ITALIAN JOURNAL OF SOCIOLOGY OF EDUCATION
Editor-in-Chief: Silvio Scanagatta | ISSN 2035-4983

Technocare, the Elderly and Disability: a Study of Transformations in Models of Care

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HOW TO CITE

Álvarez, I. Z., Venturiello, M. P., Rodríguez, J. M. (2023). Technocare, the Elderly and Disability: a Study of Transformations in Models of Care. Italian Journal of Sociology of Education, 15(2), 75-94.
DOI: 10.14658/PUPJ-IJSE-2023-2-5

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Technocare, the Elderly and Disability: a Study of Transformations in Models of Care

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Abstract: The increasing care needs of an ageing disabled population and older people who become disabled due to the ageing process itself raises the issue of insufficient care and the need for a social reorganisation of care between the State, families, the market and civil society. Current research on care focuses on perspectives where technology can play an important role. Technology designed to enhance care and self-care helps to promote the participation of older people in society. The authors participated and present a line of research developed in Spain that analyses whether technology is being used as a model that reproduces care practices with a welfare approach or as a phenomenon that facilitates a social model of disability that contributes to greater autonomy of the elderly in carrying out daily activities, self-determination, and where the community context plays a more critical role, as has been recommended by supranational organisations. Educating seniors about digital literacy is important, as is advancing research by collaborating with seniors to co-design technology for care and self-care.

Keywords: Ageing, dependency, self-care, technology

Introduction

The increasing care needs of an ageing disabled population and older people who become disabled due to the ageing process itself raises the issue of insufficient care and the need for a social reorganisation of care between the state, families, the market and civil society. Current research on care is oriented towards perspectives where technology can play an important role. The design of technology that enhances care and self-care helps to promote the participation of older people in society. An ageing population and the high incidence of chronic diseases in old age are significant challenges for many countries worldwide, and Spain is no exception. It is estimated that by 2060, 30% of the population will be over 65 years of age, leading to a massive shortage of care staff for these people and the care of other people with functional diversity in other age groups. Long-term care has been a steadily growing segment of the economy (Digital Future Society, 2021). Against this backdrop, one might ask whether there is an alternative that incorporates technology or, in some cases, robots. Robots will most likely be part of the care innovations of the future. Against this background, we need to adopt an approach that considers what changes need to be made in technology, health and public systems for the care of people with functional diversity and older adults that respects their emotional needs, human interactions and support their daily life.

This article presents a line of research developed in Spain within the framework of a project in which the authors participate. Sustainability of care for dependent persons: Experiences and dilemmas in the design of techno-care (2020-2023)[1], the general objective of which is to find out how technologies can contribute to improving the efficiency of the different aid programmes of the del *Servicio de Atención a la Dependencia (SAAD)* (Dependency Care Service), identify possibilities for the development of public techno-care services that can improve existing services, generate contributions for the design of technological tools that contribute to optimising resources and describe what is understood by best care practices for the different agents and institutions involved, as well as to delve into the dilemmas, resistance and solutions offered by each of the populations analysed in the project.

This study also analyses some results about the potential of techno-care for older people as a facilitating phenomenon of a social model of disability

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[1] Funded by the Junta de Andalucía within the scope of the Andalusian Plan for Research, Development and Innovation (PAIDI 2020) in which the authors participated (PT18-2624). The project involves researchers from the University of Almeria, University of Seville, Pablo Olavide University of Seville, University of Jaen, Carlos III University of Madrid, Flacso Uruguay, Gino Germani Research Institute of Buenos Aires (Argentina).

that contributes to greater autonomy for older people for the performance of daily activities and their participation in society, facilitating their self-determination and where the community can play a more important role as opposed to a model that reproduces care practices with a welfare approach. In order to do so, firstly, the main concepts of the social actors linked to care are set out. Secondly, a reflection is made on the theoretical models of disability that reformulate how to conceive support for the dependent population. Thirdly, the relationships between technologies, care, their potential to support autonomy, and their risks are discussed. Finally, preliminary results are presented on the perceptions of the use of technologies for care and their potential for autonomy through the discourse of professionals related to dependency care and the promotion of autonomy carried out within the framework of the aforementioned research project. Finally, conclusions are presented.

