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Research Article

'*Everyone is a winner, help is just a push of a button away...*': The Telecare Plus service in Malta

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Abstract. This paper reports on a research study on the role of assistive technologies in later life. Research questions included what is the impact of assistive technologies on the quality of life of older service-users, and to what extent does assistive technology lead to an improved quality of life for subscribers and informal carers? The chosen method of enquiry was a case-study of the Telecare Plus service in Malta. A total of 26 semi-structured interviews were held with a convenience sample of 26 people aged 60-plus about their use and experience of this particular telecare system. The Telecare Plus service was found to contribute positively to subscribers' levels of emotional and physical wellbeing, interpersonal relations and personal development, as well as towards the quality of life of informal carers. However, research also highlighted a range of challenges that stood in the way of increased adoption rates of the Telecare Plus service by older people. The fact that the field of assistive technologies in Malta lacks efficient and clear business models constitutes another barrier towards the take up of such services.

1 Introduction

All over the world, governments are facing the multi-dimensional consequences of an ageing population. Contemporary social and political agendas are peppered with issues such as older people's care, healthy ageing, and age-friendly housing - amongst others. However, concerns about the most cost-effective ways to provide social and health care services are also being addressed keenly. It is within such an emergent framework that policies promoting assistive technology have emerged. From humble beginnings in the late 1940s, when some sheltered housing tenants in the United Kingdom had the facility to ring a bell in a warden's home, nowadays assistive technologies have revolutionised the delivery of health and social care to older people, enabling them to live healthier, safer and more independent lives.

Throughout this article, 'assistive technology' is defined as "any device or system that allows an individual to perform a task that they would otherwise be unable to do, or increases the ease and safety with which the task can be performed" (Cowan and Turner-Smith, cited in McCreadie and Tinker (2005)). In other words, assistive technology refers to any item, or piece of equipment, that is used to increase, maintain or improve the functional capabilities of individuals and independence of people with cognitive, physical, or communication difficulties. Although the dominant stereotypical view is that older persons are unable to master new technological advances, and are apathetic to how technology can assist them in achieving higher levels of active and successful lifestyles, the available literature suggests the contrary (Sixsmith & Gutman, 2013). Indeed, there is no shortage of literature on how assistive technologies - ranging from community alarms to fall equipment - have been mastered by relatively frail and vulnerable older people to help them stay independent and in their homes for as long as possible (Mann, 2005). Assistive technologies also enable healthcare professionals to manage data in order to monitor various chronic conditions associated with old age, as well as to deliver services beyond the confines of health and care institutions,whilst also facilitating effective responses to critical events (Sixsmith & Gutman, 2013).

Various literature has recognised the role and contribution of assistive technology on the quality of lives of older persons (Horner, Soar & Krich, 2009). Few studies, however, presented views or reactions of potential users of telecare services, and how this assistive technology is used and experienced (Percival & Hanson, 2006).

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The research reported herein addresses such a shortcoming by addressing questions such as: what is the impact of assistive technologies on the quality of life of older service-users? to what extent does assistive technology lead to improved quality of life, maintenance of ability to remain at home, reduced burden placed on carers; and improved support for people with long-term health conditions? The chosen method of enquiry was to undertake a case-study of the Telecare Plus service in Malta, by conducting semi-structured interviews through the telephone with a convenience sample of 26 people aged 60-plus that queried their use and experience of this particular telecare system[1]. Findings generated much needed knowledge and understanding about both the potential benefits and possible contra-indications of the Telecare Plus service towards the quality of life of older users.

2 Assistive technologies and older persons

In the realm of later life, assistive technology contributes to the maintenance of human dignity, in the face of the fact that as people get older they often experience decreased financial capacity resulting from increased frailty and/or cognitive limitations. The scope of assistive technology in later life embodies a 'social model' of disability, which acknowledges that older persons' disability ascends from the interface between their physical/mental capacities and the environment, especially their living environments (McCreadie & Tinker, 2005). Assistive technologies offer assistance in the form of a range of equipment that boost the living environment, and thus, prolong older people's ability to function commendably in the face of increasing dependency levels. As a result, the application of assistive technologies aims to (i) enable those who wish to age in their own residences by maintaining independence, extending capability and productivity, and permitting more informed choices; (ii) aid older people who reside in care facilities and their formal/informal carers by facilitating communication patterns, and improving the monitoring and treatment of conditions; (iii) support families in the provision of the assistance and care that are needed by older persons, as well as to facilitate their roles as part of the holistic care team; and (iv), foster innovations that are a response to 'clinical, social, or personal need' (Horner et al., 2009).

