An Analysis of Professional's Perspectives on the Roles of Socio-cultural Factors and Welfare Technology among Older Adults in the US

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사회문화적 요인이 미국 고령층의 복지기술 수용에 미치는 영향: 전문가 인터뷰를 중심으로

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Abstract The purpose of this qualitative study was to identify cultural factors among older Americans that could influence them to accept new welfare technologies. This study also explored how social and cultural-based plans could increase the acceptability of welfare technologies for improving the quality of life of older adults in the future. In-depth interviews were conducted with ten professionals who work with older adults. The collected interview data were subsequently analyzed using a two-cycle open coding process. The data analysis generated 29 codes that were organized into 7 primary codes, or categories, and 22 secondary codes nested within the primary codes. Several themes were identified: individualism, family-oriented culture, pragmatism, low-context culture, privacy, fun-seeking culture, and a less hierarchical culture. These findings will inform the development of a future survey to examine the relationship between older adults' intentions when using technology and socio-cultural factors in community settings. In order to explore the different impact levels of the cultural factors found in this study, the future study will need to include measures for identifying socio-cultural variations among individuals in one country or across countries.

Keywords : Welfare Technology, Technology Acceptance Model, Basic Qualitative Study, In-Depth Interview, Socio-cultural Factors

요 약 본 연구의 목적은 질적연구방법을 이용하여 미국 고령층의 복지기술 수용성에 영향을 미치는 사회문화적 요인을 추출하고 각 요인과 복지기술 수용성간의 연관성을 분석하여 향후 고령자의 삶의 잘향상을 위한 사회문화적 기반 복지기술 수용성 증진방안을 도출하는데 기여하기 위함이다. 10명의 노인분야 전문가와 심층인터뷰를 통해 수집한 자료를 두 차례에 걸친 개방형 코딩 프로세스로 결과를 도출하였다. 자료분석 결과 7개의 주 코드와 주 코드에 중첩된 22개의 2차 코드 등 총 29개의 코드를 통해 사회문화적 요인을 추출하였다. 분석결과 개인주의, 가족중심문화, 실용주의, 저맥락 문화, 프라이버시, 재미추구와 수평적문화 등이 미국 고령층의 복지기술수용에 영향을 미치는 사회문화적 요인으로 나타났다. 이 연구결과는 고령층의 복지 기술사용의도에 영향을 미칠 수 있는 국가별 문화적 차이를 정의하고, 각 요인과 복지기술 수용성간의 관계를 분석하기 위한 설문조사 개발에 기여할 것이다. 이를 위해서는 향후 연구에는 한 국가 또는 국가 간 사회문화적 차이를 설명하는 척도개발이 필요하다.

주제어 : 복지기술, 기술 수용성 모델, 기본 질적 연구, 심층인터뷰, 사회문화적 요인

1. Introduction

Advancements in newer technology designed for older adults can contribute to improved quality of life [1]. This is known as welfare technology and is defined as the knowledge and use of technology that provides or increases, "the feeling of safety, activity, participation and independence" for all age groups [2,3]. Employing innovations that encompass information and communication technology (ICT), welfare technology is grounded in an approach that goes beyond single assistive technologies, such as mobility aids, hearing aids, and cognitive aids[4].

Policymakers in Nordic countries recently introduced welfare technology to their society, presenting it as a tool to help all age groups [5,6]. It has become commonplace in these countries to employ technology, such as, using smart speakers to connect with family members who are not living in the same household, employing social robots to serve as companion(s), and having health-monitoring sensors toconnect people to health care systems.

The novelty of welfare technology means that little is known about how it is accepted and understood by older adults and their family members. The current body of research does not clearly identify the factors related to the acceptance of these new technologies. Older adults' reasons for adopting or not adopting novel technology may be attributable to their unique life experiences and the perspectives gained from those experiences [7,8]. Cross-cultural comparison studies have explored the relationship between individual factors and technology acceptance among younger populations, such as college students [9,10]. However, explorations of the relationship between these factors and technology acceptance among older adults are scarce.

2. Literature Review

There are numerous factors that explain how and why older adults accept a novel technology and purchase it for use. Many previous studies have employed the Technology Acceptance Model (TAM), which was developed by Davis [11,12] to improve their understanding. The components of TAM are: 1) perceived usefulness, 2) perceived ease of use, 3) technology acceptance attitude, 4) technology acceptance behavioral intention, and 5) actual technology use [12]. This model has been tested and proved its high explanatory power [13-16].

Some researchers have refined TAM with additional factors. For example, Chau[17] suggested two types of perceived usefulness (near-term and long term) and Naspetti et al.[18] added even more, such as subjective norms. Others emphasized the importance of considering local contexts [19]. Moreover, modified TAMs have been tested among various groups, for example with nurses and medical doctors [20].