1. Care and support: challenges and social actors

Care is part of everyday life and refers to everything we do to sustain life. The act of caring can be classified into looking after: attending to and recognising a need; securing: identifying the means to meet the need; procuring: the response to the need; and responding: the ability of the care recipient to respond to the actions of the caregiver (Tronto, 1993). This involves material, moral and affective dimensions of care (Martin, 2016).

Studies on care have progressively highlighted its social and economic character and the inequalities that permeate this practice. The responsibility for care has been socially assigned to women, who carry out this work within families without recognition or remuneration. Gender inequalities, which lead to a lack of recognition of care work, make it a space of permanent tension. The patriarchal social order is the material and cultural basis for the invisibilisation of domestic and care work. This form of social organisation divides, on the one hand, the productive sphere as those that have visibility and are public; and, on the other hand, the private reproductive sphere, where home life unfolds and the economic and power disputes that take place there are overshadowed (Aguilar, 2019). In this regard, Hochschild & Machung (2012) have pointed to the double working day of women who sell their labour in the market and at the same time work on domestic and care tasks in their households. Financial contributions to care in households and the public sphere also go unrecognised. The goods and services produced by carers that swell the national gross domestic product are not quantified as such and have been reclaimed by the care economy (Rodríguez, 2012).

Since the 20th century, societies have faced a care crisis (Orozco, 2006) due to changes in the institutions previously responsible for care and the pressure of an increasingly ageing population and dependency situations. The increased need for adults for support in everyday life creates tension in the balance of social demands and offers of care. This situation pushes toward a social reorganisation of care and the active need for the state to develop policies that involve all relevant social actors (Martin & Venturiello, 2021). In addition, tensions between the demands, offers, and responsibilities of care are exacerbated in the face of socio-economic and life crises such as the COVID-19 pandemic.

Gender inequalities, which lead to a lack of recognition of care work, make it a space of permanent tension (Zambrano, 2010). In this framework, it is necessary to review the provision and reception of care, the delimitation of the central actors in their right to care, not to provide care, to be cared for (Pautassi, 2018), and to refuse care in favour of self-care (Venturiello, Gómez & Martín, 2020). It is then a question of analysing how the responsibility for care is distributed and debated in each society, community and State. Razavi (2007) has synthesised provision into the offerings of the care diamond: State, families, market and civil society. The first of the three areas has been studied by describing public care policies, their relationship with welfare states, dependent populations and the gender perspective (Martin, 2016). In the case of families, the overburdening and deterioration of the primary carers of dependent adults, usually women, have been studied in depth. The classical studies on welfare describe the Spanish case as a family-oriented organisation of welfare an care, as a result of the priority given to families (women) in the provision of well-being (Daly and Lewis, 2000; Kantola, 2006; Martínez Buján, 2014). Based on an analysis of public management data, in Spain formal care received at home is complementary to family care, while formal care outside the home is a substitute (Minguela & Muyor, 2019). However, the fractal geometry of care must be reflected by specifying projected models based on the singularity of individual life circumstances and analysing the demands and responses that maintain similar patterns and, therefore, flexibly replicate each situation (Martín Palomo & Gómez Bueno, 2020).

In terms of market supply, the precarious employment and low remuneration of carers, as well as transnational migration from peripheral to central countries to provide this service, have been the main aspects studied (Borgeaud, 2012). The pioneer of this line was Hochschild (2000) referring to the “global care chain” to describe the transnational movements of poor women from developing countries to developed countries to care for members of wealthier families and cover their care deficit. The importance of the presence of civil society in care has been highlighted in recent studies in the context of the care crisis caused by the pandemic, where community and territorial networks functioned as the mainstay of care provision (Martin & Venturiello, 2020).

Care studies have expanded their areas of research on the understanding that in addition to work, it is also a social practice linked to care for the environment and ecology. In this line, the spectrum of enquiry into the elements that constitute the relations of care is broadened towards a post-human perspective that includes objects, technologies and nature (García & Martín, 2021). This work focuses on the conceptual enquiry about the way in which technology is involved in the practice of caring for dependent older adults and people with functional diversity.

