since many of the students have no grounding knowledge in working with online contexts, much due to the curriculum plan established for computer classes in previous years focusing on the use of communication tools such as Microsoft Office, namely Word and Excel” – P05

Moreover, due to the technology aversion, the use of communication tools is neglected, which, combined with pandemic restrictions, accentuates social exclusion:

“Although most students show some resistance to use digital platforms on a regular and constant basis, these are an important way to communicate and disseminate information” – P49

“The pandemic has accentuated the loneliness and isolation of the population. Confinement out of fear or legal obligation has forced people to be lonelier and further apart.” – P22

4.4 Solutions

While analyzing the word cloud of the participants’ solutions for the encountered barriers (*cf.*, Figure 2), *students* are, once again, the most cited word, alongside *activities*, *technologies*, *community*, *networks*, *Facebook*, *online*, and *support*. Therefore, it can be perceived as students’ technological activities maintain them in the community thanks to the support of online communities like Facebook. Moreover, other forms of connection are also mentioned, such as *social*, *contact*, *telephone*, *information*, *WhatsApp*, and *Zoom*.



Fig. 2. NVivo's Word Cloud of Institutions and Municipalities' Solutions.

Corroborating the results of the word cloud, Table 6 shows a high number of occurrences in the child node connection for municipalities (68%, n=32) and especially for senior institutions (70%, n=104). As previously mentioned, digital platforms and phone calls are the most cited digital platforms, as illustrated in the following quotes:

“It was very useful during these years to teach the subject of computing and mobile technologies, because, today, students already know how to be in this virtual world, so they are not info excluded. We use Zoom, Facebook (...)” – P6

“The answer is to use digital platforms and recording activities to reach out to senior citizens.” – P27

“When presential classes were interrupted, we reinforced the use of digital platforms and tried to keep senior students motivated and involved.” – P50

“We try to use various platforms (email, blog, social networks) in order to reach as many people as possible.” – P50

Furthermore, 20 participants provided equipment and materials to those in need, helping them with basic needs and chores, so that the aged population could continue to be an integrative part of their communities:

“Students who did not have access to the internet, or who did not have a computer, or who found it difficult to get information through these means, were sent the information (cards, reading sheets, work sheets), since the head teachers printed those paper documents, and were going to deliver them directly to the students' homes.” – P2

“(...) creation of a Support Line for the most vulnerable population that allows the delivery of essential goods and medication at home, food support, daily delivery of meals to students during the period in which the institutions were closed, loan of computers with internet access, to all students who do not have the means to access distance learning, among many others. And this strategy involved providing material such as masks, suits, gel, carrying out tests, disinfecting spaces, direct articulation with Public Health and Social Security, among many others.” – P25

“We created a group of volunteers that helps the population to go shopping, pharmacy, and lift retirements' pensions. In collaboration with the council and schools, we take meals at lunch to confined families.” – P43.

Table 6. Analysis of Institutions and Municipalities' Solutions.

Child Nodes	Municipalities		Senior Institutions		Total	
	%	N	%	N	%	N
Connection	68,09	32	70,27	104	69,74	136
Equipment and Material Provision	12,77	6	16,89	25	15,9	31
ICT	10,64	5	10,81	16	10,77	21
Partnerships	8,51	4	2,03	3	3,59	7
Total	100	47	100	148	100	195

5 Discussion

This paper has presented the main contributions of 72 Portuguese Institutions and Municipalities to mitigate the impact of the COVID-19 outbreak on older adults' life

while enabling social connectedness and communication. Overall, even if there are noticeable barriers, it was found more references about contributions and solutions.

As reported, the participants play a crucial role in developing classes and activities to keep the aged population occupied, as well as ensuring that there is the social interaction among them. As found in recent studies, the involvement of the aged population in educational activities can positively affect their cognition, and mental wellbeing, and reduce the risk of social isolation [27]. In that vein, the importance of social connectedness is also highlighted, as its absence can promote an accelerated ageing, poor immune function [28], psychological discomfort [29], and cognitive impairments [30].

Nonetheless, maintaining these activities during the pandemic period proved to be rather challenging. As noted earlier in the Findings chapter, nearly 36% of the municipalities and more than a half of the senior institutions were forced to shutdown. These conditions brought additional challenges, both financially – making it impossible to maintain the infrastructure –, and socially – threatening all the efforts previously made, and reinforcing the importance of social connection. Moreover, the economic crises and their impact that has arisen on families have also been emphasized [2], while reinforcing the important role of senior institutions and municipalities to mitigate its effects.

