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Identifying Needs for Ankle-Foot-Orthosis and Orthosis Provision Services Through Interview Analysis of Japanese Stroke Patients

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Abstract
Japan has approximately 1.74 million stroke patients, accounting for 16% of the elderly (age ≥ 65) who are eligible for nursing care. Stroke patients with lower limb disabilities often use a short-foot orthosis as a tool to improve their balance and walking ability. However, some ankle-foot-orthosis users stop using them and suffer a decline in their activities of daily living (ADLs). Therefore, understanding the needs of users is essential; however, only a few studies focused on this aspect have been reported in Japan. The purpose of this study was to interview stroke patients who use an ankle-foot-orthosis and to investigate the needs and difficulties experienced while using orthosis and orthosis services. Semi-structured interviews were conducted and the user's thoughts and opinions were extracted using steps for coding and theorizing. We extracted the benefits that stroke patients hoped to gain from wearing a ankle-foot-orthosis, the areas in which they desired improvements, such as the structure of the orthosis, and the anxieties they experienced while using the orthosis. We believe that by addressing these issues and modifying the orthosis to overcome the limitations of the current design, we can provide better orthosis and services to ankle-foot-orthosis users.

Keywords: Ankle-Foot-Orthosis, Interview Analysis, Stroke Patients

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Introduction

Current status of ankle-foot-orthosis for managing the sequelae of a stroke

Stroke is a condition wherein the breakdown or blockage of blood vessels in the brain—cerebral hemorrhage (bleeding) or cerebral infarction (blockage due to blood clots)—impairs the functions of the central nervous system. Japan has approximately 1.74 million stroke patients (Ministry of Health, Labour and Welfare, 2022), accounting for 16% of all patients requiring long-term care in Japan and second only to the number of patients with dementia (Ministry of Health, Labour and Welfare, 2020).

Many stroke patients suffer from spastic paraplegia, or hemiplegia, in which the upper and lower limbs on both sides of the body are paralyzed, affecting the patient's ability to stand and walk smoothly. The patient's impaired mobility is a critical factor leading to their care-dependent condition, and various interventions, including rehabilitation, are being used to improve such conditions. One such intervention is the use of an ankle-foot-orthosis (Figure 1).

Figure 1: An Ankle-Foot-Orthosis

The acute rehabilitation section in the Japanese Guidelines for the Management of Stroke (2021) states that "Active rehabilitation, including early sitting/standing training, early gait training with an orthosis, feeding and swallowing training, and self-care training, be provided as early as possible after the onset of stroke under appropriate risk management." This recommendation for early rehabilitation after the onset of stroke is graded A, that is, it is strongly recommended to be implemented.

The section on Rehabilitation for Gait Disorders states that "It is reasonable to use an ankle-foot-orthosis to improve gait function in hemiplegic patients with hemiparesis due to stroke and a medial apogeotropic foot." This recommendation is graded B, that is, it is moderately recommended and considered reasonable to use. Thus, the use of an ankle-foot-orthosis during rehabilitation is considered an effective treatment method.

Many patients continue to use ankle-foot-orthosis in their daily lives after treatment to overcome the functional decline caused by residual hemiplegia. The use of an ankle-foot-orthosis by stroke patients during their daily activities is effective in improving their walking and balancing abilities, as evidenced by the scores for items other than the sitting position on the Berg Balance Scale (Muraguchi et al., 2013).

Status of the reflection of user intentions for products and services in other areas

In the fields of human factors and Kansei engineering, the importance of a human-centered design, with emphasis on factors such as "what users want" and "how they feel when using a product or service," is growing (Hashida, 2020). Creating a product or service with a human-centered design necessitates investigating the users' requirements and performing a user-centered evaluation. The users' intentions are reflected in their evaluation of the products and can be used for improving the products and services to meet the users' needs.

In the related field of service engineering, making users feel "extremely valued" or creating products and services "beyond their expectations" to promote "customer delight" is essential. In designing and delivering "excellent services" that make users feel delighted, the concept of co-creation, which involves listening to, engaging in dialog with, and reflecting on the voices of users, is indispensable (Ministry of Economy, Trade and Industry, 2021).

Current situation of orthosis non-use and purpose of this study

In Japan, a doctor's prescription is required to fabricate an orthosis. Therefore, in most cases, the decision on what type of orthosis is appropriate for the user is based on discussions among medical professionals, such as the physician who decides on the overall treatment plan, the physiotherapist who evaluates the physical condition and performs physical therapy, and the prosthetist and orthotist who manufactures and provides the orthosis. This situation is unlike that in other fields such as human factors and service engineering.

It has been suggested that these situations, wherein the users' intentions are not fully considered, are a factor in the non-use of orthosis (Ando, 2020). According to previous reports, approximately 30% of patients discontinue the use of orthosis after being discharged from the hospital (Hanagata & Sone, 2006). Abandonment of assistive devices is an issue that needs to be addressed because it not only causes a decline in the user's activities of daily living (ADLs) but also promotes negative spillover effects in society (Phillips & Zhao, 1993).

In this study, semi-structured interviews of ankle-foot-orthosis users in Japan were conducted to identify the need for improving an orthosis, the array of orthosis provision services currently available, and the factors that need attention and improvement in the provision of orthosis. We also sought to identify the interactions with orthotists and prosthetists and experiences with an orthosis that may have influenced users' needs and impressions of the orthosis and orthosis provision services.

Methodology

Subjects and Ethical Approval

This study included six patients (five female and one male) who lived in Japan and used an ankle-foot-orthosis in their daily lives to manage the sequelae of a stroke. The median age of the subjects was 59 years (52.00–72.75).

Ethical considerations were made in obtaining cooperation for this study. To protect the human rights of the subjects, we explained that participation in the survey was not mandatory, the interview data would not be used for other purposes, individuals would not be identified from the data during and after analysis, and subjects would not be penalized for not answering or stopping questions they did not want to answer.

This study was ethically reviewed and approved by the Hokkaido University of Science (Approval number: 595).

Interviewing and data analysis methods

After informing the subjects that the interview would last approximately 30 min, a semi-structured interview was conducted using an interview guide developed through discussions among researchers.

The subject was asked to freely choose an environment where he/she felt mentally comfortable and where there were few obstacles to the interview. Consequently, one subject was interviewed at home, one at a day service center, one at his/her university, and three were interviewed over the telephone. With the permission of the subjects, all statements were recorded on an Integrated Chip recorder and converted into audio data.

The audio data of the interviews were converted into text and used for data analysis based on the Steps for Coding and Theorization (SCAT). SCAT is a qualitative analysis method that provides theoretical descriptions (what can be said as a result of the analyzed data) after separating the textualized speech data from utterance by performing the following four coding steps (Otani, 2011):

Step 1: Extract words and phrases of interest from the text.
Step 2: Paraphrase the extracted words and phrases.
Step 3: Present concepts not represented in the text that might explain the paraphrased phrases.
Step 4: Describe the constructs (themes) taking into account the context of steps 1 to 3 and the conversation before and after.

Based on the constructs (themes) described in Step 4, a storyline was written out as a series of sentences, which were then re-fragmented to produce a theoretical description.

Results

The median interview time was 30.5 min (27.25–47.25) per person or approximately 222 min for the six subjects in total.

The SCAT-based descriptions of orthosis and orthosis provision services are presented in Tables 1 through 4, grouped by category.

A total of 77 theoretical statements related to orthosis and orthosis provision services were classified into four categories: "perceived effectiveness of an orthosis," "need for an improved orthosis," "need for services," and "impacts of an inadequate professional response."

We obtained 16 theoretical statements related to the "perceived effectiveness of an orthosis" (Table 1), 26 related to the "need for an improved orthosis" (Table 2), 11 related to the "need for services" (Table 3), and 24 related to the "impacts of an inadequate professional response" (Table 4).

Perceived Effectiveness of an Orthosis
• The user feels anxious about removing an orthosis and feels that the orthosis is necessary for walking and is indispensable for his/her life. • The user feels that an orthosis is an indispensable tool for living with a disability because it provides stability when standing and walking. • Wearing the orthosis indoors results in a smooth indoor gait. • The reduced gait speed and stability associated with not using an orthosis makes the user choose to wear the orthosis at all times, except when sleeping, even during a leisurely day. • The ability to walk faster and stand on their feet with the help of an orthosis gives the user a sense that the orthosis is useful and can lead to a higher degree of independence. • Smooth walking with the help of an orthosis gives the user the freedom to walk in various environments. The feeling of "I have to have the orthosis" leads to continued use of the orthosis outside of leisure activities and makes the user independent in performing most household chores. • The feeling of dependence on the orthosis when going out creates an opportunity to wear the orthosis in proportion to the opportunity to go out. • The user feels useful and satisfied with the orthosis when going outside. • The user feels satisfied with the orthosis when going outside. • Fear of going outside without the orthosis limits the user to a very limited range of activities. • The use of the orthosis in daily life allows the user to go out for a variety of purposes, participate in routine household chores, and socialize for pleasure. • The reduced gait speed and stability associated with not using an orthosis limits the user to a limited range of indoor activities. • Fear of not being able to walk to the best of one's ability leads the user to choose an orthosis to reduce anxiety. • Ankle instability in non-orthotic situations may lead the user to choose orthotics to reduce anxiety. • The reduction in anxiety and the perceived benefit of the orthosis for standing and walking will give the user a sense of the orthosis's efficacy.

Table 1: Theoretical Descriptions Categorized as the "Perceived Effectiveness of an Orthosis"

Need for an Improved Orthosis
• The user is dissatisfied with the lack of freedom to choose footwear. • The experience of being deprived of the freedom of footwear choice due to an orthosis that makes the foot appear larger than the bare foot can cause significant discomfort to the user and may lead to envy toward other people's footwear. • The user's desire for freedom of footwear choice may be related to frustration over the time and effort required to put on footwear over the orthosis. • The user has a problem with not being able to choose footwear due to the orthosis and feels most uncomfortable with the lack of footwear that fits the orthosis. • The user has a desire for good-looking shoes and is reluctant to go out in shoes that lack design. • The lack of available footwear for the user's needs accelerates the user's indifference to the appearance of the footwear because the user places the highest priority on footwear that fits the orthosis. • Users who wear orthosis that are difficult to accommodate inside standard footwear have a desire for orthotic designs that offer a choice of footwear. Complaints about the fashion implications of clothing choices that tend to hide the orthosis. The user's desire not to be noticed while wearing the orthosis leads to the choice of clothing that can easily hide the orthosis. • Users are dissatisfied with the negative impact of the orthosis on their clothing choices, especially the reduced variety of pants that can be worn over an orthosis. • The user's experience of difficulty putting on and taking off shoes while wearing the orthosis leads to a desire to use orthosis that allow freedom of clothing choice. • The user has the desire to use a variety of orthosis, including less glamorous orthosis for everyday use and more fashionable orthosis for going out. • They believe that the appearance of their orthosis is important to their use. • The user has a positive impression of the appearance of the orthosis he or she is wearing and wants to be able to use the orthosis without having to hide it. • The weight of the orthosis when the user wears it for the first time makes the user think that lightness is important for daily use of the orthosis and gives the user the impression that the orthosis is "light" for his/her use. • The user feels that the orthosis is too heavy to handle. • The user feels that the weight of the orthosis makes it difficult to handle, even though he/she has learned to put on and take off the orthosis in a short time through years of use. • The user has a desire for greater independence in wearing the orthosis. • The ability to wear and manage the orthosis independently leads to less stress for the user. • The ability to use the orthosis without pain leads to a greater sense of satisfaction with the use of the orthosis. • The ability to wear an orthosis helps reduce the amount of time and effort required to use the orthosis. • Simple orthosis gives the user the impression that the orthosis is light and easy to put on and take off. • Simple orthosis will make the user want to use a lightweight orthosis. • The user may be able to detect damage to a simple orthosis but may not be able to detect damage to a complex orthosis. • The user is not aware of the risk of breakage of a complex orthosis. • Dissatisfaction with the "lifespan" of the orthosis can lead to the user's habit of regular orthosis fabrication and a feeling of resignation and compromise about the durability of the orthosis.