Technology as an object of study in the social sciences has presented debates about the supposed objectivity and neutrality of science and technology studies. There was a shift from conceiving scientific objects as matters of fact to matters of concern (Latour, 2004) and towards asking about them as matters of care (Puig, 2017). The notion of actor-network developed by Latour (2004) places technoscience in the realm of relationality, in which they acquire meaning beyond debates about the objectivity or subjectivity of their knowledge. In this line of research, the role of technologies in care has been recovered, for example, by analysing how technologies contribute to or hinder the self-determination of people who require support (Moyà-Köhler & Domènech, 2022). As a counterpoint to the potential use of technologies in care, the danger of their use as technologies of social control has been pointed out. Furthermore, Arroyo, Cano and Finkel (2014) show how new technologies face cultural limitations in ageing population groups. Another limit to their implementation lies in the high costs involved.

In the case of people with functional diversity, technocare is linked both to the possibilities of improving: the support they require for their development and to a challenge regarding their possibility of obtaining us as a way of guaranteeing their autonomy.

2. Models of care in functional diversity: contributions to rethink dependency.

Care studies is a field of research for different scientific disciplines with a solid trajectory. However, the approach is traditionally based on expert knowledge and caregiver narratives. Currently, work incorporating the perspective of cared-for persons is insufficient for the analytical development of care studies. In the field of people with functional diversity (and in a situation of dependency), the construction of care models, at a political and practical level, suffers from an undervaluing of the knowledge founded on the people themselves who *are the object* of care (Muyor & Minguela, 2019).

In this section, we recover the theoretical and analytical perspective produced from the narrative of the social model of disability (Oliver, 1990 and

1996) that complements the political, social and human issues associated with care from the demands of the independent living movement.

Moving from needs to wants and from assistance to rights: Care and theoretical models of disability.

The different conceptions of disability, which are (re)grouped into different models, provide an analytical tool for understanding, organising and explaining ways of examining disability-related reality. The theoretical premises have evolved from the "theory of personal tragedy" (medical-rehabilitative model) to the "theory of social oppression" (social model) (Palacios, 2008).

From the first postulate, care for people with disabilities takes on an eminently welfarist approach that takes as its ideological basis the (supposed) biological vulnerability of people with disabilities. An essential factor in this postulate is that any attempt to diagnose the reality of people with disabilities, their needs and possible responses is based on the individual characteristics of people with disabilities, their abilities and their emotional skills. Thus, disability would essentially impact the physical ability to perform certain activities, difficulties in understanding and restrictions in participation. Thus, well-being depends on the individual disabilities attributed to the person and the capabilities that he or she can achieve in the process of reablement *(normalisation*) (Barton, 1998).

This interpretation is used to argue for a certain degree of care and permanent support for people with functional diversity. In pragmatic terms, this assistance-oriented approach to care assigns an asymmetrical care value to the relationship between the caregiver and the cared-for. The caregiver is perceived as capable, valid, and autonomous, while the cared-for person is perceived as incapable, disabled and/or dependent and in need of care for their subsistence (Guzmán, Toboso & Romañach, 2010; Muyor, 2018).

Furthermore, Martín (2016) warns of the influence of modernity and liberal thought on the collective (re)construction of the notion of autonomy as a reality inherent to human beings. In this sense, the nature of care must contemplate the notion of interdependence, with the understanding that all human beings are dependent at some point in time or some spheres of life.

According to such postulates, the particularity of life is that all people need support in order to live. This paradigm breaks with the idea of unidirectional care and the division between those who exclusively provide care and those who receive it (Martín & Muñoz, 2015).

Transformations in care models tend to give the person with functional diversity maximum control over their own life in accordance with their preferences and possibilities. This trend underpins care that encompasses broader dimensions than traditional physical care tasks. They allude to care strategies that impact the promotion of moral autonomy and not only on the more welfare-related issues of basic and personal care (Artiaga, Martín & Zambrano, 2021). These care relationships would contemplate the issue of supporting the capacity to decide about oneself, to make decisions in those aspects related to their life, and to be in control of their own destiny (Romañach, 2009).

This is where certain crucial aspects of the link between care practices and the social model of disability come together. The analogy between the theory of oppression and care requires, among other things, recovering the social context as an agent involved in the re-conceptualisation of vulnerability. On the one hand, social inequalities and their different expressions contribute significantly to recognising the experience of caring and being cared for. For example, gender, social class, ethnicity, and origin multiply the axes of inequality for carers and cared-for persons. Similarly, economic, social and political contexts significantly impact current responses to caring and being cared for.