Few studies on welfare technology implementation have been conducted with the workforce that provides services to older adults. Those studies found some resistance among the service providers because they believed new technology could be used to replace them or to have increased their workload [21]. The negative perspectives in these findings provide a contrasting viewpoint on new welfare technology to other studies that focus on the benefits of using welfare technology [22]. Thus, a future study about the perspectives of the professionals developing devices and those who provide services to older people would be worthwhile.

Even studies conducted with people who are receiving services did not focus exclusively on older adults. Previous studies have either included all age groups or a relatively younger population and their use of devices and

technology. In order to improve the understanding of the technology acceptance model, this exploratory study focuses only on the age group of 65 and older.

The external components of David's TAM include individual demographic factors. Few studies include the unique cultural factors in the U.S. For marketing purposes, taking cultural factors into consideration would be critical and important because the mismatch between older adults's needs or abilities and available technology products [23].

2.1 Purpose of the Study

The purpose of this qualitative study was to identify the socio-cultural factors that could impact technological acceptance among older adults (aged 65 and up) in the United States, and to explore whether these findings could be applied to Korean populations.

In the year 2020, American Baby Boomers, who were born between 1946 and 1964 [24], ranged in age from 56 to 74 years old, which constitutes the majority of all older adults in the US. Korean Baby Boomers, born from 1955 to 1964, were between 56 and 65 years old—just beginning to enter the older-adult group [25]. Thus, the findings from this study on cultural factors could be expanded to the Korean culture as it relates to the enhancement of Korean technological acceptance.

Through in-depth interviews with professionals who work with technology for older adults in the United States, this study planned to identify socio-cultural factors related to their acceptance of welfare technology, which would be beneficial for helping this population to make choices associated with improving their quality of life. The findings from this study can be useful in future projects with older participants in the community.

Older adults tend to live in one place longer than other age groups and their behavior can be influenced by community-based cultural factors. However, there is a lack of quantitative studies designed to explore the relationship between older people's technology acceptance and cultural factors. This is because the unique characteristics from both the life-long experiences of older people and socio-cultural factors could influence technology acceptance.

According to the Federal Interagency Forum on Aging related statistics [24], 52 million adults aged 65 and up comprised 16% of the total population. By the year 2030, the number of older adults will account for 20% of the population.

Approximately 1 in 5 people aged 65 and older have limited their driving during the day because of a health issue, for example, making them more likely to be homebound. The proportion is higher among those who are 85 and older. Therefore, employing welfare technology to reduce social isolation would be beneficial for older people and their family, relatives, and friends.

3. Methods

We employed the qualitative research method approach and this approach was utilized due to following reasons. We are interested in understanding the phenomena related to technology acceptance and sociocultural influence. There are still very few older adults who fully understand technology because welfare-technology has not yet been widely disseminated and used in the U.S.

In addition to completing research methods and qualitative methods graduate coursework, the project's research team members completed their research and ethics training through the affiliated university's Institutional Review Board (i.e., CITI program certifications). This was to ensure the use of ethical date collection practice

with human-subjects with respect to confidentiality.

Merriam and Tisdell [25] suggested six (6) common qualitative research designs. According to their labeling, our study can be identified as a "Basic Qualitative study" because "the researcher is interested in understanding the meaning a phenomenon has for those involved⋯Data are collected through interviews, observations, or document analysis⋯The analysis of the data involves identifying recurring patterns that characterize data." The findings are those recurring patterns or themes supported by the data from which they were derived. The overall interpretation will be the researcher's perception of the participants' understanding of the phenomenon of interest. (pp 24-25) [25]

In this Basic Qualitative study, several research team members first listened to the collected audio-file data several times and transcribed the information. This was followed by different team members reading the transcriptions and processing the meanings for context. Second, we identified sociocultural factors influencing older adults' welfare-technology use and then used a peer- reviewing process among the research team. Third, the first-cycle coding of the data included both elemental and affective methods [31]. According to Saldana [31], elemental coding refers to primary and basic approaches used to develop a foundation; affective coding refers to the identification of human experiences through emotion and values. The data analysis generated 29 codes that were organized into 7 primary codes, or categories, and 22 secondary codes nested within the primary codes. Based on these codes and categories, we cited the participants' interview content.

3.1 Sampling Plan

We employed a nonprobability sampling method to understand the experiences and perspectives of professionals who have worked with older people in the community and who have been involved in the design of newer technologies [25]. We used a combination of convenience and snowball sampling for recruitment; this was a new area of research and snowball sampling was helpful for contacting professionals during the COVID-19 pandemic.