[1]The Maltese archipelago is a European Union Member State. It consists of three islands - Comino, Gozo and Malta, 93 kilometres south of Sicily and 290 kilometres north of Libya. Comino has a permanent population of just 3, and with Gozo having a population of 31,143 persons, this leaves Malta as the major island of this archipelago state with 384,912 residents (Census 2011 data) (National Statistics Office, 2014a).

Common examples of assistive technologies generally used by older persons include telecare, smart toilets, wearable technologies, and smart homes. Telecare, as discussed in more detail in the subsequent section, includes a telephone alarm and pendant at its most basic, and wireless devices that measure home safety features and personal medical history at the most complex. Smart toilets are sites that conduct telehealth consultation, with some even equipped with devices for blood pressure and pathology tests on wastes. Wearable technology consists of implanted devices such as heart pacemakers and artificial joints, and sensors embedded in a vest that measure cardio-respiratory and motion signals. A smart home is a residence equipped with technology that facilitates monitoring of residents aiming to improve quality of life and physical independence other than to be a monitor of one's health status. Herein, the technology becomes an element of the residential infrastructure and its performance does not rely on residents receiving training to operate it (Frisardi & Imbimbo, 2011).

Assistive technology promises to taper the break between individuals' capacity and their environment, and hence, make it easier for people to remain in their prevailing housing. Studies of impacts and outcomes of assistive technologies on the quality of life of older persons outline positive benefits in terms of quality of life, safety and ease of performing everyday tasks (Barlow, Singh, Bayer & Curry, 2007). In one particular study, users particularly valued the independence given to them by automatic showers, stair-lifts and downstairs toilets - as well as preventive benefits, which are likely to result in reduced demands on health and social care services and reduced admissions to hospital and other communal care settings (Gramstad, Storli & Hamran, 2012). Assistive technologies also benefit persons with dementia (even those experiencing advanced stages of the disease) - functioning to prevent, or at least delay, admission to residential care for many people, whilst also providing many carers with the reassurance, support and peace-of-mind to continue in this capacity (Agree & Freedman, 2011). Carers appreciate being able to share the caring duties, especially at night if the person for whom they are caring is prone to wandering when the carer would normally be asleep. However, the degree to which assistive technologies can succeed in reaching such a goal depends on older persons' willingness to use related equipment, something that in turn hinges on the needs that people perceive, among which safety and the perceived usefulness of assistive technologies may be the most important.

3 Telecare

'Telecare' describes any service that brings health and social care directly to a user, generally in their own homes, and is supported by information and communication technology. It is considered to be an innovative system for the delivery of health and care services that cuts across traditional domains of housing. An oft-cited definition states that 'telecare is the remote or enhanced delivery of health and social services to people in their own home by means of telecommunications and computerised systems" (Scottish Government, 2009). Hence, "equipment and detectors that provide continuous, automatic and remote monitoring of care needs, emergencies and lifestyle changes, using information and communication technology... to trigger human responses, or shut down equipment to prevent hazards" (Scottish Government, 2009). In most cases, data is collected through sensors, fed into a smart residential hub and sent electronically to a customer call centre.

In its course of development, there have been four major generations of Telecare systems (Brownsell, 2003). The first generation consisted of community alarms; simple technical systems that have no embedded intelligence, and are entirely reliant on the user activating a call for help. The second generation has all the features of the first generation but also includes some level of intelligence either locally in the home or dispersed throughout the system (table 1). For example, sensors might be positioned both on the user and in the home to detect alert situations and autonomously initiate a call for assistance if required. Hence, second generation telecare systems are proactive.

Of course, it is unlikely that any user would need all the components, so a range is available so that the most appropriate can be chosen or prescribed. The home becomes a safer environment in terms of appliances used and detection of emergency situations, such as falls, fire or the presence of intruders. As needs change over time, such as following early discharge from hospital, new components can be introduced and subscribed to. Overall, the second generation provides greater support and monitoring in a way that addresses the particular needs of service users.

The third generation adds further support capabilities such as life-style monitoring, as well as contributing to an improvement in the user's quality of life by supporting other tele-services such as banking, shopping, interactive exercise, medical diagnosis, and interaction with other older people through teleconferencing and video conferencing (table 2). Tasks that were previously carried out by staff but did not require contact with users are taken over by the system. This therefore enables staff to spend more time with users and to provide a more caring environment. Improvements in medical monitoring will enable further parameters to be measured, while for some users continuous 24-hour medical monitoring will even be possible.