Specifically, it is the social context and its expressions of discrimination (lack of accessibility, scarcity of resources, lack of social protection, stereotypes, prejudices, discrimination) that underlies not only the experience of living with a disability but also the recognition of it.

People with functional diversity report that their situation of vulnerability is not caused by their biological constitution but by the systematic violation of their rights. The main focus of care policies is thus on equal rights and not so much on equal capabilities (Muyor, 2019). This (new) structural analysis combines the need for support of people with disabilities with the claim to the right to participate in all economic, political, social, cultural and other forms of community life. However, well-being should not be based on correcting or covering up physical or psychological differences but on claiming inclusive equality that respects diversity (Palacios, 2008). In particular, the focus is on rights, independent living, social participation, equal opportunities, self-determination and empowerment of people with functional diversity. All this implies a different identification of the subject with functional diversity, of the cared-for person and the construction of care policies and practices (Muyor & Minguela, 2019).

The development of these issues raises the need to look more deeply into how care is realised. On the one hand, care practices would tend to be circumscribed within effective and efficient public policies and not to transfer responsibility exclusively to families. Moreover, professional services would act as support instruments to guarantee the will and self-management of people with functional diversity without exercising an institutional paternalism that undermines the possibility of people with functional diversity to choose their own life project. Moreover, from a macro perspective, care policies would address more inclusive conceptions that (re)situate the collective right to care, that is, understanding care as a right of all people, based on free and shared responsibility for the (communal) care of everyday life (Pérez-Orozco, 2012).

Doing so makes a transformation in the ideology and structure of care evident. On the one hand, the need to minimise the therapeutic function of care policies in favour of a more structural vision is manifested. Herein lies the urgency of promoting a change in the design, organisation and ways of living together in society. The removal of barriers (architectural and attitudinal), universal accessibility and design for all constitute (or should constitute) essential axes in articulating care. Similarly, the development of a real system of provision of technical aids and technological support products, which ensure the access and universal use of devices, reexamines the care relationships as they stand as responses to promote the participation of people with functional diversity and their inclusion in the community.

On the other hand, the challenge is to intensify public policies to promote genuine equality in the different protection systems and sub-systems (social, educational, labour, economic, health, etc.) that intersect with the different axes of vulnerability. The projected objective is to establish actions that instrumentalise the social participation of people with functional diversity by reinforcing their role as full citizens.

These dimensions of care not only make visible the weaknesses or strengths of welfare states in implementing (disability) care resources but also examine, question and challenge the socio-cultural hegemony of (female) care. This notion is aligned with the classic attributions of *social care* (Daly & Lewis, 2000) but is complemented, in turn, by other dynamics that strengthen a broader view based on the sustainability of life and the environment (Vega *et al.*, 2018).

3. Some background research on technology, functional diversity and older adults.

Technology and care is a current and developing field of research (Arroyo, Cano & Finkel, 2014). In short, technology is already involved in care in one way or another, as evidenced by several authors (Buse, Martin & Nettleton, 2018)[2]. A previously developed project involving Mª Teresa Martín Palomo & Carmuca Gómez Bueno (Gómez, & Martín, M.ª T., 2020) investigated how the development of new technologies operated by mobile phones by the *Servicio de Ayuda a Domicilio (SAD)* (Home Care Service) assistants could bring technologies closer to the cared-for persons, and be a strategy to advance

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[2] Cited in Gómez, C. and Martín, M.T. (2020), p.235.

towards their professionalisation. One of the main findings showed how technology is already present in even the least equipped or adapted homes and how there is room for technologies to facilitate care work (wheelchairs, articulated beds, lifts, glucometers, oxygen meters, blood pressure monitors), although there is a gap in access and use of these technologies. Some households do not have access to these types of resources (due to a lack of space, capital, and public initiatives in this direction). The issue of inequalities and the incorporation of technological mediation in care has already been studied by some authors (Martin, Myers & Viseu, 2015)

During the pandemic, the use of *digital solutions* increased (apps, mobile phones or tablets with video calls, alarms for medication, telecare and telemedicine, etc.); *Artificial intelligence*: personal assistants (SIRI; ALEXA…), or voice recognition software for people with functional diversity; *Robotics*: science fiction figures, which are projected on the horizon of the possible. *Therapeutic robots and non-anthropomorphic carers* are better accepted as they generate less confusion (Pols & Moser, 2009). Example: Sony's Aibo. Robots in the form of smiling, colourful *dolls or mascots* are gaining ground, but in this case, only accessible, for the time being, to the privileged classes.