3.2 Recruitment of Participants

After IRB approval, the principal investigator reached out to community-based professionals who work with older people in the community and have knowledge of newer technologies. The principal investigator believes it is important to explore professional perspectives to learn what compels developers and marketers to introduce newer technology for older adults. Community-based professionals interested in participating in the study were provided with an informed consent and received an $80 gift card (i.e., Walmart or Target) as compensation. The interviews were audio-recorded after the informed consents were signed.

We conducted this basic qualitative study to gather information from professionals who understand the needs of older adults related to technology use and acceptance. The reason we choose professionals rather than older adults for data collection is that welfare technology for older adults is not yet widely spread and fully understood by older adults. Another goal of this study was to use the data to develop a quantitative survey with socio-cultural constructs designed for understanding older adults' technological acceptance.

3.3 Data Collection

The PI conducted 60-90-minute interviews that were audio recorded with ten (10) experts in technology for older adults from September 2019 to February 2020 in the New England region of the United States. The PI conducted

semi-structured interviews with five (5) community-based organization professionals who had familiarity and experience in providing technological services to older adults. In addition to collecting data from community-based professionals, five (5) technology experts interested in the development of technology for older people were also sought out after participants provided referrals to professionals in the field of Aging and Technology.

Table 1. Participants

Participant (Random Name Generator was used)	Role & Professional Expertise (Engineers or Community-Based Professionals)
1. Emelia	Engineer, University Aging Research Lab Research Associate, has been involved in the development of technology for older people
2. Bob	Engineer, University Biomedical Department Research Associate, is interested in the development of a device to detect cognitive impairment
3. Henry	Engineer, University Biomedical Department Research Associate, is interested in the development of a device to detect cognitive impairment
4. Rocco	Biomedical Engineer, developed health-related devices for older people and marketed them to sell
5. Nia	Former Executive Director of a local government aging agency
6. Ronan	Current Program Manager of a local government aging agency
7. Betty	Local community-based agency employee who works with older people in long-term care facilities
8. Philip	Local community-based agency board member. Information Technology Specialist, interested in working with older people in the community
9. Kara	Local community-based agency social service agency employee provide help with different professionals
10. Violet	Local government aging agency program employee, over 20 years of experience working with older people

Each research team member developed a list of primary and secondary codes to be used for group comparison and discussion. For example, one research team member coded 'Safety' as a primary code and 'Comfort' as a secondary code nested within 'Safety.' The team then met to compare their codings, exchange and review rationales, and generate agreement on what

Institutional review board approval was obtained from the affiliated institution prior to conducting the ten (10) interviews. All of the interviews were held either at the community-based professional's office or the PI's office, without any other person present in order to have privacy.

3.4 Data Analysis

The interview data were transcribed into a word document, checked for errors by two graduate students, and uploaded into NVivo 12 Plus for analysis. First, members of the research team independently coded a sample of the interview transcripts using a two-cycle open coding process. This ensured consistency in the data analysis [26,27].was found, such as categories and themes [28-30].

In a qualitative study, understanding is achieved by consolidating and interpreting the data that has been collected from the participants through an iterative process [25]. The following questions helped the researchers to construct, sort, and name the categories identified during the analysis:

1) What is your definition of technology related to working with older adults?
2) What would be a unique cultural factor or ideology in the United States that might influence older adult's behavior and/or attitude regarding technology and aging?
3) What role do socio-cultural factors play in the intention of using technology?

Overall, we asked what cultural factors would be relevant to creating an impediment to older adults using a new technology.

The first-cycle coding of the data included both elemental and affective methods [31]. According to Saldana [31], elemental coding refers to primary and basic approaches used to develop a foundation; affective coding refers to the identification of human experiences through emotion and values. Elemental coding methods,

such as in-vivo coding, refer to obtaining an awareness of participant perspectives to drive the initial coding process, particularly for interview transcripts [31]. For this study, in-vivo coding also examined participants' values, attitudes, and beliefs around the use of technology for geriatric populations. After the first coding cycle, research team members

implemented a second cycle using eclectic coding and pattern coding. Eclectic coding refines the first coding cycle's choices. Pattern coding helps categorize coded data for initial analysis [31,32]. According to Merriam and Tisdell [25], constructing categories is a form of open coding due to the open possibilities within the data. This includes the use of axial coding during the second coding cycle, during which open codes are grouped into categories.