Finally, an emergent fourth generation involves the use of Internet to deliver a vast range of telecare services that overlap and integrate with other assistive technologies (table 3). Whilst the emphasis of the previous three generations was to monitor users and detect emergency situations, the fourth generation seeks to improve the system for both the user and provider. For instance, when service users are equipped with implanted sensors under the skin which communicate to an intelligent hub, fourth generation equipment provides health care professionals with ongoing monitoring and automatic assessment. Users can be formally assessed after the system has indicated that intervention would be beneficial. This allows resources to be effectively targeted, whilst also allowing for a preventive system both in terms of the users' health and their daily living.

Academia is only now beginning to attend to the views and aspirations of prospective recipients of telecare services, as well as conducting critical evaluations of telecare packages. As one may expect, there is immense enthusiasm and excitement accompanying accounts of telecare's potential usefulness, as a means of supplying care services in a cost effective manner, given the resource inadequacies of formal support services. The consensus in contemporary research is that telecare systems have the potential to increase independence for older people, support the delivery of more efficient services, and control expenditure on care which is projected to increase massively in coming decades. The United Kingdom government, for instance, has invested significantly in telecare development and delivery, and has asserted that telecare could support older people to remain at home, reduce hospital admissions, improve quality of life, address workforce issues, cope with increasing demand, and save money (Bowes & McColgan, 2013). In many respects, telecare was found to support older people to realise their own goals, facilitating their control over how they spent their time, and their own determined efforts to retain independence. In terms of social participation and active citizenship, telecare provided support to remain in one's own home, hence providing opportunities to enjoy social interactions of people's own choosing.

However, research has also questioned the capacity of telecare systems – thus, tempering the optimism of policy makers. For example, Percival and Hanson (2006) - drawing on a series of focus groups involving service providers, older people and family caregivers - identified concerns about the possibility for telecare to reduce human contact and thus increase isolation. Magnusson and Hanson (2003) identified complex ethical issues re-

Table 1: Key features of second generation telecare systems. *Source*: Brownsell (2003).

Main features	Description
Fall detection	Detect a fall and automatically instigate a call for assistance
Fire detection	Detect the presence of fire and inform user to contact centre
Gas detection	Monitor levels of gas and keep the user informed as necessary
Water detection	Suspend water supply if bath, shower or sink overflow
Incontinence monitoring	To indicate when incontinence pads need replacing
Security	Record arriving carers and disallow unauthorised access
Drug dispenser	Dispense drugs when required and remind user
Medical monitoring	Measure medical characteristics and facilitate call for assistance

Table 2: Key features of third generation telecare systems. *Source*: Brownsell (2003).

Main features	Description
Security	Highly developed burglar alarms / automatic recognition of client
Weight detection	Measures the client's weight and outputs monthly charts
Drug dispenser	Enables prescription reminders and remote analysis of medication
Medical band	Provides 24-hour continuous medical monitoring
Distance support	Communication with medical centre and allows call for assistance
User control	Provides verbal communication with the home-based system
Healthy ageing	Provides remote physiotherapy and exercise sessions
Pharmacist	Enables paperless prescription / delivery of prescribed medicine

Table 3: Key features of fourth generation telecare systems. *Source*: Brownsell (2003).

Main features	Description
Water detection	Monitoring the washing habits of the user
General assistance	Mechanical assistance with cleaning / retrieving items from floor
Implants	Implanting sensors measuring vital signs 24-hours a day

garding telecare use, including its impact on complex family relationships, such as care partnerships in which care is coproduced. Similarly, Fisk (2003) highlighted how some aspects of telecare are more focused on surveillance and monitoring than on promoting independence and choice, raising important ethical issues. Other research found that telecare service did not mitigate against ageist experiences, and service users still faced issues of ageism in many of the communities in which they lived (May, Mort, Williams, Mair & Gask, 2003). In other words, telecare provided older people with some protection from acts of age discrimination but did not address them. As Dant (2006) suggested, the interactions of technical innovations with human relations must be a central concern for future evaluations of telecare. The use of the citizenship lens in evaluating telecare is important for focusing attention on the wishes of older people themselves and draws attention away from the service-led assessment of effectiveness.

In a study that explored the extent to which older people, carers, and professionals consider telecare to be a valuable/potentially valuable service, researchers found that service users draw attention to positive aspects of telecare (Bowes & McColgan, 2013). However, data also uncovered concerns relating to privacy and surveillance, and issues that highlight the interplay between social citizenship and individual freedom, that merit greater attentiveness (Bowes & McColgan, 2013). Although most carers made positive statements about the depth of information that lifestyle monitoring and devices such as wandering alerts can generate, and the likely increased knowledge they would subsequently have about a person's risk levels at home, there was a general view that the data generated in respect of each individual has to be subject to strict guidelines of confidentiality. In particular, participants raised the spectre of commercial companies gaining lifestyle data and using this to direct marketing strategies to sell aids or adaptations. The importance of potential telecare service users maintaining and strengthening personal contact was also highlighted, usually by way of proclaiming that telecare should not 'take the place of face to face contact', thereby reducing

even more a person's connection with a social world. In this respect, researchers urge policy makers to promote a holistic provision for Telecare services, one that allows service users to choose their preferred service and for that service to be tailored to meet their changing needs.