Some difficulties in the use of technology include the fact that, in addition to the *cognitive impairment* of some older people, there is also *technophobia* or digital illiteracy in part of a generation that has not used mobile phones, and carers are sometimes assumed to have *digital skills* that are not real (Gómez, C; Martín, M.T.: 2020). In the case of professional carers or home care workers, it can place additional demands on their work that are not appreciated and for which they do not receive training. Despite the initial promise of creating quality jobs, implementing the Dependency Care Service (SAAD) has generated precarious working conditions in a context of crisis (Zambrano et al., 2015) that did not favour home care workers. Currently in Spain there are no training programmes that can improve the digital skills of home care workers.

Anastasia K. Ostrowski belongs to a research group pioneering social robotics and the interaction of people with human robots and working on the design of Personal Robots. She advocates an active role for seniors in this field: "*Currently, one of their interests is focused on collaborating with seniors to co-design social robots through art, interviews, prototyping and other techniques.*"[3] According to their research, older people are receptive to social robots helping with daily activities, ranging from physical assistance (i.e., reaching for or fetching objects), scheduling visits and agendas, reminders or information assistance to socio-emotional support (i.e., positive psychol-

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[3] https://digitalfuturesociety.com/es/qanda/los-robots-seran-nuestros-cuidadores-en-el-futuro-por-la-investigadora-del-mit-media-lab-anastasia-ostrowski/

ogy, facilitating connections). To this end, the robots must connect with care workers, family and/or friends, as requested by the older people involved in designing these robots.

In Ostrowski's opinion, technology does not have to contribute to the dehumanisation of elderly care. The question is how we use technology. Social bots can be used to strengthen connections between people. According to this research group, the proposal is that robots and other anthropomorphic artificial intelligent technologies should be used as another tool in care, not as a replacement or substitution for the connection between people. These technologies need to be tools that facilitate care and connection between human beings.

There are barely any studies on the influence of care robots on community feeling and community building, but it would be interesting to investigate this in relation to the needs of different functional diversities. In one of the studies conducted by Ostrowski's research team, a community of older people in an assisted living facility lived with a social robot for three weeks. The facility's residents felt more socially connected to each other during that time. They engaged with the robot but also taught each other how to use it, introduced the robot to each other and fostered their interpersonal relationships. The robot acted as a "social catalyst," promoting relationships and connections between older people. Researchers and companies continue to develop robots to make older people more autonomous. According to the research team, robots can be designed to collaborate with older people to help them achieve long-term goals, as well as to follow medical treatments, exercise regimes and stay socially connected.

Undoubtedly, technology, including the virtualisation of education, has enabled considerable progress in including people with functional diversity (Perera-Rodrıguez & Morina, 2019; Moriña, 2017) and the participation of older people in society. The COVID-19 pandemic was a major boost to technology as a means of communicating with the outside world. Further research is needed on the potential difficulties and resistances that technology could have for older and/or disabled people. In this sense, experiences that combine research and innovation are essential, as presented by *CERMI* (Spanish Committee of Representatives of People with Disabilities) on numerous occasions. Among their proposals are: the consideration of disability as another dimension of science, research and innovation in Spain under the current Law 14/2011, of June 1, on Science, Technology and Innovation[4] (Article 2 Promote innovation and research applied to the development of environments, products, services and benefits that guarantee the principles

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[4] Law 14/2011, of 1 June, on Science, Technology and Innovation. "BOE" no. 131, of 02/06/2011. https://www.boe.es/boe/dias/2011/06/02/pdfs/BOE-A-2011-9617.pdf

of inclusion, universal accessibility, design for all and independent living in favour of persons with disabilities or a situation of dependency" (CERMI, 2020, p.193). Another proposal made by this group is to develop a specific R&D&I programme on disability, as demanded by the Spanish Strategy on Disability 2012-2020[5], which is the document that sets the course for public policies on disability in Spain and which is deployed within the framework of the European Strategy 2020: "Promote the reinforcement of R&D&I on disability in the Spanish Innovation Strategy through specific programmes." Likewise, to disseminate knowledge, the creation of a permanent and updated repository of R&D&I projects related to disability in the university system is proposed, which in turn has been promoted by Law 14/2011 of June 1 on Science, Technology and Innovation (Art.37). (CERMI, 2020, p.195-196).