Table 2: Theoretical Descriptions Categorized as the "Need for an Improved Orthosis"

Need for Services
• The user has a desire for better orthosis design suggestions from prosthetists and orthotists and a desire for orthosis fabrication that meets his or her needs. • The user feels it is important to have the opportunity to meet with a prosthetist or orthotist to obtain information about the orthosis. • Long-term use of an orthosis with the same shape may trigger a desire for suggestions on making functional modifications to the orthosis. • The lack of access to information about the orthosis from an orthotist and the fact that the specifications of the orthosis have not changed since the start of use may lead to a desire to know which orthosis option is right for the user. • The user has a sense that the orthosis can be improved, even after the user has become familiar with it, and has expectations for new orthosis that will be created in the future. • The user wants the orthosis to be repaired as it wears out due to the hazards associated with wear and tear. • The user has a desire for follow-up care, such as home repairs by a prosthetist and orthotist. • The user is aware of the need for regular maintenance of the orthosis. • The follow-up services, such as mold making and home visit repairs, give the user a positive impression of the orthosis company and a reason to recognize it as a responsive orthosis company. • Contacting an orthotics and prosthetics company through a therapist may create a situation where the user does not have access to an orthotics and prosthetics company on their own or can only communicate with an orthotics and prosthetics company in a hospital setting, which may lead to a desire for the services of an orthotics and prosthetics company in a setting other than a hospital. • The user's desire for contact with an orthotist regarding the orthosis is based on the apparent problem with the orthosis and not the frequency of contact.

Table 3: Theoretical Descriptions Categorized as the "Need for Services"

Impacts of an Inadequate Professional Response
• Lack of opportunity to compare the user's orthosis to other orthosis can lead to the perception that there is only one type of orthosis. • Lack of expectation of what an orthosis should look like. • Lack of explanation of the need for orthosis by the prosthetist and orthotist can lead to negative feelings about the use of an orthosis. • Lack of explanation of the orthosis-related system by the prosthetist and orthotist makes it necessary to contact the prosthetist and orthotist through a third party. • Lack of a clear explanation of the purpose of the orthosis makes it difficult for the patient to understand the details of the purpose of the orthosis. • Physical therapists and prosthetists who do not respond sincerely to consultations about the patient's physical condition break the patient's trust such that even if the patient has a contact person for consultations about the orthosis, he/she may not want to discuss it with them. • The patient may mistrust the prosthetic company due to poor fitting or fitting by an injured prosthetist or orthotist. • The experience of being turned down for follow-up makes the prosthetist angry that the orthotist is not following up, leading to a feeling of resignation about follow-up by the prosthetist and orthotist, and a reason to fabricate the orthosis themselves. • If the patient is unable to contact a prosthetist or orthotist for an extended period of time, he/she may be concerned about orthosis failure or damage to the orthosis. • Contacting an orthotist or prosthetist through a third party may result in the patient not contacting the orthotist or prosthetist. • The user's understanding of the orthosis payment system is inadequate due to the lack of explanation of the orthosis payment system by the prosthetist and orthotist. • The user's understanding of the orthotic supply system is poor due to a lack of explanation of the system by the prosthetist. • Prosthetists and orthotists who do not suggest functional modifications may prescribe the same orthosis even when the deformity has progressed, leading to a sense of resignation that an ill-fitting orthosis is okay. • The user is unable to visualize the effect of the orthosis, leading to a sense that the orthosis is not as good as expected. • The user does not communicate directly with the prosthetist and orthotist, which may cause the user to seek orthosis repair services. • Lack of direct contact with the prosthetist and orthotist may cause the user to feel that they are not getting the follow-up care they need to continue using their orthosis. • The user's memory of the orthosis is vague, and without the opportunity for input into the specifications of the orthosis, the user may not be able to visualize the benefits of the orthosis. • The lack of direct communication between the user and the prosthetist and orthotist makes the user want to address orthosis problems before they occur. • The user is unfamiliar with and unaware of the orthosis fabrication process. • The user's weak relationship with the prosthetist or orthotist may result in the use of the orthosis beyond the end of its useful life. • The user's weak connection with the prosthetist and orthotist will result in an inability to deal with orthosis problems. • A weak connection between a prosthetist and an orthotist makes it impossible to contact the orthotist. • Lack of connection to a prosthetist and orthotist means that there is no follow-up on orthotic issues. • A lack of connection to an orthotist or prosthetist can leave the user uncertain about the continued use of the orthosis.

Table 4: Theoretical Descriptions Categorized as the "Impacts of an Inadequate Professional Response"

Conclusion

Theoretical descriptions in the "perceived effectiveness of an orthosis" category indicate that the perceived benefits for orthosis users are their improved ability to stand and walk, decreased anxiety in performing daily activities, and an increase in the range of activities that they can perform.

A user's sense of efficacy is important for the continued use of an orthosis (Ishiguro et al., 2011). The results of this study suggest that the use of an ankle-foot-orthosis may provide the users with a sense of efficacy by contributing to their ability to walk and stand, reducing their anxiety, and expanding the range of activities they can perform.

Theoretical descriptions in the "need for an improved orthosis" category indicate that users mainly value the minimal influence of an orthosis on their choice of clothes and shoes and prefer an orthosis with an impressive design. However, we cannot exclude the possibility that this factor was characteristically extracted because most of the subjects in this study were women. Other descriptions in this category suggested that users preferred an orthosis that is lightweight, easy to put on and take off, causes no pain or discomfort, has a simple structure that is easy to understand, and is durable and low maintenance.

Applying the theoretical descriptions extracted from "perceived effectiveness of an orthosis" and "need for an improved orthosis" to service quality items (Johnston & Clark, 2005) demonstrated that many of them can be categorized as hygiene factors. From the user's point of view, the satisfaction of these factors is taken for granted. The improvement of the orthosis structure and materials in addition to considering the user's physical functions and requirements, as recommended by a medical professional, will lead to a reduction in dissatisfaction and complaints by focusing on the elements in which the user is aware of the effectiveness of the orthosis and the needs of the orthosis itself.

The theoretical descriptions in the "needs for services" category indicate a desire to exchange information with an orthotist and prosthetist before and after orthotic services. Further examination of the descriptions revealed a desire to have their needs reflected in the orthosis and a desire to receive suggestions from the prosthetist and orthotist regarding functional modifications to the orthosis in light of their current physical condition. Therefore, it can be concluded that the reason users seek information exchange with the prosthetist and orthotist is to make the orthosis more suitable for their use. Other service needs include follow-up services such as repair and maintenance. Respondents also expressed a desire for more flexible service locations, such as home visits, instead of being limited to hospitals.

Similar to the two categories described above, applying the theoretical descriptions extracted as "needs for services" to service quality items (Johnston & Clark, 2005) confirmed that they include a large number of satisfaction factors. We believe that satisfying these needs will lead to increased user satisfaction with orthosis provision services.

The "impact of inadequate professional response" category, which encompassed factors that are thought to influence the impression and perception of the orthosis itself and the orthosis provision services, highlighted the issues of inadequate comparison of orthosis and inadequate explanation of the purpose of an orthosis by the prosthetist and orthotist. This can negatively impact the user's perception of the orthosis, what the orthosis will be like, and how it will benefit them, which can be detrimental to the co-creation of value between the user and the prosthetist and orthotist. Many of these problems can be resolved through a close exchange of information between the user and the

prosthetist and orthotist. We conclude that time-consuming communication before and after the provision of the orthosis is important and useful, both in terms of meeting the user's needs and in terms of eliminating problems related to the use of an orthosis.

Furthermore, as previously mentioned, five of the subjects in this study were women and only one was a man, and the possibility of gender bias in the theoretical descriptions obtained in this study cannot be ruled out. In addition, the subjects in this study have been wearing the ankle-foot-orthosis for a long time, and we were not able to interview those who decided not to use the orthosis. Therefore, in the future, we plan to conduct a similar study with more male subjects and former ankle-foot-orthosis users who decided to discontinue its use.

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Caring Communities – Ready for a Collaborative Approach to Dementia?

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Abstract
Old age, care dependency and dementia pose particular challenges to those affected and their families. This paper presents participatory approaches to face these challenges, both theoretical and practical, focusing on the concept of the Caring Community. One form of a Caring Community is the dementia-friendly community where people with dementia and their families find the acceptance and support they need. These communities are characterized, among others, by efforts to enable social inclusion and overcome stigmatization as well as an open approach to dementia in general. Several conditions need to be fulfilled for the successful social participation of a disadvantaged group (e.g., people with dementia) in a Caring Community. Among others, communities need to develop a fundamental social (e.g., dementia-inclusive) attitude which then translates into corresponding actions and behaviors. In addition, community members' understanding for and acceptance of people's needs and lived realities need to be improved. This paper discusses the experiences from a project in a small town in Austria which implemented awareness-raising, support and relief activities to improve the town's dementia-friendliness as well as dementia-inclusiveness. Highlighted are challenges with sustaining newly established meeting spaces and with activating people to engage in community efforts in times of the COVID-19 pandemic. Finally, the paper also touches upon the results of the participatory evaluation regarding the effectiveness of the project's activities.

Keywords: Caring Communities, Dementia, Dementia-Inclusiveness, Participatory Approaches

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Introduction

Demographic change, different age structures, and the associated issues of health, illness and social participation up to a very high age require considerations about ways to maintain a good life for all people in a community. As the members of a society grow older, the risks for illness and caregiving issues also increase. Traditionally, care in Austria has been provided and is still provided to a high extent by family members. This, in addition to the social, economic and emotional burdens of predominantly female family caregivers, is subject to future changes as life courses and employment histories increasingly change. With facing a rising number of dementia-related illnesses, questions how to handle this as a society become important. According to the latest data, approximately 55.2 million people all over the world were living with dementia in the year 2019 (World Health Organization, 2021). Caring Communities, a practical concept with a strong theoretical background, could lead to a collaborative approach to dementia. In line with this, the research question of this paper is how Caring Communities can create the necessary structures for a community to be ready for a collaborative approach to dementia.

First, this paper will give an overview on the concept of Caring Communities and the latest data about dementia. In addition, the social aspect of dementia and the signs on how to identify dementia are presented. The next part focuses on a participatory approach which was used and evaluated in a practical project designed to help establish a dementia-friendly municipality in the South of Austria. The findings from this project and its evaluation are discussed and summed up afterwards in the conclusion.

Caring Communities and Dementia

Under the term Caring Communities there are manifold approaches and international best practice examples summarized that differ depending on national structures in social and health sectors. The term Caring Community refers to a community of solidarity that includes formal networks but is built on informal and solidarity-based structures. Therefore, it is necessary to define what is meant by a Caring Community in each region, in each place. This definition depends on the type and nature of the region, on the specific circumstances and needs of the people in that region. The term Caring Community is therefore to be understood as a collective term for communities of solidarity (Wegleitner & Schuchter, 2021).

Caring Communities or community-based approaches are built on solidarity and empowerment. Caring Communities have a responsibility for all people within a community, the aim is shaping care for and together with citizens in difficult life situations. This could be very different life situations which are challenging for people in the community (e.g., health and social issues, like dementia). Caring Communities are also addressing the question of the conditions of a good life and a good life together with other people in the community. It must be analyzed what a good life means individually as well as in the context of a community. Abilities and opportunities for a good life for all members of a society have to be discussed. Caring Communities are about individuals and the communities as well as the network between these two positions (Wegleitner & Schuchter, 2021).

Topics of Caring Communities are mindfulness and justice for others and the whole, which means the individual person in the context of society. Creating a helpful culture as well as supplying structures is very important in the neighborhood. An essential question is: where is the community located and what stakeholders are in this neighborhood? This is also related to

different opportunities in a certain region depending, e.g., on rural or urban circumstances, infrastructure, the living conditions in a region (e.g., industrial), access to education, professional care etc. Furthermore, the different generations are very important: the topics of Caring Communities are intergenerational exchange as well as intergenerational justice. With keeping the different generations in a community in mind, this concept could also prevent loneliness especially in an older age. An active care culture in different places and institutions is another topic of Caring Communities (Wegleitner & Schuchter, 2021).

The handbook on Caring Communities (Wegleitner & Schuchter, 2021), which was created and published in Austria, gives guidelines for and of Caring Communities. Important keywords are trust, empowerment, enabling, offering and accepting help as well as multipliers in the community. First of all, it should be highlighted that trust is the basis for working together in a community and also for networking within the community. Without trust it is not possible to offer or to accept help. Furthermore, trust is linked to empowerment too: on the one hand oneself empowerment to have the ability for active acting, and on the other hand trust in the knowledge that a community or society is offering the frameworks for empowerment. This is not only relevant for the older generation but is an important part of intergenerational exchange and justice. Enabling means maintaining one's own capacity for action and using it in the community. Multipliers in the community offer peer-to-peer support, peer counseling and low-threshold opportunities for enabling a help and care culture in the community (Wegleitner & Schuchter, 2021).