4. Results

The data analysis generated 29 codes that were organized into 7 primary codes, or categories, and 22 secondary codes nested within the primary codes. The primary codes were 'Safety,' 'Practicality,' 'Technological Literacy,' 'Affordability,' 'Autonomy,' 'Exposure,' and 'Accessibility.' An example of a secondary code for 'Practicality' was 'convenience of the technology' and a secondary code example for 'Technological Literacy' was 'defining technology.'

The descriptive statistics in Table 2 illustrate the primary and nested secondary codes, descriptions of the codes, the number of participants who made comments related to those codes, and the frequency with which the comments were made by the participants during the interviews. For example, 'Affordability' was mentioned by each of the 10 participants for a total of 39 times.

4.1 Primary and Secondary Codes

The 'Safety' category refers to the participant's perception of privacy and trust when using a technological device, such as a smartphone. This category includes the following secondary codes: comfort using technology, the economic system, government regulation around technology, and the use of personal data by companies and third parties such as Facebook or Google.

'Practicality' refers to the participant's perception of how useful and convenient technology is. One example was using an iPad tablet and having the ability to video chat with distant family members through its FaceTime application. The secondary codes in this category are convenience from using technology, engagement in using technology, physical health, socialization, and entertainment.

'Technological Literacy' refers to participant's perception of their knowledge and education in identifying technology, why it is used, and understanding how to use it. An example is a participant broadly defining technology, explaining why they would use it such as an iPhone, and articulating how they have used or would use it. The secondary codes included in this category are defining technology, acceptance of technology, identifying mobile technology, identifying future types and uses of technology, understanding differences in technology, and wanting technical support to use technology when needed.

The 'Affordability' category refers to the participant's perception of whether an individual has the financial resources to obtain technology, such as a smartwatch. A secondary code for this category is low-income individuals.

'Autonomy' refers to the participant's perception of their independence and personal choice to use technology. An example of this category is an individual choosing to use a technological device without social influence

explicitly affecting their decision. The secondary codes include social skills and technological stigma towards older people.

The 'Exposure' category refers to a participant's perception of being exposed to technologies like Google Home or Amazon Alexa. An example is a younger family member introducing the device or older people viewing a commercial on television. The secondary codes include geographical location (i.e., rural), information through advertisements, and isolation.

'Accessibility' refers to the participant's perception of having access to technology, such as the Internet. An example of this category is an individual lacking transportation to use a computer at the local library. A secondary code is transportation to access technology.

We connected cultural factors and the seven primary codes. Some cultural factors, such as affordability, would be universal across cultures and countries. However, the level of importance or intensity of those cultural factors may be different. According to Hall [33], the United States is regarded as a low context culture, which requires direct and explicit communication.

4.2 Connections between Findings and Cultural Factors

4.2.1 Individualism, independence, and self-determination

Culturally, independence refers to an individual's autonomy and self-reliance. According to Hofstede [34], the United States has a highly individualistic culture, yet its members maintain a greater degree of interdependence than those in other countries. Consequently, the older population in the United States was raised in and has lived under this cultural factor. The categories 'Autonomy', 'Technological Literacy', and 'Affordability' describe technology obtainments and use. Even though older people would like to have independence and autonomy, the level of their technological literacy and the

cost of purchasing new technology can serve as barriers.

Several of the professionals described these cultural factors among older adults based on their work experience:

That's really the most important stuff to them, their independence. They want to stay that way [independent] as long as possible. You'll hear it time and time again but also, if it saves them money, they're huge on that. So, if it's something that would benefit [them] in the long run, as far as for independence but also cost effectiveness, they did certain things that they would find cheaper for them to do it that way.

4.2.2 Family-oriented culture

Family orientation refers to supporting and strengthening the family unit rather than the individual. The level of family-oriented culture in the United States is relatively weak when compared to other cultures, such as Korean or Korean-American [35], or Chicana/o Families [36]. However, this does not mean there is an absence of support among family members. A common example in the United States could be the relocation of an older family member to a nursing home to receive necessary care [37]. The secondary codes of 'Socialization' and 'Convenience' in the category of 'Practicality' are related to this cultural factor. The use of technology provides an opportunity for older individuals to socialize with family members through a digital platform. This may create a sense of convenience for older adults who may be unable to travel or physically see their family members.