An example of the importance of making visible and disseminating research on how technology can improve the lives of people with functional diversity is the scientific dissemination project *'Capaces de Comunicar'* (Able to Communicate)[6], whose objective is to make visible and disseminate research and technology in the field of technology-assisted augmentative and alternative communication. The aim is to show how, through technology and an appropriate implementation methodology, it is possible to give a voice to those who cannot communicate through oral language. The close relationship between Pablo de Olavide University in Seville and CERMI has made this project possible[7].

All this raises questions about whether technologies will dehumanise care, whether technology will be used for specific tasks (the more repetitive and tiring), or the more emotional ones. It remains to be seen how the role of technologies in relational, moral and emotional aspects is perceived among the populations involved. On the other hand, technologies can mediate by simplifying or increasing the work of those who provide daily care in Home Care Services *(SAD).*

4. The discourse of professionals on technocare. Methodology and Results.

The following are the initial findings of the interviews conducted in the framework of the project "*Sustainability of care for dependent persons: experiences and dilemmas in the design of techno-care*" in which the authors

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[5] *Spanish Disability Strategy 2012-2020* Available at: https://www.mscbs.gob.es/ssi/discapacidad/docs/estrategia_espanola_discapacidad_2012_2020.pdf

[6] With the collaboration of the Spanish Foundation for Science and Technology - Ministry of Science and Innovation and AlfaSAAC, CERMI Andalucía, ASPACE Sevilla and *Fundación Romper Barreras*

[7] https://www.upo.es/investiga/capacesdecomunicar/

participated (PT18-2624). The project aimed to analyse the discourses of older people in need of care in everyday life and who receive some kind of benefit within the SAAD; relatives of dependent adults who do and do not receive benefits within the SAAD; and professionals related to dependency care and the promotion of autonomy: managers of care facilities for adults with day-to-day care needs (managers of residential homes and day centres, social workers) and key informants such as social protection management professionals (politicians, managers, heads of companies providing services in the field of care); paid carers in homes, day centres and residential homes.

This article the authors focuses on professionals' discourses on dependency care and promoting autonomy through technology and its learning, specifically on whether technology is being used to support the autonomy of older people and the role of the community in this. Thirteen semi-structured interviews were analysed.[8] These were carried out with professionals in the field of care for dependent adults and promotion of autonomy, managers of care centres for adults with daily care needs, clinical and nursing assistants, workers of the Home Care Service (SAD), key informants from a total sample of 18 people interviewed with this profile and 24 interviews carried out with participants with different profiles and, consequently, with discourses that were not of interest to this current research, such as the discourse of paid caregivers in homes, family members and users. Fieldwork began in February 2021, in Andalusia, but two interviews were also conducted in other Spanish cities due to the profile of some of the interviewees and their link with the aim of this research.

Interviews were conducted when the COVID-19 pandemic was coming to an end in Spain by researchers of the project who also resided in Spain. This situation is of interest because it was possible to assess the contribution made by technology to the care and self-care of the elderly. Currently, researchers are continuing to explore other means of analysis regarding the objectives of the project.

Interviews were analysed through an iterative coding process, in which the emerging concepts and ideas were grouped together into larger codes and recoded into central themes.

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[8] *Key informants:* Psycologist Elderly Care Home (E1), Almería; Techician Fundación Matia (E9), Bilbao; Independent Consultant (E10), Bilbao; Care Coordnator Home Care Services *(SAD)* (E11), Granada; Social Educator, Residential Facility (E18); Psyco-Health psychologist Public residential facility (E20) Almería; Researcher Complutense University (E24) Madrid; Manager of the cooperative *Abierto hasta el Amanecer* (E22) Madrid; Other professionals, Cooperativa A3 calles Cuidados en territorio (E17) Madrid; *Nursing assistants and Home Care Service (SAD) in collective establishments*: CLECE SAD assistant (E2) Assistant in residential facility and hospital (E12) Malaga; Assistant in residential facility (E13) Malaga; Assistant in residential facility and hospital (E19) Granada.