Beside this, exchange dialogues and places of care are main keywords in the context of Caring Communities and basic principles for creating a help and care attitude. For multipliers, stakeholders as well as anybody within a community it is essential to know where the places of care are. Where to go and where to meet relevant people should be very easy and transparent when someone is facing a problem. Therefore, the highest possible diversity should be taken into account in a specific region; inclusive structures for all people in the community are needed for Caring Communities to work in everyday life. With people getting older, poverty and questions of welfare systems and political arrangements also become relevant. In this context, Caring Communities can prevent poverty and support a good life within society, even up to a very high age, using community capacities (Wegleitner & Schuchter, 2021).

When talking about the concept of Caring Communities in the context of dementia, it is essential to keep in mind that the concept and also the consequences of dementia should be seen on the individual level (micro), the institutional level (meso) as well as the societal and political level (macro). Without this it is not possible to discuss appropriate strategies for dealing with a rising number of dementia-related illnesses and their special consequences for the society as a whole. According to this, the next section will highlight some facts about dementia. After that, it will be discussed how Caring Communities can help in a society where the number of people with dementia is expected to increase in the next few years.

Approximately 55.2 million people all over the world were living with dementia in the year 2019. Most affected people live in the western pacific region, i.e., in Australia, New Zealand, Japan, China, Philippines and Mongolia. Europe follows in the second place with 14.1 million people affected by dementia. Dementia is not a specific disease, it is a group of symptoms which affect memory, behavior, thinking, social skills, a person’s activities of daily life (ADLs) as well as their social autonomy. When talking about the concept of Caring Communities within a society, empowerment, participation and autonomy are important

factors when creating dementia-inclusive structures (BMASK, 2011; World Health Organization, 2021; Deutsche Alzheimer Gesellschaft e.V., 2022; Juraskovich & Ostermann, 2012; Nagl-Cupal et al., 2018; Robausch & Grün, 2015; Sütterlin et al., 2011; Wancata, 2015; Webster, 2021).

There are many different types of dementia. The most common types are Alzheimer's dementia, vascular dementia, Lewy body dementia, frontotemporal dementia and early-onset dementia. Alzheimer's dementia is the most common type and it affects people who are 65 years or older. No matter what type of dementia, this disease influences many areas of life, in personal and societal spaces not just of those who are affected but also of their relatives and (other) carers (BMASK, 2011; World Health Organization, 2021; Deutsche Alzheimer Gesellschaft e.V., 2022; Juraskovich & Ostermann, 2012; Nagl-Cupal et al., 2018; Robausch & Grün, 2015; Sütterlin et al., 2011; Wancata, 2015; Webster, 2021).

In order to be able to act appropriately, it is necessary to recognize dementia early enough so that needs-matching framework conditions, also within caring communities, can be set. Alzheimer's disease international recommends to pay attention to ten warning signs of dementia: The first warning sign is memory loss. Most people are familiar with this first sign, to forget daily life facts or appointments. The second sign is difficulty to performing familiar tasks, like preparing a meal or doing other activities in the household or garden. The third warning sign are problems with language, e.g. forgetting simple words. Fourthly, to face disorientation in time and place, is another warning sign: People with dementia can get lost in their own streets. Fifth, poor or decreased judgement is also a warning sign. For example, people are wearing heavy clothes even though it is very hot outside. Next, having problems with keeping track of things is another warning sign. For example, this could be official appointments, regular doctors' appointments or knowledge of important telephone numbers or addresses. Another sign is misplacing things, for example, putting the key in the fridge. Changes in mood and behavior are not very well known, but they are also very important when talking about dementia. People living with dementia also have big problems with coordinating visual and spatial information, e.g., when driving a car or using public transportation. The last warning sign is withdrawal from work and social activities, that means people become passive and disinterested in activities which they were used to do (Alzheimer´s Disease International, 2017).

Within Caring Communities, these ten warning signs can be taken into account to create a dementia-inclusive society, and also serve to identify at an early stage which structures are required. Preparation in a community and the creation of appropriate structures for awareness raising and inclusion building are ongoing processes and should not be installed only when there are many cases of, e.g., dementia in a community. Connected to this, the next chapter will focus on a participatory approach based on a practical example, where this was the basis for installing a Caring Community.

Participatory Approaches: Practical Project Dementia-Friendly Municipality

This chapter wants to introduce a research and development project based on the concept of Caring Communities with a special aim on the dimension of dementia-inclusive structures. The research and development project took place in a small town in the South of Austria, with the aim of fostering a Caring Community especially for people with dementia and their relatives. The participatory approach had the aim to create this together with the people in the community, so the project was designed and implemented together with the community. The

the jointly developed activities and methods were aimed to raise public awareness of dementia with the focus on supporting those affected and their family members. One form of a caring community is the dementia-friendly community where people with dementia and their families find the acceptance and support they need. These communities are characterized, among others, by efforts to enable social inclusion and overcome stigmatization as well as an open approach to dementia in general (Perchtaler et al., 2022).

The participation methods used during the project phase were an open citizen forum, stakeholder workshops, a future conference, events for the general public, such as a dementia march or lecture series, various training courses and the establishment of inclusive meeting spaces such as a dementia café. An intergenerational approach was in the focus of all these activities. (Perchtaler et al., 2022).

In the context of the scientific monitoring of the project, participants, actors and people living in the residential environment were also interviewed about their needs and the measures implemented. A small group of actors was also actively involved as co-researchers in a peer-to-peer survey in the residential environment. The results indicate positive developments towards a caring community primarily due to the positive acceptance and sustainable anchoring of the activities, the longterm commitment of stakeholders and the participation of affected families together with nonaffected families (Gruber & Hagendorfer-Jauk, 2020).

From our experience, several conditions need to be fulfilled for the subject of participatory approaches in the context of Caring Communities and dementia. Successful social participation of a disadvantaged group, like people with dementia, in a Caring Community is successful when communities develop a fundamental social attitude towards inclusion. This is the basis for all corresponding actions and behaviors. Key findings, which have been collected during the one-year period of preparation, the two-year project phase of conduction and now already 2.5 years post project collaboration, are defined and summarized as framework conditions for success. It needs newly established meeting spaces where people can meet each other within a community. Furthermore, it is also essential to actively engage people in their community, especially in times of crisis, like the COVID-19 pandemic. So, one of the basic elements is to develop a social attitude and dementia-inclusive attitude in the region (Perchtaler et al., 2022).

Social participation in the communal environment is a current and important issue in social coexistence. Particularly in the area of dementia, it is essential to involve those affected and their relatives in the community and to develop capacities in the sense of a shared culture of care in a community or neighborhood. Care networks in the municipal environment can be developed and strengthened through continuous initiatives that are linked to the current circumstances and challenges (capabilities). Participatory care networks should be promoted and professionally supported, the concept of Caring Communities with its framework can help to promote this (Perchtaler et al., 2022).

Conclusion

Based on the underlying research question of this paper, the following conclusions can be drawn. Participatory approaches offer great opportunities in the context discussed above because they can improve community capacity building for the whole community as well as the neighborhood. These approaches access also the needs of those affected by dementia and their relatives. Individuum-oriented support solutions which are strongly needed for this

target group can be established with the help of transdisciplinary research and a development team which helps directly in the community. Co-work between science and practice could be engaged in this way. It is essential to have guiding principles: it is necessary to work and collaborate together in the community to establish a common working framework which is understood and supported by all the members who are participating. Then it is possible to establish diversity sensitive methods of participation and to indicate communication formats and the support needed for all stakeholders and target groups. With this, Caring Communities and participatory research can help to design a collaborative approach to dementia, which is rooted in and strongly connected to the needs of those affected as well as their caregivers and relatives.

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Family Supports Between Older Parents and Adult Children in Thailand

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Abstract
The main purpose of the paper was to investigate the manifest family solidarity of older persons in Thailand and to analyze the typology of support between older parents and their adult children using the Latent Class Analysis (LCA). The data from Wave 2 (2017) of the longitudinal panel household survey on Health, Aging, and Retirement in Thailand (HART) were employed for the cross-section analysis.
Results: Three aspects of solidarity revealed that when parents were advanced in age, the solidarity in each aspect or the interrelationship with adult children would tend to increase, in terms of co-residence with children, frequency in contact with children, or the role of sole *"*recipients*"* of resource assistance from children. The solidarity indicators had a higher share with the oldest-old parents compared with the young-old and the mid-old parents.
The analysis of LCA revealed the four types of support between older parents and adult children in Thailand were *"*Detached*" "*Sociable" "Tight knit*"* and *"*Normative.*"* Overall, filial gratitude towards parents still existed in the Thai society. But behavior might change from the old pattern of children's assistance and support both in cash and in kind to parents to at least in regular contact with parents or to parents exchanged assistance in kind. This changing behavior reflected the adaptation to the changing society, while familial support to older persons tended to become long-term care. As older persons might relate to many generations of family members, closing the gap between generations should be a policy suggestion.

Keywords: Family Solidarity, Intergenerational Transfers, Older Persons, Thailand

Introduction

To improve the wellbeing of older persons under the rapidly increased number and share of older population globally and in Thailand are a crucial policy challenge in the 21st Century. Related to the ageing population, the Sustainable Development Agenda of the United Nations with the 17 Sustainable Development Goals (SDGs) indicates that the preparing for ageing population is essential to the achievement of the integrated 2030 Agenda since ageing cutting across the goals on poverty eradication, good health, gender equality, economic growth, decent employment, and sustainable cities and communities (United Nations, 2015, 2017). In the implementation of the agenda in order to achieve truly transformative, inclusive, and sustainable development outcomes, it is important to recognize older persons as the active agents of social development beyond treating them as a vulnerable group. (United Nations Development Programme, 2017).

One important recommendation for the recognition of older persons as such by the UN Madrid International Plan of Action on Ageing (MIPAA) for handling the issue of ageing in the 21st-century and for building a society for all ages was a solidarity of people of different generations and ages in all levels, as well as participation in sustainable development, which would form a foundation leading to the society of people of all ages and resulting in social cohesion. The interaction and support between people of different generations must start at the family level. Likewise, the relationship both formal and informal, between older persons and their surrounding people (e.g., family members, neighbors and friends, and services providers) was one major component to ensure healthy ageing and well-being of older persons to achieve the UN Decade of Healthy Ageing (2020 – 2030) (World Health Organization, 2019).

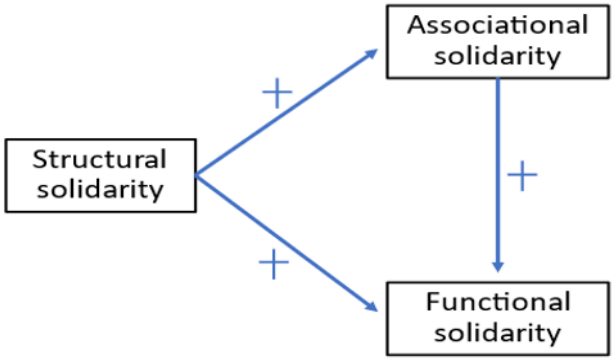
The research study on aging population and generational economy in 17 countries by Lee & Mason (2011) identified three supporting sources of capital for older persons (aged over 65 years), i.e., public transfers, private transfers (family transfers), and asset-based allocations of the older persons themselves. As for Thailand, the main resource for the support of the older persons is family transfers, followed by asset-based allocations. The public transfers constitute a small share.

Based on such reasons, the paper is to investigate the family support system of Thai older persons. The strength of this type of support system was based on the foundation of close relationship or solidarity of the members in the same family which constituted intergenerational relationship. Such a relationship between older parents and adult children was complicated and multi-faceted as there were various theories used to explain the relationship. The paper consisted of two objectives: (1) to investigate the solidarity of the older persons' family in Thailand especially the concrete dimension such as structural solidarity, associational solidarity, and functional solidarity and (2) to analyze the typology of support between older parents and their adult children in Thailand. To accomplish the objectives, the comparison among the young-old (aged between 60 - 69 years old), the mid-old (aged between 70 -79 years old), and the oldest-old (aged 80 years old or over) was conducted.

Solidarity model of intergenerational family members

The conceptual solidarity model in this study was based on the manifest solidarity reclassified by Silverstein & Bengtson (1997) from the original six dimension of the

relationship between intergenerational family members of McChesney & Bengtson (1988). The manifest solidarity was part of the behavior that involved interactions between intergenerational family members. It is composed of associational solidarity, functional solidarity, and structural solidarity. The **associational solidarity** involved pattern and frequency of communication between intergenerational family members, while the **functional solidarity** involved assistance of both givers and recipients between intergenerational family members and exchange of the assistance covering cash and in kind, daily activity care, and psychological support, and the **structural solidarity** involved physical closeness or co-residence of intergenerational family members which impact the opportunity of interactions between intergenerational family members. Figure 1 showed the relationship of the three aspects of solidarity (Rossi & Rossi, 1990).