4 The empirical universe

The second half of the 20th Century witnessed unique demographic changes. Declining fertility rates and mortality levels, and major improvements in life expectancies at birth, had far-reaching effects on global population trends, to the extent that the present epoch has been referred to as the 'age of ageing' (Magnus, 2008). Malta is no exception to such trends. Figures based on the 2011 Census indicate that, at end of 2013, 24.6 per cent of the total Maltese population, or 105,068 persons, were aged 60-plus (National Statistics Office, 2014b). The number of persons aged 65-plus reached 76,024 or almost 18 per cent of the population. The sex ratios for cohorts aged 65-plus and 80-plus numbered 79 and 55 respectively. Amongst cohorts aged 90-plus, the number of older women was double that of men. Confirming its belief that the institutionalisation of older persons in residential and nursing homes should only be a last resort, the Government coordinates a number of community services targeting older persons to enable them to live independently for as long as possible. These include a card entitling its holder to obtain rebates and concessions, handyman services, meals on wheels, home help services, incontinence services that supply heavily subsidized diapers, telephone rebates to low income elders, day centres, respite centres, and night shelters - in addition to residential and nursing care homes (Parliamentary Secretariat for Rights of Persons with Disability and Active Ageing, 2013).

The Telecare Plus service owes its origins to the 'Telecare' service which was established in 1991 as an emergency telephone service targeting older persons and others with special needs. At the end of 2012, the total number of installations stood at 9,049 - with teleoperators handling some 100,000 calls every six months (Times of Malta, 2014). The aim of the Telecare service was to help older persons to continue living in their own homes for as long as possible, providing a 24- hour peace of mind not only to older persons in their own homes, but also reassurance to family members and carers. The client was equipped with a pendant with an alarm system connected to the telecare centre. In case of an emergency the client would press the button that is found on the telecare set, or the button on the pendant, which was to be worn indoors, and kept within reach. Telephone operators would make contact with family members - or doctors, health centres, and ambulances - in accordance with the client's needs. Research conducted by Cutajar (2009) reported that subscribers to Telecare applied for this service because they were afraid that something would happen to them while they were alone at home, believing that if there is an emergency the Telecare service would bring a quicker response than if they were to use the normal telephone service. Clients were generally positive about the service, reporting that it was very supportive and efficient, and it put their mind at rest. As regards whether the Telecare service should be improved, clients suggested that the service would be beneficial if instead of working with electricity it would work on batteries, so that it would not stop working if electricity is cut off, whilst others suggested that they would be better served if they could speak through the pendant instead of having to reach the equipment in an emergency. Some also proposed that it would be much more beneficial if the service could be used outside the house within a certain distance.

The Telecare Plus service was launched in November 2013, offering valuable add-ons to the previous Telecare system such as pill dispensers, and flood and gas detectors. The pendant can be upgraded to a 'smart pendant' which also acts as a fall detector, intruder alarm, and medication reminder. It is currently planned that this smart platform will be upgraded in the future to build up medical profiles of the person, who will be able to submit their blood pressure, diabetes or even peak flow, which will then trigger alerts to medical staff when they are outside the upper or lower limit for that particular patient. Eligible persons who can apply for such a service include older couples/persons living alone, aged sixty years and over; persons with disability and those with special needs; and persons of any age who are troubled by chronic systemic illnesses and who are living alone and who are not gainfully occupied. The Telecare Service is subsidised by state funds. No administrative fees are incurred in applying for this service. However, if the applicant is not (i) 60 years or over, (ii) in possession of the pink form, (iii) living totally alone or with two or more elderly persons, he/she must pay the Telecare Plus rental fee, which is € 4 a month. As at May 2014, the number of all Telecare clients numbered 8,952: 56 clients (Telecare and Carelink), 53 clients (Carelink), 806 (Telecare Plus), and 8,037 (Telecare) (Department for the Elderly and Community Care, unpublished statistics). Whilst 29.7 per cent of clients were male, as much as 69.7 per cent were female - 0.6 per cent of clients were organisations. As regards living arrangements, 17.1 per cent of clients were couples living alone, 2.3 per cent were couples living with others, 69.5 per cent were single persons living alone, and 11.1 per cent were single persons living with others.