Some professionals described the family-oriented culture based on their own caregiving experiences:

Even with those services being available, there will always be a role as a family caregiver. Even if there is a service available to you, the family will have to get involved somehow

Table 2. Coding Description and Frequencies

Primary and Secondary Code		Description	n	# of Mentions	Cultural Factors
Accessibility		Access to technology	8	13	
	Transportation	Access to transportation	1	3	
Affordability		Resources to obtain technology	10	39	Individualism, independence, and self-determination
	Low-income	Individual living in poverty	3	7	
Autonomy		Independence and self-reliance	8	30	Individualism, independence, and self-determination, Less hierarchical culture
	Social skills	In-person communication skills	2	11	Low context culture
	Technological stigma	Technology stereotypes towards older individuals	5	13	
Exposure		Exposure to technology	6	21	Privacy
	Geographical location	Physical area: rural and urban	2	8	
	Information	Marketing, advertising, word of mouth	7	10	
	Isolation	Lack of technological opportunities	9	17	
Safety-Trust and Privacy		Trust and privacy in technology	8	91	Privacy, Less hierarchical culture
	Comfort	Feeling of comfort	6	27	
	Economic system	Capitalism/free market	3	10	
	Government regulation	Government oversight of technology corporations	3	11	
	Use of data	Privacy and use of data collected by business	4	26	
Technological Literacy		Technology education	10	67	Individualism, independence, and self-determination, Pragmatism
	Acceptance	Acceptance of technology through understanding	5	17	
	Future technological use	Identification of future technologies and their uses	2	10	
	Mobile technology	Identification of mobile technologies and their uses	5	30	
	Technology definition	Provision of examples of technology definitions	4	5	
	Technology differences	Identification of various contrasting technologies	9	43	
	Technological support	Presence of assistance when using technology	4	8	
Practicality		Usability of technology	9	78	Pragmatism
	Convenience	Benefits from using technology	6	36	Family-oriented culture More indulgence, fun-seeking culture
	Engagement	Enthusiasm toward and after using technology	3	7	More indulgence, fun-seeking culture
	Physical health	Monitoring physical health using technology	5	11	
	Socialization	Interacting with others using technology	5	11	Family-oriented culture Low context culture More indulgence, fun-seeking culture
	Entertainment	Leisure and enjoyment	5	5	More indulgence, fun-seeking culture

to figure things out, to arrange things somehow. There will always be a family caregiver's role, I think. That also holds true for technologies, I think. So, even if technology can monitor different conditions, help you do different tasks and automate things, someone has to set that up.

4.2.3 Pragmatism

Americans are known to be pragmatic. Pragmatism, within the current study, refers to an individual's attitude about the practicality of using technology. It is a historical fact that pragmatism as a philosophy originated and was developed in the United States. Pragmatism is described as "the beliefs which are guides to actions and should be judged against the outcomes rather than abstract principles." (p.892) [38]. Older adults who were born after World War II were heavily influenced by pragmatic beliefs. One professional described 'pragmatism' as follows:

How they manifest in people's lives to make their lives easier /more convenient /more connected … Yeah, that's how I would say it. I don't really see it being any different for older adults; except some older adults may have needs that are different than other people. Still, the ultimate goal is to make life easier and more convenient.

4.2.4 Low context culture

Meyer [39] stated, "the United States is the lowest-context of the Anglo-Saxon culture" (p. 41). She went on to explain that,

…the US is a country with a mere few hundred years of shared history, has been shaped by enormous inflows of immigrants from various countries around the world, all with different histories, different languages, and different backgrounds. Because they had little shared context, Americans learned quickly that if they want to pass a message, they had to make it as

explicit and clear as possible, with little room for ambiguity and misunderstanding. (p. 40)

The secondary codes of 'Social Skills' in the category of 'Autonomy,' and of 'Socialization' in the category of 'Practicality' relate to a low context culture. Older adults in the United States are often the descendants of immigrants and, at times, are first-generation citizens. As a result, this population needs to receive clear and precise communication to provide relevance when deciding to accept new technology.

One example narrative from a professional relates to this theme.

I drive my kids crazy that I don't text. I go, "If you wanna talk to me, call me. And if you don't want to talk to me don't call me. But don't send me a telegram for God's sake, okay? I'm not going to read a telegram." So, that's who we are, but [what] older people understand is that words are a tiny fraction of communication. I don't know what the numbers are, but like 10 or 15 percent of communication are the words. The rest are body motions, facial motions, and intonation. All of that is where most of the communication is and you can get that with Skype. You can't get that with a telephone and you can't get that with a text message.

4.2.5 Privacy

Privacy refers to an individual's desire to be left alone, a need for anonymity, or a need for withdrawal. The dictionary definition is "an individual's need to selectively control the access of others to the individual" [40]. There are two leading classic definitions of privacy—Altman [41] and Westin[42]. Westin [42] proposes that "privacy is a claim of individuals, groups. or institutions to determine themselves when, how, and to what extent information about them is communicated to others…" (p. 7). This definition is very relevant for older adults, with regards to the information collected by new technology. Altman's [41] privacy is "the selective control of

access to self, involving dialectic, optimization, and multimodal process" (p. 67). These theories provide the foundation that the need for privacy competes with the need for social interaction with self-disclosure. With online technology, finding that balance is a complicated task [40].