Note: Revised from Rossi and Rossi, 1990.

Figure 1: Relationship among the three aspects of manifest solidarity

Study methods

The intergenerational relationship in the family solidarity model (shown in Figure 1) depended on the closeness of relationships in many aspects among members of different generations in the same family. The relationship was linked to the exchange of resources between younger family members and older family members. This study covered adult children aged 18 years old or over and older parents aged 60 years old or over. In terms of life-span developmental perspective, the exchange of resources or support between adult-older parent dyads could be both recipients and givers. Therefore, the support was bi-directionality and reciprocity.

To investigate the solidarity of the older persons' family in Thailand, five indicators were used to reflect two dimensions of associational solidarity and functional solidarity. Frequency of contact with children whether face-to-face meetings, telephone calls, or other communicative channels was the indicator for associational solidarity. Four indicators for functional solidarity were exchange of resources with children whether "in cash" or "in kind" and older parents as both "recipients" and "givers." These indicators were further used to analyze the typology of support between Thai older persons and adult children using the Latent Class Analysis (LCA). The analysis was also conducted on the typology of the support of the young-old, the middle-old, and the oldest-old parents.

Data sources

The study employed the available data from Wave 2 of the longitudinal panel household survey on Health, Aging, and Retirement in Thailand (HART)[1] for the cross-section analysis. The HART project involves a bi-annual survey starting with its baseline survey in 2015. The Wave 2 data was collected in 2017 (during January to June 2017). One household member aged from 45 and over from the baseline national representative household samples of 5,616 from 6 regions of Thailand, including Bangkok and vicinity, were interviewed. In Wave 2, the number of panel households or the total respondents interviewed was 3,708 with the response rate of 66.03% (Anantanasuwong, et al., 2018).

The data for analysis in the study were drawn from Part B of the HART database, "Family and Family Transfers: Wave 2 (2017)" and from the COVERSCREEN. The study focused on the data from the respondents aged 60 or over and who have at least one adult children (aged from 18 or over). Thus, the data were screened down to 2,739 eligible respondents with 1,079 respondents (39.40%) classified as the young old aged 60 - 69, 897 (32.75%), the mid-old aged 70 -79, and 763 (27.85%) the oldest old aged from 80 or over.

Study Findings

Family support from adult children to older parents in terms of the three aspects of manifest solidarity were described and the typology of family support yielded by LCA was presented.

Structural solidarity

Intergenerational solidary is defined as physical closeness or co-residence between older parents and adult children. Whether the parents resided with their children or not would impact the opportunity of interactions and mutual support between members of the same household. The intergenerational solidarity, therefore, would benefit both older parents and their children.

From Table 1, more than half of the older persons co-resided with their children. This was in line with the findings from the Survey of Older Persons conducted by National Statistical Office. The Surveys also provided the trends of the co-residence between 1986 and 2011 decrease on a continuous basis (Knodel, et al., 2013). Compared to other countries in Asia, the share of older persons co-resided with their children would be more serious than that in Thailand. In 1998, 46.6% of the older persons in South Korea co-resided with their children (Park, et al, 2005). In 2006, 48% of the older persons in Taiwan co-resided with their children (Yi & Lin, 2009). In 2012, 37.8% of the older persons in China co-resided with their children (CHARLS Research Team, 2013).

[1] The HART data are kept in a data archive and can be requested from the websites of Center for Aging Society Research (CASR) http://rc-demo.nida.ac.th/casr/ and NIDA Intelligence and Information Center (NIDA-IIC) http://iic.nida.ac.th/main/?page_id=564

Types of residence	Young-old (60 – 69 years old)	Mid-old (70 – 79 years old)	Oldest-old (80 years old or over)
Co-residence with children			
Resided with children	58.0	59.8	64.7
Did not reside with children	42.0	40.2	35.3
Types of family			
Single family	55.0	50.5	45.1
Extended family	39.9	44.0	51.0
No family/relative	5.2	5.5	3.9
Number of household members			
1	8.3	12.7	13.2
2	26.0	26.0	24.0
3	20.3	19.1	19.3
4	16.3	17.3	17.4
5	12.5	10.7	12.7
More than 5	16.6	14.2	13.3
Average number of household members	3.7	3.4	3.5

Table 1: Percentage of older parents distinguished by types of residence and age group.

However, the share of the older persons co-residing with their children increased with advanced age (shown in Table 1). Especially, the oldest-old parents who had limitations or health problems in terms of seeing, hearing, and moving, they needed assistance from their children, grandchildren, or caregivers in their daily activities of living. In extended family type, the share of living of the older persons increased according to the age groups whereas the share of living in single family decreased due to the death of their spouses, so they had to co-reside with their children and grandchildren instead. As for the number of household members of the older persons whatever age groups, the average members were approximately 3.5 persons. However, as the percentages of extended family tended to increase according to the older persons' more advanced age, and although the number of household members was stable, the composition or type of household members was different. This was in line with the findings from the Survey of Older Persons in 2014 (Knodel et al., 2015).

Associational solidarity

Associational solidarity between older parents and adult children who did not live together was measured through the indicator of frequency in contact and communication, whether visits, telephone calls, letters, email, or others. As shown in Table 2, almost half of the older persons or 41.9%, 42.5%, and 45.9% of the young-old, the mid-old, and the oldest-old parents, respectively, had contact with at least one child who did not live together every day or almost every day.

Contact	Young-old (60 – 69 years old)	Mid-old (70 – 79 years old)	Oldest-old (80 years old or over)
Number of times of contact with children a year			
Almost every day/every day	41.9	42.5	45.9
2 - 3 times a week	11.2	10.2	8.8
Once a week	12.2	10.1	9.9
13 - 51 times	8.1	6.3	6.5
Once a month	10.3	9.7	8.5
< 12 times	12.2	14.5	12.3
Never met	4.1	6.8	8.1
Locations of children's residence (compared with parents' residence)			
In the same subdistrict	12.1	17.4	22.8
In the same district	8.9	13.2	12.8
In the same province but in different district	15.5	16.2	19.1
In the different province	56.8	48.4	42.4
Others	6.9	4.8	3.0

Table 2: Percentage of the young-old, the mid-old, and the oldest-old parents with at least one child who did not co-reside with them distinguished by the frequency of contact and locations of residence

In terms of the distance from the parents' residence of the children who did not co-reside with them, from Table 2 the percentage of the older parents with at least one child who resided in the same subdistrict increased with the parents' advanced age.

Functional solidarity

The functional solidarity could broadly mean the level of exchange of services or assistance between intergenerational family members (Roberts, Richards & Bengtson, 1991). However, in this study, functional solidarity would specifically mean the mutual support between older parents and adult children. The mutual support would include both in cash and in kind, daily activity care, and psychological support. Moreover, from the life cycle perspective, the oldest-old parents who should be "recipients" after having performed main duties as "givers" was focused.

Based on Table 3, approximately 20% of older parents did not have any support with their adult children. The remaining 43-53% of them had mutual assistance with adult children. The share decreased with the parents' advanced age. Similarly, to the support as sole "givers" of the parents in their old age, the shares contributed to approximately 8%, 5%, and 4% of the parents aged 60-69 years old, 70-79 years old, and 80 years old and over, respectively. On the contrary, the parents who were sole "recipients" constituted approximately 18%, 25%, and 30% of the parents aged 60-69 years old, 70-79 years old, and 80 years old and over, respectively. The share of the sole "recipients" would increase with the parents' advanced age.

Directions of support/transfers	Young-old 60 – 69 years old	Mid-old 70 – 79 years old	Oldest-old 80 years old or over
One directionality	25.5	30.0	34.2
1. Parents were sole recipients	17.5	25.0	30.4
2. Parents were sole givers	8.0	5.0	3.9
Bi-directionality with parents as both recipients and givers	53.4	49.0	42.8
No support between parents and children	21.2	20.9	23.0
Total	100.0	100.0	100.0

Table 3 Percentage of the older parents distinguished by age groups and directions of support with children

The directions of support between older parents and adult children were distinguished by the indicators of the structural solidarity as detailed in Tables 4–6 for the young-old, the mid-old, and the oldest-old parents, respectively. The one directionality of the support would consider the perspective of the older parents, namely, “sole recipients” from adult children without giving to them.

For the young-old parents (Table 4), the directions of support distinguished by the number of living children revealed that the bi-directionality support between parents and children increased according to the number of the living children or increase from 51% (one child) to approximately 58% (more than five children) except for having four children. As for the case of no support, the lowest share was parents with two living children or 16.6% with the increase to approximately 20% in the case of having three children and increase to approximately 30% of the parents with four living children or more. The pattern of support between young-old parents and children was not vastly different between co-residence with children and without co-residence with children. Finally, with the division of types of family of the older residents, the share of the residents in extended family (55.8%) having the bi-directionality support with children was higher than the residents in single family (50.9%).

Indicators of structural solidarity	One directionality		Bi-directionality	No support	Total
	Sole recipients	Sole givers			
Number of living children					
1 child	14.4	10.6	51.0	24.0	100.0
2 children	19.6	10.1	53.7	16.6	100.0
3 children	17.2	6.4	56.4	20.1	100.0
4 children	21.0	3.7	45.7	29.6	100.0
5 children	7.9	5.3	55.3	31.6	100.0
More than 5 children	10.5	0.0	57.9	31.6	100.0
Co-residence with children					
Co-resided	17.7	8.3	50.6	23.4	100.0
Did not co-reside	17.4	7.8	54.9	19.9	100.0
Types of family					
Single family	18.2	8.6	50.9	22.3	100.0
Extended family	16.8	7.3	55.8	20.1	100.0
Total	17.5	8.0	53.4	21.2	100.0

Table 4 Percentage of the young-old parents (60 – 69 years old) distinguished by the directions of support and structural solidarity

Table 5 presented the directions of support of the mid-old parents. Considering the number of living children, the bi-directionality support between parents and children tended to increase according to the number of living children, similarly to young-old parents, but increased from approximately 42% (one child) to approximately 54% (three children and over five children) except the case of four and five children. As for the sole recipients of the parents of this age group, apart from the overview where the share was higher than the young-old parents, there was also more systematic change in the number of children or approximately 27% and 30% of the mid-old parents with one child and two children, respectively, who were sole recipients and approximately 21-25% of the parents with three children or more who were sole recipients. As in the case of no support, the pattern was similar to young-old parents. Approximately one-fourth of the older parents in both age groups had no support for children. The lowest share was the parents with two living children or 17.2% or the increase to approximately 21% in the case of having three and four children. However, the mid-old parents with one child had the highest share of no support with their child or 26%. As for the co-residence with children, approximately 28% of the mid-old parents co-residing with their children were sole recipients whereas 23.5% of those who did not co-reside with children were sole recipients. Finally, the share of those residing in extended family (50.6%) and having bi-directionality support with the children was higher than those residing in single family (47.3%). On the contrary, the older residents in extended family would have lower share of sole recipients than those residing in single family (23.6% and 26.6%, respectively).

Structural solidarity	One directionality		Bi-directionality	No support	Total
	Sole recipients	Sole givers			
Number of living children					
1 child	27.4	4.1	42.5	26.0	100.0
2 children	29.9	6.3	46.6	17.2	100.0
3 children	20.6	4.2	53.9	21.2	100.0
4 children	23.8	6.3	48.4	21.4	100.0
5 children	23.7	5.3	47.4	23.7	100.0
More than 5 children	24.6	1.5	53.8	20.0	100.0
Co-residence with children					
Co-resided with children	28.1	5.4	47.3	19.2	100.0
Did not co-reside with children	23.5	4.8	49.9	21.8	100.0
Types of family					
Single family	26.6	4.7	47.3	21.3	100.0
Extended family	23.6	5.3	50.6	20.6	100.0
Total	25.0	5.0	49.0	20.9	100.0

Table 5 Percentage of the mid-old parents distinguished by the directions of support and structural solidarity

From Table 6, considering the directions of support classified by the number of living children of the oldest-old parents, the trend of support of bi-directionality between parents and children decreased according to the number of living children which was contrary to the young-old and the mid-old parents. One important remark was that 26.5% of the oldest-old parents with one child, had bi-directionality support. The share of which was considered extremely low, whether compared with the oldest-old parents with more than one child or compared with the young-old and the mid-old parents with one child (51% and 42.5%, respectively). Moreover, for those with only one child, the no support from the child would be noticeably clear in the case of the oldest-old parents or approximately 37% of the oldest-old parents compared with 24% of the young-old parents and 26% of the mid-old parents. As for the sole recipients of the oldest-old parents, the trend increased with the number of living children except the case with two children. Finally, the support with children of the oldest-old parents did not depend on the co-residence with their children or the type of family.