The use of technology and the potential of robotics

Technology is something that is seen as positive for our future as a society, “With technology, we contribute something to improve people’s daily lives” (E10); “There was a user who was there because of a very serious case of a brain tumour, she was assisted when I came in, she could still manage on her own and could drive a wheelchair, go forward and backward, turn in a circle, turn round and so on” (E18).

Technology, particularly wireless and mobile phones, all make communicating with family and friends easier as long as they are able to do so. “Almost all the grandparents have mobile phones…they called their family, they made video calls… […] (E12); Families have made a kind of family WhatsApp” (E13). This has led to greater participation of older people in society. The interviewees highlighted the role that their use has played in care homes, especially since Covid

> “Video calls did not exist at the beginning. There were lots and lots of calls. We always had our phones in our pockets, and we took them to the person we wanted to talk to” (E18). “Cordless phones**,** mobile phones have given older people much autonomy: “It gives people the confidence to be on their own (…) I think technology is very welcome, I mean, it’s essential” (E24).

Computers and spaces set up in some residences for internet use have also facilitated autonomous use of the internet by the elderly “one person wanted to see their house, so they went to Google Maps and saw the house (…). Another man wrote about his beliefs about the benefits of food. Each person uses the internet in a different way” (E1).

Although robotics cannot replace some manual tasks “for dealing with the elderly, technology cannot be there; it is personal” (E19); it can help older people connect to the outside world and feel less lonely.

> “A grandmother came in, and her children brought her an Alexa because she did not want to leave the room (…) so one day, talking to the children, they suggested: “What if I bring my mother an Alexa?” And then she, well, she learned, didn’t she? It’s a way of keeping her company, in inverted commas, isn’t it?” (E18); “when her daughter was in the shop, maybe the robot could keep her company” (E2).

In the opinion of those interviewed, it is a world that should be explored to see the possibilities it could offer, not only for the elderly, but even to free up tasks for carers that could lead to more time being spent with grandparents: “I have seen how a care home here in Almeria bought a robot as a pilot study (…) so as not to be left behind, if we do not include anything, we continue with the same assistance of 50 years ago, and it is not normal”(E20).

> “In care, I think robots could help with cleaning (...), a robot with hands that could reach out and pull down the curtains to places where the user cannot reach, because if the elderly person were to climb a ladder [...] and have an accident, it could be dangerous (...) it could pull the curtains, wash them, hang them, that kind of thing would be great (...) I could also cook (...) cut for the users who cannot see (...) these things could be done” (E11); “in the care home there are no cleaning robots, but that would take a lot of work away from the cleaners, and maybe they could dedicate a “little bit” more to be with the grandparents, couldn’t they?” (E18)

Older people’s learning achievements and the role of the community

Older people have had to learn late to use technology though it has not always been easy. However, the benefits gained, such as the possibility of communicating with family and close friends and gaining autonomy through the internet and mobile phones, have been an important motivation, although using other technology, such as tablets, has been more challenging. The support and motivation of caregivers for older people and their families to use the technologies have been significant.

> “We have had to adapt a little to everything and technologies. (...) in particular with the forms of communication with families (...) before there were not so many older people with mobile phones and now I have managed to get those who can handle them and those who need a little help to carry their mobiles. Then, the family is called, and I say, “look, you can buy them a mobile (...) if we see that it can be positive, then we need to explain once, twice, three times and as many times as necessary” (E20).

> “They are getting used to seeing screens, they are getting used to wearing wireless headphones, they are getting used to not having their mobile phones in their ears (...), and when they talk using only headphones, everyone finds walking difficult. More than touching computers, not having a mobile phone in their hand and walking around is difficult for them, but once they get used to it, they say, “can you put it on, referring to the phone?””(E20).