5 Research design

The study reported herein aimed to shed light on the impact of Telecare Plus subscription on Maltese residents aged 60-plus, seeking to uncover the extent that this assistive technology contributes to their quality of life, and hence, its role in enabling them to 'age-in-place'. The term 'quality of life' is an umbrella conceptualisation that refers to wellbeing across various domains. In principle, quality of life includes both subjective and objective components, is based on individual needs, and is composed of multidimensional constructs influenced by relationship and environmental factors (Agree & Freedman, 2011). An oft-cited definition of the term 'quality of life' is that promoted by the World Health Organization (1997), as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". The objectives of the case-study included the examination of the extent that the Telecare Plus service functions to improving - or at least maintaining - service users' emotional wellbeing, interpersonal relations, material wellbeing, personal development, physical wellbeing, self-determination, social inclusion, and human rights.

The case study adopted a qualitative methodology which, in essence, "is concerned with how ordinary people manage their practical affairs in everyday life, or how they get things done", constituting a "systematic analysis of socially meaningful action through the direct detailed observation of people in natural settings in order to arrive at understandings and interpretations of how people create and maintain their social worlds" (Neuman, 2002). Data collection was conducted by means of semi-structured interviews, and also via researcher's observation of group activities and research notes, with the purpose of achieving triangulation. In semi-structured interviews, the interviewer is normally required to ask specific open-ended questions but is free to probe beyond them if necessary with the interview developing as a joint product of what the interviewees and interviewers talk about with each other. Therefore, semi-structured interviews contain the advantages of both standardised and non-standardised interviews such as flexibility, control of the interview situation, and collection of supplementary information (Neuman, 2002).

Informants for the semi- structured interviews were selected through the process of non-probability sampling, which albeit making no claim to representativeness, is a common strategy in exploratory research. The case study opted for a purposive type of non-probability sampling where "researchers purposively choose subjects who, in their opinion, are thought to be relevant to the research topic" (Sarantakos, 1993). In this case, "the judgement of the investigator is more important than obtaining a probability sample" (ibid.). Throughout the data collection process, efforts were made in order to elicit information about service users' views on the impact that Telecare Plus is having on their quality of life. In between ice-breaker and closure questions, interview enquiries focused on that interface between the support awarded by Telecare Plus on one hand and quality of life on the other hand. Inspired and adapted from research by Moe and Molka-Danielsen (2012) research, interview questions included:

- Do you trust that you can call for help and be heard when needed? Does use of Telecare Plus in your home help you enjoy life? Does use of Telecare Plus in your home make life more meaningful? (*emotional wellbeing*)
- Do you have daily individual communication through Telecare Plus with your friends, family, support staff, and personal relations, in general? (*interpersonal relations*)
- How satisfied are you with your access to health services through Telecare Plus? How available is Telecare Plus for access to your day-to-day information technology needs? Does Telecare Plus improve your sense of personal dignity? (*personal development*)
- Does Telecare Plus facilitate the lives of your informal carers? (*physical wellbeing*)
- Does Telecare Plus help you in your personal relations? (*social wellbeing*)

Interviews were conducted with 26 older adults, all aged 60 years and above, with interviews ensuring unfailing adherence to the ethical principles (autonomy, beneficence, non-maleficence, justice) and rules (veracity, privacy, confidentiality, fidelity) surrounding ethical conduct. The final stage consisted in the rigorous analysis of data which resulted in the major themes presented in subsequent sections of this report. Data was analysed through 'logical analysis' which first located premises within data that symbolise one group, and then explored connections between groups (Glaser & Strauss, 1967).

6 Results and Discussion

Of the 26 older people who took part in the research, 16 lived alone and 10 with someone else, most with their spouse. Whilst 8 were male, the remaining 18 were female. All informants subscribed to the first generation services of Telecare Plus. The reasons whereby research participants chose to subscribe to Telecare were threefold - namely, a modification in their living situation, such as becoming widowed and starting to live alone; changes in their health (often involving hospitalisation) in response to which social workers suggested a Telecare subscription; and needing to put their 'mind at rest' if

they were to experience an emergency. In all three trigger situations, social relationships were central to the decision to subscribe to Telecare Plus. Family members were generally actively involved in organising the acquisition of this assistive technology service, usually with the aim of levelling their informal care responsibilities to a more manageable level. As one informant underlined,

> I am no longer young... On my return home from hospitalisation I was not as strong as before. I was afraid that I would fall again. I needed some reassurance that I could call for help if something happened... My children suggested Telecare. They dealt with the application process. They were resolute that it was either Telecare or applying for entry into a care home! I do not blame them. They cannot stay with me all day long. They work and have small children... All in all it was a good decision to apply for this service. It reassures everyone. Help is just one push away, no need to fumble with telephone numbers. My eyesight suffers these days.