Indicators of structural solidarity	One directionality		Bi-directionality	No support	Total
	Sole recipients	Sole givers			
Number of living children					
1 child	28.6	8.2	26.5	36.7	100.0
2 children	21.9	3.1	50.0	25.0	100.0
3 children	28.6	4.5	46.4	20.5	100.0
4 children	39.0	4.0	41.0	16.0	100.0
5 children	33.0	4.3	41.5	21.3	100.0
More than 5 children	30.3	2.1	42.8	24.8	100.0
Co-residence with children					
Co-resided with children	27.6	4.9	44.2	23.3	100.0
Did not co-reside with children	31.4	3.5	42.3	22.9	100.0
Types of family					
Single family	28.3	4.7	43.7	23.2	100.0
Extended family	31.9	3.2	42.1	22.8	100.0
Total	30.4	3.9	42.8	23.0	100.0

Table 6 Percentage of the oldest-old parents (aged 80 years old or over) distinguished by the directions of support and structural solidarity

The types of assistance that the older parents received from and gave to their adult children as shown in Table 7 revealed that whether the parents were the young-old parents, the mid-old parents, or the oldest-old parents, almost half or 45.0%, 45.1%, and 46.5%, respectively, received assistance from their adult children both in cash and in kind. The type of assistance received with lower share (14.2% - 16.9%) was in kind only. The lowest share (7.7% - 10.5%) was in cash only. Moreover, approximately one-third of the older parents did not receive any assistance from their adult children during the one year before the survey.

Types of assistance	60 – 69 years old	70 – 79 years old	80 years old or over
Parents were **"recipients"** of assistance			
In cash	10.5	9.9	7.7
In kind	14.2	16.9	16.4
Both in cash and in kind	45.0	45.1	46.5
Did not receive assistance	30.3	28.1	29.4
Total	100.0	100.0	100.0
Parents were **"givers"** of assistance			
In cash	4.3	5.7	3.7
In kind	36.0	35.1	36.1
Both in cash and in kind	19.8	12.5	5.4
Did not give assistance	39.9	46.7	54.9
Total	100.0	100.0	100.0

Table 7 Percentage of the older parents who were "givers" and "recipients" distinguished by age groups and types of assistance

In terms of assistance that the older parents provided to their adult children, in the year before the survey, approximately 40% of the young-old parents did not give assistance to their adult children. This share increased to approximately 47% of the mid-old parents and

approximately 55% of the oldest-old parents. The parents of the three age groups gave the assistance with similar shares or 35% – 36% to their adult children in kind only, and approximately 4 – 6% in cash only. The rest provided assistance to the children both in cash and in kind with the shares rapidly decreasing with the parents' advanced age or approximately 20% of the young-old parents, 12.5% of the mid-old parents, and 5.4% of the oldest-old parents.

Types of support between older parents and adult children

To classify the types of support between older parents and adult children, the five indicators reflecting the two dimensions of solidarity in the older person's family were used to analyze the typology of support by LCA. The LCA results for the overview of the support of the Thai older persons (n = 2,739) were classified into 4 types of support. Table 8 presented the latent class probability and the conditional probability[2] of the latent class models that divided the support between older parents and adult children into four types as summarized in Table 9.

Indicators	**Types**			
	1 **n = 1115** **41%**	**2** **n = 170** **6%**	**3** **n = 792** **29%**	**4** **n = 663** **24%**
Meetings				
Never/rarely	0.322	0.060	0.037	0.036
Often	***0.678***	***0.940***	***0.963***	***0.965***
Parents gave to children: in cash				
Yes	0	0.459	0.272	0.101
No	***1***	0.541	***0.728***	***0.899***
Parents gave to children: in kind				
Yes	0	0.483	***1***	0.186
No	***1***	0.517	0	***0.814***
Parents received from children: in cash				
Yes	0.022	0.279	***0.784***	***0.670***
No	***0.978***	***0.721***	0.216	0.330
Parents received from children: in kind				
Yes	0	0	***1***	***0.716***
No	***1***	***1***	0	0.284

Note: The Conditional probability which exceeded 0.6 were selected to represent the support of each type

Table 8 Results of the analysis of Latent Class Models with four classes: Overview

[2] The "latent class probability" was similar to prevalence, meaning the share of the elderly with distribution across types/classes of the support. For example, 41% of the total of 2,739 elderly persons had support in the first type. The "conditional probability" reflected the distribution within each class similarly to the factor loading which showed the relationship between the manifest indicator and the Latent class which would be given the "Label." The support of each type was based on this conditional probability, by interpreting only the conditional probability which exceeded 0.6.

Types of support	%	Definition of Support (Perspective of older parents)
1. Detached	41	Infrequent meetings with children, if at all. No support with children both in cash and in kind (i.e., the older parents were neither "givers" nor "recipients")
2. Sociable	6	Meetings with adult children occur often. The older parents are "givers" in the relationship and do not receive either cash or in-kind support from their children.
3.Tight-knit	29	Meetings with adult children occur often. The role of the "recipients" of support from children both in cash and in kind; as for the role of the "givers," assistance provided in kind only.
4. Normative	24	Meetings with adult children occur often. Older parents are "recipients" of support from adult children, both in cash and in-kind. They are no longer "givers" to their adult children.

Table 9 Types and definition of support between the older parents and adult children

From Tables 8 and 9 the type 1 "**Detached**" (the highest number of older people or 41%): The characteristic of the parents in this type was that there were few interactions with their adult children in terms of contact, transfer, or exchange of resources. The type 2 "**Sociable**" (the lowest share or 6% of older parents): The parents in this type would not receive assistance both in cash and in kind from their adult children. On the contrary, the opportunity to give money to adult children was higher than the older parents in other types. The type 3 "**Tight-knit**" (the share of 29% of older parents with adult children): The characteristic of the relationship was that the older parents received assistance both in cash and in kind from their adult children and that the older parents provided their assistance in kind to their adult children. Finally, the type 4 "**Normative**" (constituted 24%): The transfer of resources from adult children upward to older parents with adult children as guarantee in parents' old age.

The results of the LCA revealed that the model of the four types of support fit the empirical data most. However, the types of support for each age-group of the older parents were different as shown in Table 10.

Older groups	Types of support			
	Detached	Sociable/ Children who refused to grow up	Tight-knit	Normative
Young-old	46	5	28	21
Middle-old	31	27	42	
Oldest-old		46	54	
Total (Overview)	41	6	29	24

Table 10 Percentage of the older parents in each age-group distinguished by the types of support with adult children

1) For the young-old parents, the important characteristics of the relationship between the young-old parents and their adult children in the four types were similar as found

in the overall situation except for the "**Sociable**" type. The young-old parents did not receive any assistance from the adult children, they had to give assistance both in cash and in kind to their children even if they were adults. So, this type of support was called "**children who refused to grow up**."

2) For the mid-old parents, the characteristics of the three types of support namely the support of "**Detached**" type with 31%, the "**Sociable**" type with 27%, and the "**Tight-knit**" type with 42%. For the first and the last types, there were similarities in the overall aspect and in the young-old parents. As for the "**Sociable**" type in the mid-old parents, the parents would not receive assistance both in cash or in kind from children similarly to the overall situation and the young-old parents. The difference was in the "givers" whereby the share of the mid-old parents who did not give assistance in cash or any other assistance to their adult children was higher than in the overall situation.
3) Finally, for the oldest-old parents, the major characteristics of support were only two types, i.e., the "**Sociable**" type (46% of the older parents) and the "**Tight-knit**" type (54%). The percentage of the last type of support was slightly higher than the first type.

In sum, with parents' more advanced age, the types of support would decrease from the four types of the young-old parents to the three types of the mid-old parents and to the two types from the oldest-old parents. Two issues were noted. Firstly, the support of the "**Normative**" type in which the older parents were sole "**recipients**" appeared only in the youngest-old parents or 21% of them received support. Compared with the mid-old and the oldest-old parents, the young-old parents should have fewer needs than other ages. Finally, the "**Detached**" type with no mutual support between the older parents and adult children existed in the current Thai society, or almost half of the young-old parents and approximately one-third of the mid-old parents. As for the oldest-old parents, although without the "**Detached**" type, the "**Sociable**" type that the parents were "**givers**" in the relationship without receiving either cash or in-kind support from their children was similar. Only the latter "**Tight-knit**" type constituted more contact with the children.

Conclusion and Discussions

The study used the information from the HART project collected at the end of 2016 to the mid 2017 to analyze the manifest solidarity of the Thai older persons' families, as well as analysis of the types of the support between older parents and adult children by using the statistical technique of LAC. This analysis divided the sample into 2,739 parents into three age groups.

The findings from the three aspects of solidarity indicated when more parents were advanced in age, the solidarity in each aspect would tend to increase, including the issue of co-residence with children, frequency in contact with children, or the role of sole "**recipients**" of resource assistance from children. The indicators of these aspects of solidarity had higher share with the oldest-old parents compared with the young-old and the mid-old parents. It could be interpreted that with parents' more advanced age, the status of self-reliance would change to reliance on others especially on children in terms of economic, social, and health aspects. With the physical and mental degradation, needs of assistance and care would increase.

However, from the demographic perspective, the fertility rate in Thailand continuously and rapidly declined after the government's policy of birth control promotion in 1970. So, there might be argument that the oldest-old parents were in reproductive age before the period when the fertility level declined. Therefore, the Total Fertility Rate (TFR) meant the number of children that a woman had during her reproductive age (TFR ≥ 6 persons) would be higher than the young-old (TFR ≤3 persons) and the mid-old (TFR ≅ 4 - 6 persons) (Prasartkul, et al., 2011). Therefore, it resulted in higher interaction or support with children due to the higher turnover rate of children. But in considering the directions of support between older parents and adult children namely one directionality, bi-directionality, and no support and by comparing between the older parents of the three age groups with the same number of living adult children as shown in Table 11, it was found as follows.

Number of living children	One directionality		Bi-directionality	No support	Total
	Sole recipients	Sole givers			
1 child	14.4	10.6	51.0	24.0	100.0
	27.4	4.1	42.5	26.0	
	28.6	8.2	26.5	36.7	
2 children	19.6	10.1	53.7	16.6	100.0
	29.9	6.3	46.6	17.2	
	21.9	3.1	50.0	25.0	
3 children	17.2	6.4	56.4	20.1	100.0
	20.6	4.2	53.9	21.2	
	28.6	4.5	46.4	20.5	
4 children	21.0	3.7	45.7	29.6	100.0
	23.8	6.3	48.4	21.4	
	39.0	4.0	41.0	16.0	
5 children	7.9	5.3	55.3	31.6	100.0
	23.7	5.3	47.4	23.7	
	33.0	4.3	41.5	21.3	
More than 5 children	10.5	0.0	57.9	31.6	100.0
	24.6	1.5	53.8	20.0	
	30.3	2.1	42.8	24.8	
Total	17.5	8.0	53.4	21.2	100.0
	25.0	5.0	49.0	20.9	
	30.4	3.9	42.8	23.0	

Note: In each cell, the figures on the first row showed the young-old parents, the following row the mid-old parents, and the last row the oldest-old parents.

Table 11 Percentage of the young-old, the mid-old, and the oldest-old parents distinguished by the directions of support and the number of living children

1) With the same number of living children and with the parents' more advanced age, the parents' sole status of "**recipients**" tended to increase and the support of the "**Bi-directionality**" tended to decrease**.**
2) As for the overview of all age groups of older parents, the tendency of the parents' sole status of "**recipients**" did not increase according to the number of living children.
3) As in the case of "**no support**" between older parents and adult children, if there was only one living child, the share of the parents with no support with children tended to increase with their advanced age. Moreover, there was a higher risk that there would be no support with the child than older parents with more than one living adult child.
4) Finally, for the case of older parents with more than one living adult child, the share of parents with "**no support**" with adult children increased following the number of the living children.