According to the 2018 AARP Home and Community Preference Survey, three quarters of respondents aged 50 and over want to remain in their own home [43], indicating the importance of privacy to older populations in the US. The categories of 'Safety' and 'Exposure' are related to this cultural factor of privacy.

One professional describes Privacy, Safety and Exposure as followed:

Yeah, I think it's completely bogus. I know this one is bogus but I've seen the data. I don't know what health information you can get off of your wrist; you can get a pulse. Again, it gets back to monitoring. People are kind of obsessed with data; we didn't have data. Remember, we were people that pumped water by hand. So, do we need all that data? Do I need to know, continuously, what my blood pressure is, what this is, what that is? The answer is no; and you know you're going to get over-medicated. The more data you have the more there is in the data mine and the more likely you are to find something wrong with me.

4.2.6 More indulgence, fun-seeking culture

The cultural factor of seeking indulgence and fun refers to being entertained and seeking pleasure[34]. An example for older adults can include using a Nintendo Wii and Virtual Reality gaming to have fun, thus improving their quality of life. The category of 'Practicality' relates to this cultural factor, especially for the secondary codes of 'Entertainment,' 'Socialization,' 'Convenience,' and 'Engagement.'

One professional believed it would be important to have a fun factor in any technology:

Let's start with the Wii. I think it's a really great interactive gaming system. But (it) does require, well it doesn't 'require' I say but, the ability to get up and move and do exercises with it. It's like a mix of physical and the video technology. You can do bowling, tennis, almost any type of game. And it, like I said, is physical. You can get up and you can do it instead of just sitting down. It's very, very interactive.

4.2.7 Less hierarchical culture

Americans believe themselves as egalitarian people (p.144) [39]. This less-hierarchical cultural factor refers to a society that values more horizontal relationships [39]. In a culture or environment with less hierarchy, people may express their opinion more freely, without worrying about retribution from an authority or leadership [34, 39]. "Cultural hierarchies reflect inherent inequalities…, centralization is popular, subordinates expect to be told what to do." [44] The 'American dream' is a typical example; most Americans do not want to have an authority's intervention, as seen by the protests in reaction to the Centers for Disease Control and Prevention guideline to prevent the spread of COVID-19 among some American people by wearing facemasks and/or practicing social distancing.

The categories of 'Autonomy' and 'Safety' are related to this cultural factor. One professional spoke about this as follows:

So, thinking about things like alarm pendants or emergency response systems—they've been around forever. They've been around for decades. Everyone's seen commercials around an older adult having fallen and can't get up. So, everyone knows about them, they're not expensive. But one of the main reasons that people don't use them is, once you wear them around your neck or on your wrist, it's a sign of dependence. It's a sign that you're saying to the whole world that you need help. You are frail; you're not capable.

5. Discussion

5.1 Limitations

While this study has the potential to contribute to existing knowledge in understanding critical cultural factors associated with new technology for older adults, there are limitations to be considered.

First, the knowledge and interpretations generated from this study were informed by an interchange of perspectives between the professionals who participated in this study and me. as the PI. This is conditional to the limitations of my own knowledge and understanding about welfare technology.

In this exploratory qualitative study, we did not aim to provide generalizations, but to find the complexity of current descriptions of cultural factors and new technology acceptance among the older population. Moreover, the participants for this study were limited to professionals from the New England area and two different service areas (Engineering and community-based social services). Thus, future research should involve a comparative analysis of participant samples from different geographic regions and from diverse disciplines.

Inclusion of the perspectives of professionals from diverse disciplines may further complexify the current study findings, resulting in a different or increasingly nuanced understanding of the processes involved in new technology acceptance.

5.2 Implementation of future studies

Due to the COVID-19 pandemic, in-person interaction was prohibited and local senior centers were closed beginning in March, 2020. Thus, contactless-based technology such as virtual senior center or phone-based services were provided. However, this was provided without proper assessment of older adults' technology preferences or needs.

This exploratory research project will be used to contribute to a future comparison study between the US and other countries, which may have different social and cultural backgrounds and contexts.

This study was conducted to identify cultural factors among older American adults living in a community as they relate to technology use. In order to explore the different impact levels of the cultural factors found in this study, the future study needs to include measures for checking on differences among individuals in one country or across the countries.

The respondents in this study are experts who have extensive work experience with older adults; some of them are 65 years of age or older themselves. They believe that all people, including older adults, want to have new technology or would like to try new technology. According to the study's respondents, the primary concerns surround privacy and cost, and these two main barriers need to be removed for older people to use novel technology in order to be more connected with their family members. This is especially critical after experiencing the COVID-19 pandemic.