The participants' responses suggested that students' access to technological platforms in order to overcome confinement could be one of the main perceived barriers that the Portuguese Municipalities and Senior Institutions are challenged by. Following this line of thought, info exclusion is also presented as a key factor in obstructing the achievement of the defined goals and the implementation of the planned activities at a time of pandemic constraints and is strongly characterized by social distancing [11]. Despite the 2021 high numbers of ICT use in 71% for those aged 55 to 64 years old and 48% for people aged 65 and older [19], a digital divide – *i.e.*, a social and global problem that shapes and conditions the access to the opportunities enabled by technology – still persists [31]. Likewise, the inadequacy of technological products to the aged population's needs [32] may also present itself as a technological barrier. Additionally, the lack of resources and social exclusion emphasize the resistance and relevance of using digital platforms.

One of the key findings is the presented solutions, as participants report their perspectives on what could be used to overcome the social distancing measures' negative impact and allow the aged population to stay connected. The role of online communities – like Facebook – is emphasized, as well as the use of telephone contact (both wired phone and mobile), WhatsApp, or Zoom. As previously discussed, the lack of resources to access technological equipment is a reality for the senior population. Therefore, one presented solution is the supply of equipment and materials to those in need, allowing them to continue to be a part of the community. In addition to its possible use in telemedicine [26], as the target audience is already used to it, has a lower learning curve, and requires a smaller technological infrastructure, the telephone contact requires less technological infrastructure and is highly mentioned as a possible solution to overcome the aforementioned constraints.

Lastly, it is necessary to point out that social distancing does not characterize abandonment, therefore, each Municipality and Senior Institution must reflect on and discuss the important strategies for their own context. The aged population can adapt

and may turn the COVID-19 pandemic into an opportunity to learn new things. Searching for new forms of entertainment and online awareness constitutes a valid alternative for promoting quality of life since digital platforms can allow new knowledge acquisition, experiences, and forms of social connection.

6 Conclusions

This research set out to analyze the strategies adopted by Portuguese Universities of the Third Age, Municipalities, among other Institutional Care for Aged Populations to ensure communication and active participation of older adults in society and the role of digital media in that process. Research findings revealed that these institutions played a crucial role in developing classes and activities to keep the aged population occupied, with positive implications cognition, and mental wellbeing, and reduce the risk of social isolation.

The shutdown of these institutions has, however, brought additional challenges, both financially – making it impossible to maintain the infrastructure –, and socially – threatening all the efforts previously made, and reinforcing the importance of social connection.

The use of online communities – like Facebook – is emphasized, as well as the use of telephone contact, WhatsApp, or Zoom to maintain contact and assist in daily living activities. These institutions have relied heavily on telephone contact, which requires less technological infrastructure and is highly mentioned as a possible solution to overcome the constraints.

A limitation of this study is that there was a lack of access of the context in which this support was carried out and, as such, findings are based on the participants' rapport which can be filtered by their perception while transmitting partially the vivid reality. A further study could assess not only the older adults' learning and socialization perspectives, but also the long-term effects of the measures adopted and compare with the period of a new normality post-COVID-19. Thus, regarding future work, a new study comparing the institutions' insights and older adults' opinions should be performed to provide guidelines that support the development of digital competencies and literacy among the aged population. Moreover, the main lessons learned, how to accomplish the goal of connectedness of aged populations, and the solutions found to overcome barriers should be highlighted.

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Appendix – Interview Structure

Goal: This interview aims to understand the impact of COVID-19 on the Universities of the Third Age, Municipalities, and/or Institutions of Care that develop not only activities with aged populations, but also strategies/measures, as well as on the use of Information and Communication Technologies in the teaching-learning practices and social connectedness.

1. Introduction/Standard instructions and procedures

Hello! Firstly, we would like to thank you for your participation in this interview. We are researchers of the SEDUCE 2.0 project – Use of Communication and Information in the miOne online community by senior citizens. You have been invited to share your opinion and vision regarding the impact of COVID-19 on the strategies/measures adopted with aged populations, as well as on the use of Information and Communication Technologies in connecting older adults with institutions. We reinforce that your participation is voluntary and anonymous. Therefore, you have the right to end this interview at any moment, and the anonymity of all data collected is guaranteed.

2. Posed questions

- a. Please indicate your University of the Third Age, Municipality, or Institution of Care for Aged Populations.
- b. Briefly describe the work that has been done in your [University of the Third Age, Municipality, or Institution of Care for Aged Populations], especially with the older people.
- c. How has COVID-19 influenced daily activities in your [University of the Third Age, Municipality, or Institution of Care for Aged Populations]?
- d. In your opinion, how do Information and Communication Technologies help your [University of the Third Age, Municipality, or Institution of Care for Aged Populations] to increase proximity with older adults and contribute the local populations' quality of life?
- e. What challenges is your [University of the Third Age, Municipality, or Institution of Care for Aged Populations] currently experiencing? And what solutions are you looking for to address those challenges?

3. Acknowledgement statement

We have reached the end of this interview. Do you wish to add any topic that has not been addressed? On behalf of the SEDUCE 2.0 team, we would like to thank you for your collaboration.