Therefore, parents had more interactions with adult children with their advanced age due to the parents' physical necessity and/or economic reasons more than the fact that oldest-old parents had more children than mid-old parents or mid-old parents had more children than young-old parents. Moreover, the information from HART project in Wave 2 pointed out that considering the support that parents were sole "**recipients**" or in the case of both givers and recipients of "**Bi-directionality**" support, the number of two living children or more did not make any difference in the guarantee of security to the parents in their old age. On the contrary, if there was one living child, the security in old age would reduce. There was also a higher risk of no support with the child than the parents with more than one child. However, this study covered familial solidarity only in physical and concrete aspects of family solidarity.

The analysis of LCA revealed the four types of support between older parents and adult children in Thailand. The quality of intergenerational relationship between parents and children, which reflected the quality of children as well, could be ranked from low to high, namely "**Detached**" "**Sociable**" "**Tight knit**" and finally "**Normative**." Each type had the shares of the older parents as follows: 41%, 6%, 29%, and 24%. When compared with the study by Silverstein and Bengtson (1997), five types of support were concluded. These were (1) Tight-knit: Adult children had close relationship with parents in all studied aspects, (2) Sociable: Similarly to the first type except performing duties, i.e., no giving to parents or receiving assistance from them in kind, (3) Obligatory: Adult children regularly met with their parents but no close emotions or feelings, with adult children performed their duties, both giving to and receiving assistance from parents, (4) Intimate but distant: Adult children were spiritually close but other relationships were little, and (5) Detached: Contrary to the first type, low level of relationship in all studied aspects. Another study of Yi and Lin (2009) conducted in Taiwan showed five types of support similarly to the study of Silverstein and Bengtson, but with different indicators used in analyzing by the LCA. Firstly, the indicator of solidary on social norm was added. Secondly, performing duties covered both in cash and in kind. So, the third type was called Normative replacing Obligatory. The other types were similarly called due to their similar characteristics.

There were two differences between this study and the two mentioned studies. Firstly, this study used less solidarity indicators, but the two aspects covered by this study were particularly important and the behavior could be objectively measured. Secondly, the division of the types of support was conducted from the perspective of the older parents. But the two studies were conducted from the perspective of adult children. However, when comparing the types of familial relationship or support between older parents and adult children, similarity could be seen, especially in Taiwan, related as Tight-knit, Normative, and Detached. Although 'Intimate but distant' was an important characteristic due to spiritual closeness, this study did not have the indicator in this aspect.

Moreover, the types of family relationship of older parents in each age group were different. This was an important proof that during our life span, the intergenerational interaction was a dynamic process, depending on resources of children and needs of parents which were different in each age group of the interactive pair, as well as external limitations. These factors were determinants of the transfer of resources between each other. For example, when parents entered the young-old age, children were still at working age with income while parents did not have much need as they could still rely on themselves. The spouses were also alive so they could depend on each other. But if the parents were the oldest-old and the children started to become the young-old who were mostly retired with no income and must

depend on their own children as well, therefore they lacked potential resources to support their parents whereas the parents had more needs as most entered the phase of complete dependence on others. Due to the conditions of children's resources and parents' needs, the intergenerational relationship between the oldest-old parents and children (the young-old) was limited to only two types namely "Sociable" and "Tight-knit." The reason might be because most of the oldest-old were widowed and could not help themselves and so had to live with their children and grandchildren. So heavy burden might rest on the grandchild who had to take care of at least two older persons of two generations, those of parents and grandparents. In the future, the characteristics of the Thai family would increasingly be the Bean pole (many generations living in the same household and family would extend vertically more than horizontally). It is forecast that for the Thai population between 2010-2040, the number and share of the oldest-old per the older people aged 60 years old and over would increase from approximately 1 million or 13% of the total elderly population in 2010 to almost 4 million or 19% in 2040 according to the National Economic and Social Development Council (NESDC). At the same time, the Thais would live longer with increased numbers of dependency resulting in the need of long-term care. Therefore, intergenerational support in family should be considered in a wider perspective, not only between parents and children but also support between grandparents and grandchildren. As older people might relate to many generations of family members, preventions should be made to close the gap between generations.

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Cross-Cultural Comparison on Age-Friendly Cities: Akita, Japan and Columbus, Ohio

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Abstract
Reason: This research will help bridge the cultural gaps in aging studies. Japan is on the forefront of our aging world and we need to take this opportunity to learn from their experiences. This research will primarily focus on the differences in our approach to a similar problem and how that may be affected by differing cultures.
Problem: Lack of comparison material on the international approaches to Age-Friendly Cities.
Methodology: Compared Baseline Assessment Reports from each city for their interview questions and methods. Then compared how the results affected their priorities in each domain. Lastly, an interview with a cultural expert was conducted to clarify any cultural significance.
Results: Columbus's focus went primarily to actions that could be solved through city environment changes because that's where they found the greatest need. However, Akita had few concerns about housing and transportation in comparison. This drastic difference is affected by the cultural difference in priority of the group versus the individual.
Implications: This research can help interpret how action items in each city's Age-Friendly Initiative may or may not be culturally translatable.

Keywords: Age-Friendly City, International Aging, Aging in Japan, Cross-Cultural Comparison

Introduction

Age-Friendly City projects started being established all over the world after the W.H.O. adopted the program. When looking at an aging world, it is imperative that we learn from each other on a global level. With the great demographic shifts toward an older population beginning to unfold, we have an opportunity to peer into the solutions provided by other countries. Using Age-Friendly city projects can show us how culture affects the actions taken to help older adults. Accounting for culture also allows us to predict what actions may not be as translatable in a different country. With Japan being at the forefront of this great demographic shift, it is imperative that we learn from their experiences.

Methodology

Firstly, one must begin by choosing the two cities to compare. Columbus was the first and easy choice because of this author's work within their Age-Friendly Initiative for some months and they had a good foundation to build on. The major concern was choosing a comparative city in Japan. One major concern would be accessible and translatable data. When looking through Japan's Age-Friendly Cities on the W.H.O. website, an important point is a comparable population size. Columbus has a population of around 900,000 (8), whereas a lot of the populations of available Age-Friendly Cities in Japan ranged from 7,500 to 450,000 (6). With that in mind, a city was chosen from the higher end of options with Akita's population being around 311,000(6). Akita was named one of the "advanced" cities by the W.H.O. which led to many more case studies and articles to access. They also were one of the few cities in Japan with an AARP International affiliate. This means both cities were working under the same affiliate. It also provided access to more pre-translated materials.

Looking at the time frames of the research was also important to note. Especially, with all the changes that came with Covid, and how long, or how many cycles each city has been through. Columbus started their first cycle in 2016 (3) and Akita began in 2011(6) and had their second cycle in 2017(9). The Columbus 2016 cycle and Akita 2017 cycle, although not both their first, are a better match for comparison, in order to avoid too many discrepancies due to Covid. This being Akita's second round, also allowed the implication of their own Index to provide further insight into data that may be lacking.

What exactly are we comparing in these two cities? Originally, the goal was to review the Action plans of their Age-Friendly City Initiatives, however, their action plans are based on the needs of their community. This led to including and prioritizing the Baseline Assessment reports as the primary source of materials. The focus will be on the questions asked, why they were asked, and how this direction, as well as the direction of the results, may be affected by the culture of each community.

There are some factors to keep in mind that also affect the cities' differences outside of cultural factors. This includes the population, as previously mentioned, and the number of older adults in proportion to the population. Akita is 37.4% over the age of 65 (6), and Columbus is 11.7% over 65 (6). Akita was also named an "advanced" age-friendly city by WHO, which doesn't necessarily skew any results but should be kept in mind when forming conclusions. Finally, a major factor to be noted in the economic or financial factors that will not be addressed in this work. These are of course still affected by culture. How communities

choose to fund programs is still affected by the people, but will not be the focus of this research.

When finding and reviewing the material, The Columbus Age-Friendly Findings Report for 2016 was easily obtained. Now, Akita was a bit more difficult. It first started with the W.H.O. website to see what data and for what years were readily available. After searching for more thorough work, the Akita city website was found, which had a page on Age-Friendly City Initiative. This is where the "Akita City Age-Friendly City Citizen Awareness Survey Results" was pulled from. However, it still lacked the level of detail that Columbus provided, so the "Akita City Age-Friendly Index" results from 2014-2017 were added to suffice.

Finally, as a non-Japanese individual, a Japanese native reviewed my work to clarify any major cultural misunderstandings there may have been. An interview with Professor Teppei Kiyosue of The Ohio State University was conducted for his perspective.

Results

Domain Differences

The Domain Structure chosen by Akita and Columbus also differed greatly. Columbus decided to combine "Respect and Social Inclusion" with "Social Participation" and add "Safety and Emergency Preparedness". This extra Domain will not be addressed because there is a lack of material in Akita to compare with and it is outside of the scope of the typical Age-Friendly City Program. However, it does touch on the culture of Columbus. Concerns with staying as independent as possible, even in the event of an emergency, are a priority for them. Columbus provides many programs and resources to the community, but the goal is not to make older adults feel reliant on the community rather the community provides the space for them to be self-sufficient. Akita's domain structure in comparison, although they stuck with the main 8 domains in their Index results, their questionnaire had flexibility in the categories. An unmentioned category for Akita's questionnaire was their "Life" category. They followed up the questionnaire by asking "do you feel your life has purpose?". This question is very big and broad for Akita to attempt to take on. This displays how they see the city and one's environment as a major factor in any person's sense of well-being. Although they did inquire about their citizens' overall opinions on Akita's Age-Friendliness, putting the concerns of each individual's "sense of purpose " on their radar for improvement is a monumental task.

Columbus found strength in their older adults' access to transportation because over 75% of responses mentioned having no problems getting around (3). However, keep in mind that over 80% of these responses drive themselves (3). For those who do drive themselves, parking was also found to not be any major barrier (3). Traffic signs in the neighborhoods of Columbus older adults are easily readable to over 90% of respondents (3). Throughout their neighborhoods, 77% of older adults agree that the streets have been well maintained (3).

Of Akita's more open-ended responses on transportation, they found that the community's top strengths with public transportation were (greatest to least): convenience with the use of the "coin bus" system (34.5%), there are many stops (16%), the central city loop (100 yen ride) is convenient (15.3%), the non-step/low bus is convenient (11.1%) (8). Akita found that applications for the Coin Bus pass had increased each year since 2014 from 57.96% to

62.03% in 2017 (9). It is expected that the grant rate will continue to rise in the future due to the increase in the number of older adults becoming eligible for the service (9). In 2017, a large increase in universal design taxis led to an increase in the overall introduction rate of both universal taxis and the welfare taxis (9). Accessible taxis for older adults provide more freedom and independence in transportation.

Comparison Results

Housing

Akita in particular had home cultural factors that would not affect Columbus at all. This included, the step-up rooms, which is often used to take off shoes when entering a home. The need for sunlight, although felt not like not a major priority, is actually a culturally important thing to Akita. Professor Teppie Kiyosue led me to the insight that having a south facing window allows for maximum sunlight and is often considered when house hunting in Japan. Another Akita specific concern, would be “Japanese-style” toilets. These require you to squat to the floor and are often inconvenient for older adults.

Akita is a much more rural area and has a very different housing issue with there being too many old and abandoned homes compared to Columbus. Yet, their access to renovations through government grants is a great solution.

Outdoor Spaces and Buildings

For Akita, one of their few mentioned strengths in Outdoor Spaces and Buildings includes the barrier-free rate of public facilities. Although it is slightly below the Akita Prefecture average of 21.1% in 2017, it continues to rise steadily each year (9).

Despite Akita’s reports on their heated roads and snow removal projects (1), there seems to be a lack of measurements in this category of their Index. This displays that this area isn’t as great of a priority as other domains of Age-Friendly life. Please keep in mind, this category may overlap with the Housing category for Akita, and the understanding around what is “home” and what is “public” may vary. Akita chose to focus on their residents' “sense of security” outside, whereas Columbus wanted to know what physical barriers could be found. Surprisingly, Akita was very uneasy about going out. This is less of a shock when you consider the fears of older adults in particular. The lack of streetlights was a big concern for Akita, for example. Columbus inquired about specific barriers to going out and not as much about how they feel about those barriers being an issue. On the other hand, Akita looked at their fears first and worked toward the obstacles.