REFERENCES

[1] R. Schulz, H-W. Wahl, J.T. Matthews, A. De Vito Dabbs, S.R. Beach, & S. Czaja (2015). Advancing the Aging and Technology Agenda in Gerontology. *The Gerontologist, 55(5)*, 724-734.
DOI : 10.1093/geront/gnu071

[2] S. Frennert & K. Baudin (2019). The concept of welfare technology in Swedish municipal eldercare, *Disability and Rehabilitation.*
DOI : 10.1080/09638288.2019.1661035

[3] J. A. Lee (2018). Trend and challenges of using welfare technology in elderly care. *International Journal of Contents, 14(2)*, 30-34.
DOI : 10.5392/IJoC.2018.14.2.030

[4] National Institute of Child Health and Human Development (2018). What are some types of assistive devices and how are they used? Retrieved from https://www.nichd.nih.gov/health/topics/rehabtech/c

onditioninfo/device

[5] J. K. Kim. (2018). Study on Welfare Technology and Welfare Technology Assessment for older adults. *Journal of Korea Contents Association, 5*, 156-166.

[6] Nordic Welfare Center (2020). *Welfare Technology*. Retrieved from https://nordicwelfare.org/en/welfare-policy/welfare-technology/#:~:text=Welfare%20technology%20is%20all%20technology,a%20disability%20or%20the%20elderly.

[7] A. E. Molzahn, M. Kalfoss, M. K. Schick, & S. M. Skevington (2010). Comparing the importance of different aspects of quality of life to older adults across diverse culture. *Age and ageing, 40(2)*, 192-199.

[8] L. Wang, P.L.P. Rau & G. Salvendy. (2011). A cross-culture study on older adults' information technology acceptance. *International Journal of Mobile Communications, 9(5)*, 421-220.

[9] D. Al-Jumeily, A. Hussain, & S. Crate. (2014). The impact of cultural factors on technology acceptance, students point of view. In Proceedings of the International Conference on Frontiers in Education: Computer Science and Computer Engineering (FECS), Las Vegas, NV., 1-7. Retrieved from http://worldcomp-proceedings.com/proc/p2014/FEC2413.pdf

[10] S. Merchant. (2007). Exploring the influence of cultural values on the acceptance of information technology: An application of the technology acceptance model. *Issues in Informing Science and Information Technology, 4*, 430-443.

[11] F. D. Davis. (1985). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* (Doctoral dissertation, Massachusetts Institute of Technology)

[12] F. D. Davis. (1989). Perceived usefulness, perceived ease of use, and use acceptance of information technology. *MIS quarterly, 13(3)*, 319-340.

[13] D. A. Adams, R.R. Nelson, & P.A. Todd (June, 1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *Management Information System (MIS) quarterly*, *16(2)*, 227-247

[14] A.R. Hendrickson, P.D. Massey & T. P. Cronan. (June, 1993). On the test-retest reliability of perceived usefulness and perceived ease of use scales. *MIS quarterly, 17(2)*, 227-230.

[15] R. Rauniar, G. Rawski, J. Yang, & B. Johnson. (2014). Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management, 27(1)* 6-30. DOI : 10.1108/JEIM-04-2012-0011

[16] V. Venktatesh & F. D. Davis (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science, 46(2)*, 186-204.

[17] P.Y.K Chau (1996). An empirical assessment of a modified technology acceptance model. *Journal of Management Information Systems, 13(2)*, 185-204.

[18] S. Naspetti, S. Mandolesi, J. Buysse, T. Latvala, P. Nicholas, S. Padel, E. J. Van Loo, & R. Zanoli. (2017). Determinants of the acceptance of sustainable production strategies among dairy farmers: Development and testing of a modified Technology Acceptance Model. *Substantiality, 9*, 1805-1821. DOI : 10.3390/su9101805

[19] P.F. Musa. (2006). Making a case for modifying the technology acceptance model to account for limited accessibility in developing countries. *Information Technology for Development, 12(3)*, 213-224. DOI : 10.1002/itdj.20043

[20] P. Ketikidis, T. Dimitrovski, L Lazuras & P.A. Bath (2012). Acceptance of health information technology in health professionals: An application of the revised technology acceptance model. *Health Informatics Journal, 18(2)*, 124-134.

[21] D. F. Mahoney. (2010). An evidence-based adoption of technology model for remote monitoring of Elders' Daily Activities. *Ageing International, 36(1)*, 66-81.