Many research participants valued their regular participation in the community, especially attending religious functions at the nearest parish church, and visiting day centres for the elderly. It was positive to note that most enjoyed strong and supportive networks with neighbours in the community and family relatives. The fact that Malta is a micro-state where no locality is further away than a 45-minute drive (excluding rush hours) certainly enables children to provide informal care to their parents. Informants who claimed limited ability to leave their residences, particularly as a result of mobility troubles, reported that almost all their social interactions took place within their home, supplemented by visits to children's and other family relatives' residences on special occasions such as birthdays and national holidays. As expected, the phone played a central role in keeping contact with significant others, most claiming that they received a daily call from their children. Only two subscribers owned a computer and internet connection at home, with the rest of informants being digitally illiterate. As a consequence, many interviewees professed to experience social isolation or loneliness, some suffering considerably from one or both of these. Indeed, during the research interviews informants frequently mentioned the relatively recent deaths and loss of their loved ones and friends, and the increasing number of acquaintances who were no longer able to visit them due to frail health. In such circumstances, Telecare Plus filled an important void in older persons' lives. In an informant's own words,

> I am more alone at home than before. Many of my friends cannot visit me as they cannot leave their homes or take public transport. Although I can leave my home, I cannot walk long distances... My children also visit me less than they used to do... The Telecare helps me to overcome my worries and anxiety. The times when your family lived just round the corner and were available all throughout the days are long gone! The Telecare is good though, just one push of the button and you can speak to someone, I used it once when my oven stopped working, my son was here in less than an hour.

Research participants claimed that initially they perceived the Telecare Plus equipment as a cumbersome addition to their houses, especially when it was positioned in the living room. They experienced stress and subjective displeasure when facing the equipment as it reminded them of their frailty and vulnerability. However, all informants stated that they eventually got used to it, and even welcomed it in their homes once an emergency arose and they used the services of Telecare Plus with satisfactory results.

6.1 Emotional wellbeing

Informants emphasised that Telecare Plus enables them to engage in a more active lifestyle in their communities, supports them in carrying out everyday tasks, and effectively manages risks to their health and home environment. Even though some never had to use the facilities available through Telecare Plus, they felt confident enough to stay living in the community, knowing that if they ran into some kind of difficulty then it was relatively easy and uncomplicated to ask for help. Presented with the queries 'do you trust that you can call for help and be heard when needed?' and 'does the use of Telecare Plus in your home help you enjoy life and make life more meaningful?', informants reacted as follows:

> The Telecare makes it possible for people like me to stay living in the community. Sometimes I cannot sleep at night, I get afraid that I am going to suffer another heart attack or that someone will break into my house. Telecare reassures me! I would have had to apply for entry into a care home if it were not for Telecare.
>
> Telecare enables me to enjoy my home, and do the things I want to do, cook, phone my children, and receive visitors. I spend hours looking outside the window watching children going to school, the cars go by, and the religious processions on Good Friday, Easter Sunday and during the annual village feast. I know that

> with Telecare help is just a call away. It helps me to forget my physical problems and enjoy the day.

The contribution of Telecare Plus towards clients' emotional well-being was especially evident where service users found it difficult to use their telephone or an ordinary mobile phone, either due to physical limitations such as arthritis and even early stage dementia. The equipment provided service users with a lifeline to call for help in an emergency.

6.2 Interpersonal relations

Informants claimed that the Telecare Plus service functions as an interface that connects them on one hand, and family relatives and Telecare Plus operators on the other hand. In response to the questions 'do you have daily individual communication through Telecare Plus with your friends, family, and support staff?' and 'does Telecare Plus help you in your personal relations?', informants underlined how the service provides them with a supportive network that links adequate social welfare and social aid in the community:

> Being alone is the worst obstacle that older persons have to face in their daily lives. It is not that you will not have anyone to speak to but that if something happens to you, you are always afraid that you will not be able to reach for help. A few days ago I heard on the news about that old lady who was dead for two days before her family relatives went to visit. I feel that the key advantage of Telecare is that if I feel some physical ailment, especially at night when I am in bed, I can use the pendant to call for help. I do not have to get out of bed!
>
> Telecare puts you in a system. You become part of the system. I did not like it at first. I refused to admit that I am old and that I now need help. I think of myself more like a free bird if you know what I mean... I know that if it were not for Telecare I would not be able to stay at home, and do all the things that I do. I would not be able to live with my wife. How would I be able to bear that?... Entering a care home restricts you from living your life and meeting the people you want to meet, people you have been frequenting all your life.