Transportation

Although both cities emphasized transportation, note the difference in car usage. In Columbus 82% of respondents mentioned cars as being their main method of transportation and income was the biggest factor into their choice of transportation. Those who did use public transport found to have more trouble getting around Columbus. Compared to about 60% of people who use cars as their main method of transportation in Akita, according to the “2nd Akita City Public Transportation Policy Vision” in 2016 (11). In Akita, regarding the use of buses, trains, and taxis when traveling within the city, most respondents answered that they “only use them a few times a year,” but those aged 75 to 84 use them more than once or

twice a month (9). More than 50% of the respondents answered that their older adults are highly dependent on public transportation as a means of going out (9). Akita did not review the other methods as in depth as Columbus. Columbus individuals use the bus system less but this may be due to lack of awareness of the services provided. Akita on the other hand did an in depth review of the needs of their bus system but touched very little on their walking paths and roads.

Communication and Information

Overall, one major difference in each city's findings is their primary source of information. Akita's main source was public papers (ex. Akita newsletter) and newspapers, as where Columbus' was through the internet (8)(3). Both cities did a good job of digging further into those specified needs. Despite the difference in the direction of their concerns, it was fitting for the city's expectations of information distribution.

Civic Participation and Employment

In general, Columbus was concerned with the "why" older adults were or were not working. Compared to Akita that emphasized their concerns with older adults' feeling of "purpose" in their work. This may also be due to the concerns around employment options in Akita. The established Silver Human Resources Center from previous years could be utilized to find out the "why" that Columbus is seeking. There is a chance that although an increased opportunity to stay employed is there, there may not be interest. This doesn't seem to be the case based on Akita's evidence in finding "purpose" through work, yet, the questions could still be asked. Another interesting difference is in Akita's Action Plan, they label those aged 15-65 as the 'working age'. This is concerning because if people wait til later to work, or are retiring later, it affects the outlook. The main reason for addressing this, is that there is room for concern that older adults are estimated to be supported by about 1.1 of those in the 'working age' population by 2040 (10). Associating age with 'workability' is not something we see in Columbus. Of course, they have less to worry about considering the percentage older adults take in the population. This is also due to Japan's mandatory retirement seen in some jobs.

Respect and Social Inclusion

Overall, Columbus focused on the 'respect' aspect of this domain more than Akita, and Akita focused on the 'inclusion' more. Columbus asked older adults about their feelings of being perceived as an older adult in the community, and Akita asked about their general opinion around 'aging'. Neither had a positive outlook, but, it shows that despite the cultural difference, aging affects both the feeling of respect and social inclusion. Akita wants to make sure their community is not living in fear of getting older or an aging society in general. Columbus wants their older adults to feel like a part of the community.

Health Services and Community Supports

Columbus's main focus with Health Services and Community Support was their older adults' accessibility to services. Whether that be their understanding of services available, what pays for these services, whether or not they are eligible or if they can afford it, were all important questions to Columbus. Akita took a different approach. Although their more open-ended question led to similar results of financial concerns as a major barrier in health care, the Akita Index indicated they had a focus on dementia in their city. They made sure to define a

"healthy" life expectancy and measure how many older adults are living in their dependent years. Akita could take from Columbus in the way that their members expressed financial concerns, so they should focus on those solutions. Columbus on the other hand could open up a new viewpoint on what Health Services and Community Supports mean, with a focus on dementia.

Social Participation

Once again we see Akita involving other generations in the results of some of their surveys, which differs from Columbus. For example, when looking at conditions needed for social participation by age group in Akita, the younger generation emphasized "cost," the 'working generation' emphasized "time," and the older generation emphasized, "familiarity" (9). Akita overall was more in-depth with this domain compared to others, showing that this may be a priority of theirs. They even adjusted for regions to see how activity participation may vary based on location and/or access. On the other hand, Columbus combined this category with the Respect and Social Inclusion domain which limited the number of details we saw in Akita. Akita details types of activities such as sports and their 'organized social gatherings' by residents. However, this makes sense considering those who mentioned rarely or never participating in any social community events were 60% in Akita and 42% in Columbus.

This domain is unique in the sense that despite Akita's more 'group-oriented' driven culture, they found significantly more concerns with social participation. This is where an individualized approach may be a better fit. They have continued to ask the right questions but, if they adjusted for age or income in more of their results, they may find the missing details to pursue a change.

Conclusion

Culture affected just about every part of implementing the Age-Friendly City Initiative. It also affected the baseline of barriers around aging that need to be overcome. For example, Japanese-style toilets are unique to Japan's culture and in turn, created a unique barrier. The level of involvement of both the older adults and other generations in the baseline assessment was also affected. Akita's broader scope of an 'aging society' rather than Columbus' 'aging individuals' created more space for younger citizens to have a say in the needs of the community as they age. Columbus saw prioritizing the older adults' opinions on the city as a way to 'give them a voice' and hear directly from the demographic in need. Neither of these approaches is exactly 'better' they just reflect how each culture made its way into the process.

Although some of the action items may not be culturally translatable, there are still some methods each city could take from the other's perspective. With this in mind, the next steps would be to review the action items and assess how they may be perceived in the differing cultures before attempting to adopt new tactics.

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Determinations of Self-Reported Health of Elderly People in Nepal

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Abstract
The health of the elderly has become a growing concern as the aging population increases. Self-reported health is a widely used measure of health status through individuals. This study has utilized data from Nepal Ageing Survey 2015 which is the biggest survey on aging in Nepal till now. This study includes seven major composite variables: demographic, socio-cultural, economic, support and care, modernization, living arrangement, and health-related variables. There are altogether 40 independent variables under these composite variables. Regarding the self-reported health of elderly people by differentiating along with the most significant variables the binary logistic regression analysis is used where only the 11 most significant variables are selected for the purpose of the best-fitting model. They are; age, sex, literacy status, acceptance of advice of household members, religion, working wage job, the sufficiency of property, nutrition, caring condition, enthusiasm, and medical treatment receiving status. This research has identified the major eleven factors which have a significant positive impact on elderly health based on large-scale national data for the first time in the history of Nepal. Male elderly are more likely to be in good health condition than females. Low educational attainment increases the chances of reporting poor health. Age structure, Advice accepted in the family, religion, working wage jobs, sufficient food, and property, receiving medical treatment facilities, and proper care as per the elderly interest, and enthusiasm are the major predictor variables to support the good health of elderly people.

Keywords: Nepal Ageing Survey 2015, Elderly People, Self-Reported Health

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Introduction

The purpose of this study is to investigate the major determining factors of the self-reported health (SRH) of elderly people in Nepal according to major selected variables sorted from literature reviews based on Nepal Ageing Survey 2015. Health status is a multidimensional concept, requiring multiple indicators and multiple methodologies for adequate measurement. Different indicators of health status are usually included in health surveys, including single summarizing measures, questions relating to disease incidence and prevalence, and questions relating to functioning (physical, cognitive, emotional, and social) or disability (Stewart & Ware, 1992). SRH reflects an individual's perception of their social, biological and psychological health, and it has been linked to increased mortality risk and increased use of health services. SRH is an easy measure of overall health and is useful in identifying persons at risk of a decline in health and the risk of disability in older adults. Population ageing is one of the most significant trends of the 21st century. It has important and far-reaching implications in all aspects of society. Around the world, two persons celebrate their sixtieth birthday every second accounting for an annual total of almost 58 million sixtieth birthdays. With one in nine persons in the world aged 60 years or over, projected to increase to one in five by 2050, population ageing is a phenomenon that can no longer be ignored (UNFPA & HAI, 2012). The total elderly population of Nepal aged 60 years and above consisted of 10.2 percent (around 3 million) of the total population in 2021, whereas, it consisted of 9.1 percent (2.1 million) in 2011, 6.5 percent (1.5 million) in 2001 and 4.6 percent (1.07 million) of the total population in 1991. It shows that the number of the elderly population is increasing at more than double the rate of the total population growth (CBS, 2014, 2023). Nepal projected to entry in ageing society by 2028 but it had already entered in 2021(CBS, 2023). In addition to the increasing old age population, Nepal is in its demographic transition phase, facing various forms of social changes due to the advent of modernization, the influence of Western culture, the increasing involvement of women in side jobs, and the growth of individualism. The joint family system has been transforming to the nuclear family. The traditional values of taking care and supporting the elderly parents in their old age by the grownup children, particularly sons, are gradually changing (Chalise, 2012). The ageing of populations also suggests additional care, which is becoming a burden to families and society. The information on different places of residence, socio-cultural, economic, demographic, and health status of the elderly people are valuable in understanding their salient features.

Until recently, very little attention has been paid to the dynamics of ageing in human beings. However, the continued increase in the percentage of aged people in the population is creating humanitarian, social, economic, and demographic problems in many countries. As health is an important indicator of overall wellbeing of elderly and collecting data on health status of elderly is difficult and expensive as well. Under these circumstances, SRH may be an alternative research method to assess the health of the elderly because it is simple, short, and global (Chalise, 2007a).

Since the 1950s, SRH has been one of the maximums often used variables in gerontological and fitness studies in Western and different advanced countries. The size of SRH is usually ascertained by a single question “In general, could you assert your fitness is …?” this is rated on a five-factor Likert scale from extraordinary to poor. Past studies have proven that self-rated fitness is a useful proxy for morbidity and mortality patterns in epidemiological studies. Researchers have said that SRH has impartial results on mortality, new morbidity, practical ability, fitness care utilization, hospitalization, and recovery from illness.

Self-score has additionally, been proven to be a higher estimate of the fitness fame of the aged than expert scores finished by nurses. Self-score amongst older adults is located to be usually extra favourable than physicians' scores. This study uses self-reported health (SRH) of older persons as a proxy measure of health. SRH is widely used tool in developed countries as well (Chalise, 2007a).

The problems are also arising in developing countries like Nepal. There are several studies completed on the socio-cultural, demographic, and health situation of the ageing population in Nepal, but they are based on very small areas and data. Most of these ageing studies are based at the local district level, and they have very few respondents. Identifying the major issues of ageing at the national level with the advanced statistical applications is still lacking. The study will cover this research gap to identify determinants of the self-reported health status of older adults in Nepal.

Methods

The descriptive research design was the most common method used for this study. The data set for this study is obtained from the nationally representative Nepal Ageing Survey 2015, which is used to satisfy the research questions and objectives. A socio-economic survey of 7,200 households that included 8,626 different elderly persons aged 60 and above was conducted through structured questionnaires. The survey was conducted by the Center for Social Science Studies, Nepal under the sponsorship of the Ministry of Health and Population, Government of Nepal. The main objective of this survey was to provide in-depth and systematic information on the ageing issues of Nepal and to fulfill the data gap of the aged population. It was a national survey and data was ready to use in 2015. The qualitative data got checklist approval from MoHP. This dissertation utilized simple statistical analysis to advanced statistical tools like cross-tabulation and logistic regression analysis**.** Binary logistic regression is used to predict the odds of being a case based on the values of the independent variables (predictors). Binomial logistic regression first calculates the odds of the event happening for different levels of each independent variable and then takes its logarithm to create a continuous criterion as a transformed version of the dependent variable. The categorical variable *y*, in general, can assume different values. In the simplest case scenario, *y* is binary meaning that it can assume either the value 0 for bad or 1 for good. In this study, we call the model **"**Binomial Logistic Regression**",** since the variable to predict is binary. In our analysis, we use binomial logistic regression since we have a dichotomous dependent variable.

Logistic regression is used to calculate the probability of a binary event occurring, also known as "yes" or "no" outcomes i.e., Good or Bad health status in the case of this study. In simple linear regression, the outcome variable Y is predicted from the equation:

$$Y_i = b_0 + b_1X_{1i} + \varepsilon_i$$
$$Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + b_3X_{3i} + \ldots\ldots\ldots + b_nX_{ni} + \varepsilon_{i;}$$

Where, b_n is the regression coefficient of the corresponding variable X_n.

These linear models cannot be applied when the outcome variable is categorical. For the categorical outcome variables, logarithmic transformation is used (Berry &Feldman 1985). This transformation is a way of expressing a non-linear relationship in a linear way. As logistic regression is based on this principle, it expresses the multiple linear regression

equation in logarithmic terms (called the logit) and thus overcomes the problem of violating the assumption of linearity.

So, in logistic regression, instead of predicting the value of a variable Y from a predictor variable X_1 or several predictors variable X_s, we predict the probability of Y occurring given known values of X_1 (or X_s). When there are several predictor variables, as in our case, the equation becomes:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i} + b_2 X_{2i} + \ldots\ldots\ldots + b_n X_{ni})}}$$

Where, b_0 is a constant, X_1 is predictor variable (Similar with X_2, ……. X_n), b_1 is the weight attached to that predictor variable X_1 (Similar with b_2…….b_n).