> “Some have gotten used to mobile phones, though not so much with tablets. If you give it to them, well, if you don’t give it to them, they sometimes say, ‘When are you going to put on “the what’s it called”? They have discovered that they can see their own things through the networks and that, in an instance, they can see many things (...) the affection you give them will depend on how they are encouraged to use this technology”. (E20)

Technology can also be helpful for people with functional diversity, but it must be adapted to their singularities and needs. Once again, the support of caregivers has been crucial:

> "We have a user who is blind, and he has a very large mobile phone, so he can see the keys and talk to his children (...) if the assistant does not put the menu exactly where it should be, Juan gets lost, he cannot call anyone at all" (E11); "look, before when you went blind, you put on your huge glasses, and now after your operation, you put your lens on and you can live again. As I told you, I have headphones adapted to different people, but people who hear well wear wireless headphones, the tiny ones (...) people who don't have problems use Bluetooth. You can go to the bathroom and keep talking. They should have their privacy, their freedom, and this is being given to them little by little, but it is difficult". (E20) "I put his battery in, I put his hearing aid in." (E2)
>
> "You can't just give a person with a visual impairment a tablet; you must adapt it to individual needs (...). The pandemic took away all their rights because if you didn't look after them, they were annulled, you know? Society and the pandemic have annulled the elderly. It's as if they don't belong to society and the community, here we have made them belong because they do belong"(E20).

Public initiatives that support the use of technology are also valued "*in terms of support products, new technologies have also come out (...) aside from the fact that they are much more expensive, they are not covered by social security (E20)".* Sometimes some support initiatives were promoted during the Covid pandemic**:**

> "We saw that Madrid City Council was renting support instruments to private homes, at a very low price, right?" (E22); Madrid City Council had a training offer for elderly care homes. Older people could send a video and upload it (...) there was a specific channel for this leisure offer, my mother also learned how to make video calls with WhatsApp" (E9).

Support from some initiatives such as the Matía Foundation[9], or cooperatives such as Abierto hasta el Amanecer or A3 CALLES cuidados en territorio,[10] propose using technology as a framework so older people can lead a dignified and as autonomous life as possible.

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[9] Private non-profit foundation, responsible for providing services to residential centres and centres for the elderly in the field of health, social services and disability under a comprehensive and person-centred model based on the principles of autonomy, dignity and personalisation. "

[10] The A3 CALLES Cuidados en Territorio cooperative, driven by neighbours and organisations in Vallecas, Madrid, promoted by Abierto hasta el Amanecer and MARES Madrid, aims to promote care in a disadvantaged area of Madrid where care workers can work in good

> “ That an elderly person, because they need to enter a care home, who needs care, does not have a standardised life as in an ordinary house, that they do not lose control of his life…and can continue doing things that have meaning for them (…), if technology can help them, then go ahead” [E9]; “technology is needed as an instrument of social life and at the level of communication” (E17).

The *Abierto hasta el Amanecer* cooperative also proposes technological designs to make older people more autonomous. One of their initiatives was”Mundo Abuelo” (Grandfather World), which, with the help of a 3D printer, aims to create things that make daily life easier “they are very small spoon things that are easier to pick up and can twist so that you don’t have to” (E22).

Conclusions

In this article, we have established some links, possibilities and tensions between care, technologies and functional diversity in older adults by retrieving specialised literature and key informant interviews. We are facing a social crisis in the provision, demand, recognition and accountability of care, exacerbated by the Covid-19 pandemic, where technologies play a key role. According to the findings, digital literacy education for older people is essential to support their autonomy. In this sense, digital education has to be supported by the whole society, caregivers and public initiatives. This proposal coincides with a social model of disability that contributes to greater autonomy of older people to carry out daily activities, to decide for themselves, and where the community context plays a more critical role, as has been recommended by supranational organisations.

These stimulation and lifelong learning initiatives promote active ageing and energise care. People with functional diversity and older adults encounter specific care needs. When care is developed congruently with the social model of disability, it emphasises autonomy and promotes independent living. However, it should be noted that using certain technologies increases the implicit risk of control over individuals.

The figure of the personal assistant, promoted by the SAAD, seeks to overcome the notion of the carer, overriding the agency of the person receiving support. As a reinforcement of this figure, it is worth investigating further what technologies foster the autonomy and self-determination of older people. Research should also be carried out on the different needs and demands of older adults and people with functional diversity, as well as on the existence of technologies for care in homes and collective establishments

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conditions and receive care in a context of proximity.

(nursing homes and hospitals). Fostering autonomous and community-based ageing also requires advancing research in collaboration with older people to co-design technology for care and self-care.

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