During interviews, research participants often stressed the loss of strong interpersonal relations due to the loss of friends, neighbours, and family members who had died, or who were no longer able to visit because of poor health or disability. For frail users, their inability to leave their house meant that social interaction had become limited to visitors coming to their homes. As a result, their main challenges included loneliness and social isolation. Although the Telecare Plus enabled service users to stay and live longer in the community, it was not contributing much to sustaining satisfactory levels of interpersonal relations.

6.3 Personal development

The fact of getting used to the Telecare Plus equipment, experiences of using it in an emergency and dealing with alarms and alerts, was part of the lived experience of service users. It was positive to note that contrary to stereotypes that 'older persons' and 'information technology' cannot live side-by-side, research data found otherwise - namely, that technology could really become 'domesticated' and 'embedded' into the daily practices of later life. Many described how despite initially not being very positive about subscribing to Telecare Plus, where such a subscription was to an extent forced upon them by their family relatives (especially children), with time they gained much confidence and were now even feeling comfortable with this form of assistive technology. From responses to the questions 'how available is Telecare Plus for access to your day-to-day information technology needs?' and 'does Telecare Plus give you more opportunity for leisure activity?' it was evident that the service strengthened users' self-esteem and the execution of personal development plans:

> Services such as Telecare allow older persons such as myself to live in dignity. I never married, and as a result, do not have children. I have very minimal support, only that provided by neighbours and friends, most of whom are older persons just as myself. Telecare is the only alternative I have if I encounter an emergency. I do not have anybody to call in the middle of the night. When I felt dizzy some months ago, I used Telecare and everything was sorted out for me by dawn... Although I am old, I still want to do things in life, I still want to live my life. Nothing much, mind you, but for me even little things are important. Telecare provides me with the support I need to continue living in my community and continue living my life.

It was also evident that when service users had friends who also subscribed to Telecare Plus, the former do not feel 'different' from significant others in their social network.

6.4 Social wellbeing

Telecare can lead to a variety of outcomes and consequences for family carers of older people. Whilst there

is no doubt that caring for someone can be physically exhausting, to the extent that the physical health of carers tends to suffer greatly, constant worry also takes its toll on their mental health. Over half of the respondents perceived that their subscription to Telecare Plus had a positive effect on their family carers. Reasons forwarded were various and ranged from reduced stress, increased self-assurance about the safety and welfare of the person cared for, having more prospects for respite from caring, positive developments in the relationship with person cared for and family carer, to the capacity to remain in paid employment. In the informants' words,

> I want to continue living in my home as much as possible. I want to be considered lucky if I die here. But I do not want to be a burden on my children. My son and daughter have demanding jobs and both have children. At one point they were taking it in turns to sleep with me. After some months, we realised that this was no longer possible. They were no longer able to keep up with their lives. Telecare made it possible, as well as safe, for me to sleep on my own. Although they still visit me every day, now they are able to get on with their lives with minimal disruption as possible. They can sleep soundly at home knowing that if something happens to me, I can contact them through Telecare. Everybody feels better this way.

> My children are very happy that I accepted the Telecare service and that I know how it works. They love me but they cannot live with me. And I do not want to live with them. I tried to live with them but the experiment only lasted a week. We were all going mad! We live different lives and we have different lifestyles. I am too old to change mine and they are too young to accommodate my preferences. With Telecare everybody is a winner, my children sleep in their homes, I continue living at home, everybody's mind is at rest that help is just a push of a button away. It was a good decision. Telecare is easy to operate.

Telecare brings to family carers a peace of mind and a strong bearing on their social inclusion - leaving them more able to leave the house for any length of time to socialise, spend time with other family members or work - and most crucially, to dedicate some time to themselves. Assistive technologies also function to prevent crises by preventing health complications, which might result in a loss of independence and the need for higher levels of care provided by family members. Telecare provides family carers the ability to stay in or return to work, something that is not only a significant element of improving carers' future career prospects and social inclusion but also has a direct impact on the likelihood of family carers falling into debt and financial hardship.

6.5 Barriers

The research study highlighted a range of challenges towards an increased adoption of the Telecare Plus service by older people. From the tele-interviews, it was clear that constrained user-friendliness may restrict the aptitude to control technological equipment, just as cognitive limitations can hinder the understanding of procedures and navigation. Products are not always age-friendly - for example, directions may be in print, or in no print at all - so that instead of being empowering, assistive technologies may become the 'last straw' for an older person. This may result in older people having a limited knowledge of possible products, and hence, their functions and applications. As one informant explained,

> I resisted the introduction of Telecare because I took long to understand its functions. You hear Telecare this and Telecare that but nobody tells you exactly what it does. Nobody shows it to you. I never saw the Telecare equipment until the day it entered my home. None of my friends or relatives had it. So it was a bit too much for me to understand what it is and what it does. They should have demonstrations and adverts in television.