This contains the multiple regression equation and expresses the equation in terms of the probability of occurrence of Y (i.e., the probability that a case belongs in a certain category). The result of the equation varies between 0 and 1. A value close to 0 means that Y is very unlikely to have occurred and a value close to 1 means that Y is very likely to have occurred. This can also be presented in several ways. It is useful when calculating probability based on given values. Also, there is another representation of the equation in pure logit multiple regression equation form;

$$\text{logit} = \log(p/1\text{-}p) = b_0 + b_1 X_{1i} + b_2 X_{2i} + \ldots\ldots\ldots + b_n X_n$$

Different representations and forms of this equation are used for this study.

The regression analysis was done using SPSS software.

This analysis comprises various significance tests, variance tests, the computing classification accuracy of the null model, the computing classification accuracy of the model with predictor variables, and the statistical significance of individual dependent variables. These tools individually contribute to finding the most significant predictor variables from a vast range of composite variables. Also, these are used to calculate the probability of a case being in the target category of the dichotomous dependent variable. These probabilities are calculated based on a pure logit regression equation for fitting the final model.

Research Framework

The framework of this study is based on theoretical as well as empirical literature reviews about elderly people. The health status of elderly people living in Nepal is considered a dependent variable for this study, which is determined by various factors. The conceptual framework of this study explains the interconnection between the health status of elderly people and their independent variables: demographic, socio-cultural, economic, spatial as well as support and care, globalization process and living arrangements. The research conducted in the past on the issues of the health status of the elderly was found lacking on using a framework based on large scale data and variables that establishes uniformity in the national and global context. It is hoped that this research helps overcome this gap. This framework specifies the following composite lists:

Demographic variables: Age, sex, marital status, and ecological region.

Socio-cultural variables: Literacy status, completed education level, religion, marriage, and other ceremonies participation status, public discussion participation status, decision-maker to expend money, the status of rising senior citizen issues, evaluation of life, voting status, acceptance of advice by household members, knowledge of security allowance and widowhood.

Economic variables: Possession of assets, annual family income, working wage job status, possession of cash status, the sufficiency of property, possession of land, and retired employee status.

Living arrangement variables: Need of other's assistant, living with whom, and better living with whom in old age.

Modernization variables: Telephone on your interest and rural-urban settlement.

Support and care variables: old age allowance status, separate room for sleeping, caring condition, feeling of freedom, enthusiasm, and medical treatment receiving status.

Health-related variables: Nutrition status, physical exercise status, tobacco using status, alcohol consumption status, and vegetarian status.

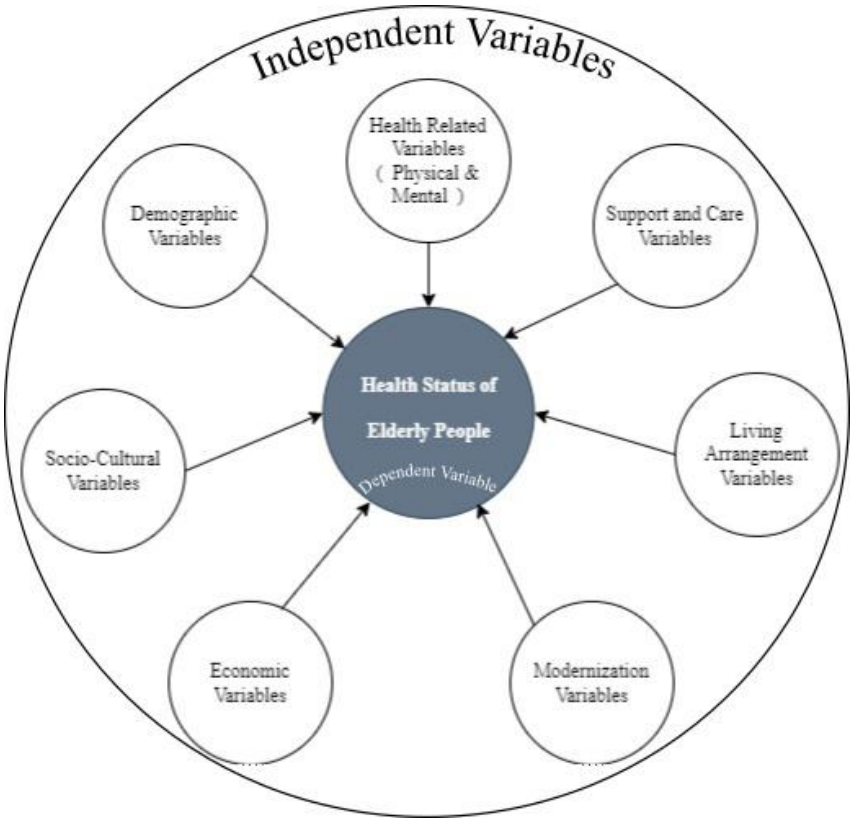

Figure 1: Conceptual Framework of the study

Results and Discussion

This study has analysed factors that influence the elderly's self-reporting of good health compared to reporting bad health. There are altogether 40 independent variables under the study. This study found 38 significant variables in the first step of the study regarding the health status of elderly people by differentiating along with most significant variables. The binary logistic regression analysis is used where only the 11 most significant variables are selected to fit the model. The results show that with increasing age people are less likely to be good health status. A study in Thailand found old age to be positively associated with poor health (Haseen F, Adhikari R, et al.,2010) due to decline in mobility and activities. The biological theories which have already been discussed also support the argument. This study finds that females are less likely to have good health status than males. Similarly, previous studies demonstrated that women were more likely to report poor self-reported health status and to have a higher prevalence and incidence of disability compared with men at older ages (Alexander Tda S, et al.,2012). Moreover, men have better self-reported health than women are in line with other studies (Leinonen R, et al.2020; Dong W, et al.,2017).

This study shows that the illiterate elderly is somewhat in good health status than literate elderly. A similar type of results was found in other studies where, low educational attainment increased the chances of reporting poor health (Krokstad et al., 2002; Mackenbach et al., 2008). A possible reason could be through lack of employment, low economic conditions, and consequential inability to take care of health care needs. In our study, most of the elderly have been found with low educational attainment, so it may help to increase the chance of reporting poor health.

This study finds that elderly people whose advice is accepted in the family have better health status than those not accepted. Similar results have been found in Ghana, where elderly people's satisfaction often relates to having children living with family members and being involved with community affairs (Apt,1993). The presence of family could have a positive effect in terms of the well-being of older person and can also provide good preventive measures against the lengthy institutional (Bowling et al.,1993). Religion is viewed by many as an assisting mechanism in organizing thoughts and actions. Maslow indicated that the religious lifestyle and peak experiences are to be valued as producing health through the impetus they give for altering possible harmful lifestyles (Bregman,1976). The study compares the Hindu religion with Buddhism, Islam, Kirati, and other religions. Only the Kirati religion are more likely to be in good health status than Hindu where the difference is positive and significant. According to Gallup (2011), 87 percent of the global population is affiliated with a religion. Results show that spiritual and religious involvement is associated with physical and mental health (Chirico, 2016; Monika, 2003). This study finds that those having working wage jobs were 3.175 more likely to be in good health status in comparison to those who did not have working wage jobs. Work and professional duties might help older adults maintain their self-esteem, connectedness and sense of belonging, which may profoundly affect their health (Palladino et al.,2016). This study reveals that a group of people having sufficient property is 2.592 times more likely to have a good health status than those very few sufficiencies. A similar study was found in Iran, where respondents in the highest income quintiles were less likely to report poor health compared to those in the middle and low income quintiles. The most elderly Iranians who were poor and lived under poor conditions with little or no earnings, perceived their health to be poor (Tajvar & Montazeri, 2008). This study exposes that those having sufficient of nutrition food were 1.640 more likely to be in good health status in comparison to those who did not have

sufficient nutrition food. Similar study found in US where there is a potential for reverse causality between food insecurity and self-reported health among elderly persons because poorer health status may contribute to food insecurity through high medical bills and higher costs for medications (Lee & Frongillo, 2001).

This study discloses that the elderly who get care in their interest are 1.53 times more likely to be in good health status in comparison to those who do not get care in their interest, having allowed for other explanatory/predictor variables. The influence or presence of family could have a positive effect in terms of the well-being of the older person and can also provide a good preventive measure against lengthy institutionalization (Bowling et al., 1993).

This study exposes that those who are receiving medical treatment are 1.628 times more likely to be in good health status in comparison to those who are not receiving any medical treatment, having allowed for other explanatory/predictor variables. Similar study found that it is essential to promote health throughout the entire lifespan of individuals to ensure their well-being in old age (Gonzalez et al., 2020).

This study suggests that the elderly who have enthusiasm or eagerness are more likely to be in good health status in comparison to those who have lesser enthusiasm, having allowed for other explanatory/predictor variables. This type of similar study has found that in subjective well-being, satisfaction with certain aspects of life was used to assess individual health state. The results showed that persons with high feelings of satisfaction were less likely to report poor health. Supportive findings in Brazil revealed a similar association (Borim, 2014., Sposito et.al., 2010).

Based on final most significant 11 predictors variables, for final prediction model, the likelihood of being in good health status for a random cases of elderlies, are calculated. We take 4 random cases where we assume 4 elderlies with their own distinct characteristics. 2 of them are elderly males and 2 elderly females. 1 male and 1 female elderly are assumed to have characteristics as the privilege or ideal life that elderly wish for in their old age, with sufficiency in care, medicine, acceptance of advice, the sufficiency of nutrition, property, high enthusiasm, and so on. Another 1 male and 1 female elderly were assumed to have the complete opposite of the earlier ones, with the least ideal conditional characteristics of elderly for the observation of difference in the likelihood of being in good health status in different cases of elderly. The model predicts a 93.09 percent and 94.12 percent likelihood of being in good health status for female and male elderly, respectively, who have ideal elderly life conditions. Similarly, for the other two least privileged, only 28.55 percent and 32.21 percent likelihood of being in good health status were predicted for female and male elderly, respectively. In addition, female elderly was found to be in a less good health status than male elderly, either in ideal or least ideal elderly living conditions.

As far as the discussion on policy responses goes, as age increases, health status decreases, so effective separate elderly age group policies are needed to address the elderly people of Nepal. Male elderly is to be more likely to be in good health condition than female where most of the proportion has occupied by widows compared to widowers so policy should be strengthening to reducing loneliness of female. Older age female care taking facilities should be strengthened. Low educational attainment also has the chances of reporting poor health so it is recommended that upcoming elderly need to improve educational status for healthy living in future. Highly appreciating and follow-up elderly advice help to increase the health status of the elderly so it should be utilized in societies of Nepal. There should be working

wage job policies toward ageing people according to their capacity. Elderly people have to be ensured with their own legally sufficient property policy so that they can feel healthy. A sufficient food security assurance policy is needed to make healthy ageing. Proper care policy toward elderly people is needed to be healthy as per their interest. Medical treatment facilities policies should be reorganized to make healthy elderly. The policy should be emphasized making the elderly more enthusiastic to increase the size of healthy ageing.

Conclusions

The result shows that an increase in age tends to less likely to be good health status. Age is seen as a significant positive predictor of self-reported health. This study finds that females are less likely to have good health status than males. Low educational attainment increases the chances of reporting poor health. In this study, most of the elderly have been found to have low educational attainment, so it may help to increase the chance of reporting poor health. This study finds that elderly people whose advice is accepted in the family have better health status than those whose advice is not valued. The presence of family could have a positive effect in terms of well-being of older person and can also provide good preventive measures. Religion would have a positive effect on functional health and the effect would increase with age. The relationship between religion and health is important because the elderly population is rapidly increasing and religion is an important factor in the lives of many elderly individuals. But it differs according to their religion's norms and values. This study finds that those elderly who have working-wage jobs are more likely to be in good health status in comparison to those who do not have working -wage jobs. This study exposes that elderly people having sufficient property are more likely to have a good health. The best is to achieve self-actualization, having met all the “lower” level needs successfully. The elderly who have enthusiasm are more likely to be in good health status in comparison to those who have lesser enthusiasm. The results show that people with high feelings of satisfaction are less likely to report poor health.

This research has identified the major eleven factors which have significant positive impact on elderly health based on large-scale national data for the first time in history. These findings have implications for government policy, strategies, and preparation on improving the self-reported health of elderly people and promoting their individual wellbeing. This suggested that self-reported health of elderly people and personal well-being may be modeled within the framework of time and space, according to earlier studies. This will allow for an evaluation and generalization of the data base on earlier scientific studies. This may also be a contribution to the UN target of SDG 2020–2030.

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