[22] R. Schulz, H-WWahl, H-W., Matthews, J.T., De Vito Dabbs, A., Beach, S. R., & Czaja, S. (2015). Advancing the Aging and Technology Agenda in Gerontology. *The Gerontologist, 55* (5), 724-734. DOI :10.1093/geront/gnu071

[23] M. Lenca, M. Lipps, T. Wangmo, F. Jotterand, B. Elger, R. Kressig (2018). Health Professional's and researchers's views on Intelligent Assistive Technology for Psychogeriatric Care. *Gerontechnology, 17(3)*, 138-149. DOI : 10.4017/gt.2018.17.3.002.00

[24] Federal Interagency Forum on Aging-Related Statistics. (2020). *Older Americans 2020: Key indicators of well-being*. Washington, DC: U.S. Government Printing Office. Report

[25] J. Kim. (2020). Senior Business Overseas Cases and Strategies for Revitalization, *Aging Review Quarterly, 37,* 30-42. Korea Insurance Research Institute.

[26] S. B. Merriam, & E. J. Tisdell. (2016). *Qualitative Research: A Guide to Design and Implementation*. San Francisco, CA: Jossey-Bass.

[27] L. Burla, B. Knierim, J. Barth, K. Liewald, M. Duetz, & A. Thomas, A. (2008). From text to codings: intercoder reliability assessment in qualitative content analysis. *Nursing Research*, 57*(2)*, 113-117. DOI : 10.1097/01.nnr.0000313482.33917.7d

[28] C. MacPhail, N. Khoza, L. Abler, & M. Ranganthan, M. (2016). Process guidelines for establishing intercoder reliability in qualitative studies. *Qualitative Research, 16(2)*, 198-212. DOI : 10.1177/1468794115577012

[29] M. J. Belotto. (2018). Data analysis methods for qualitative research: managing the challenges of

coding, interrater reliability, and thematic analysis. *The Qualitative Report, 23(11)*, 2622-2633. Retrieved from
https://nsuworks.nova.edu/tqr/vol23/iss11/2

[30] D. Compton, T. P. Love & J. Sell. (2012). Developing and assessing intercoder reliability in studies of group interaction. *Sociological Methodology,42*, 348-364. DOI : 10.1177/0081175012444860

[31] H. Zade, M. Drouhard, B. Chinh, L. Gan & C. Aragon. (2018). Conceptualizing disagreement in qualitative coding. *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, 159*, 1-11. DOI : 10.1145/3173574.3173733

[32] J. Saldana. (2016). *The coding manual for qualitative researchers.* Los Angeles, CA: SAGE.

[33] J. W. Creswell. (2014). *Research design: qualitative, quantitative, and mixed methods approaches.* United Kingdom: Content Technologies.

[33] E. T. Hall. (1981). *Beyond culture.* New York, Anchor Books.

[34] G. Hofstede. (1980). *Culture's consequences, international differences in work-related values.* Newbury Park, CA SAGE.

[35] G. Youn, B. G. Knight, H-S. Jeong, & D. Benton. (1999). Differences in familism values and caregiving outcomes among Korean, Korean American, and White American dementia caregivers. *Psychology and Aging, 14(3)*, 355-364.
DOI : 10.1037/0882-7974.14.3.355

[36] D. Segura & J. L. Pierce. (Autumn 1993). Chicano/o family structure and gender personality: Chodorow, familism, and psychoanalytic sociology revisited. *Signs, 19(1)*, 62-91.

[37] N. R. Hooyman & H.A. Kiyak. (2011). *Social gerontology: A multidisciplinary perspective* (9th ed.). New York: Pearson.

[38] R. Ormerod. (2006). The history and ideas of pragmatism. *Journal of the Operational Research Society, 57*, 892-908.
DOI :10.1057/palgrave.jors.2602065

[39] E. Meyer. (2014). *The culture map: Breaking through the invisible boundaries of global business.* New York, NY: Public Affairs.

[40] S. Trepte & P. K. Masur. (2017). Need for Privacy. In: Zeigler-Hill V., Shackelford T. (Eds) *Encyclopedia of Personality and Individual Differences.* Springer, Cham. DOI : 10.1007/978-3-319-28099-8_540-1

[41] I. Altman. (1975). The Environment and Social Behavior: Privacy, Personal Space, Territory, Crowding. Monterey: Brooks/Cole Publishing Company.

[42] A. F. Westin. (1967). Privacy and Freedom. New York: Atheneum.

[43] AARP. (2018). Where WeLive: Communities for All Ages. AARP, Washington DC.

[44] Hofstede Insights (2021). Country Comparison. https://www.hofstede-insights.com/country-comparison/south-korea/

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