Lack of training on behalf of health professionals on the use of technology, or the capacity to act on information, are also potential impediments. This may result in some professionals resisting the further development and expansion of assistive technologies, which points to the strong need for organisations involved in health and social care partnerships to develop approaches for prioritising client access to the types of assistive technologies that they deliver. From the data it emerged that other potential barriers include the perception on behalf of subscribers that they will have difficulty engaging with the technological requirements of the Telecare Plus equipment:

> I resisted the introduction of Telecare because I was afraid that I would not be able to understand how it works. I was always afraid of technology. I am not well-learned, I barely went to school, I do not know how to drive, I barely can navigate the television set... I preferred to complicate my life rather than getting some technological device which I would not know how to operate... This was not wise of me, but I am like that, I do not have much

> confidence in myself. When you are illiterate you prefer to keep a step back.

At the same time, most research participants indicated that they initially associated the use of Telecare Plus with a high degree of dependency and ill health. Wishing to distance themselves from negative connotations of old age, sickness and dependence, it followed that they were not favourable to subscribe to the service. It is also possible that potential users believe that their quality of life will take a turn for the worse if they subscribe to an assistive technology in terms of potential threats to existing independence and service arrangements. However, what is clear is that a lack of information and discussions about prospects regarding the technological interventions also leads to decisions to decline telecare services.

7 Conclusion

This study sought to conduct a systematic review of the home telecare service for vulnerable older people in Malta. Its goal was to examine the potential effects of telecare in terms of benefits to individuals and carers. Results indicated that the key reasons whereby research participants chose to subscribe to Telecare Plus were three-fold: namely, a modification in their living situation, such as becoming widowed and starting to live alone; changes in their health; and pressures on behalf of children so as for the latter to 'put their mind at rest'. All things considered, the Telecare Plus service was contributing in exceptionally positive ways towards the quality of life of both subscribers and informal carers, as exemplified by the statement of one of the informants: "With Telecare everybody is a winner, my children sleep in their homes, I continue living at home, everybody's mind is at rest that help is just a push of a button away" (male, 70 years old).

Assistive technologies such as Telecare Plus have the potential to empower older persons to continue living at home if that is their preference, although it is noteworthy that there will always be some compromise between meeting the desired sense of independence and an enduring element of risk in living at home. At the forefront of benefits for users, telecare systems can alleviate the anxiety caused by age or long-term health conditions, whilst also improving an older person's sense of security and self-confidence. Moreover, since most available telecare systems have the possibility to be upgraded to incorporate second, third and fourth generation services, the level of telecare provision can be increased as new health problems develop. Telecare systems also alleviate some of the burdens and anxieties that affect informal carers, and hence, serve to improve their quality of lives too. This is highly positive as it can encourage family members to carry on caring for longer, which can circumvent the older person moving into a care home for longer periods. Although not as a result of this study, it is evident that third and fourth generation telecare technologies assist in caring for older people suffering from long-term chronic conditions such as diabetes, asthma and high blood pressure. Hence, this encourages older people with these conditions to remain living at home, while also monitoring any further deterioration in their condition. This means that telecare systems also have the potential to be cost-effective by circumventing or postponing a person's move into a care home or hospital. Indeed, telecare can hasten an older person's discharge from hospital by providing added support in their own residence or in another intermediate care setting, thus freeing up hospital beds.

The research data elicited possible barriers to the take up of telecare services in Malta. Indeed, although there exists an overabundance of innovative forms of assistive technologies, the uptake is far from ideal. Most preoccupying was the fact that none of the informants in the convenience sample subscribed to second, third and fourth generation versions of Telecare services. In addition to the potential difficulties listed in the results and discussion section, especially the constrained user-friendliness, the fact that the field of assistive technologies lacks efficient and clear business models constitutes a key limitation towards the take up of such services. The adoption rates of assistive technologies are very low in most countries, with very few people living in smart homes, and with the available ones generally existing for research and demonstration purposes. This occurs despite the fact that the need for such technology is apparent through the predominance of issues ranging from wandering, leading to getting lost and self-harm, accidental falls, medication complications, continence management, and the high fear of crime amongst older persons. Indeed, one missing element constitutes a business process for assessment, specification of suitable technology, installation, and maintenance, and a service to monitor the signals. At the same time, existing business models are wrong to project assistive technologies as the solution to all social and health care ailments, and it remains necessary that assistive technology is clearly recognized as only one component of a care package. For instance, technological systems for monitoring a person's vital signs are to be linked to systems and protocols for providing assistance when required. Moreover, given its holistic approach to health care, strategies for increasing population access to assistive technologies need to be developed by, and have the support of, all stakeholders responsible for the welfare of older and ageing people.

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