

Title	Attitude Survey on Nursing-care Service: Comparison among Active Seniors, Informal Carers and Formal Carers
Author(s)	Miwa, H., Watanabe, K., Määttä, H., Niemelä, M.
Citation	Paper presented at 4th International Conference on Serviceology, IC Serv 2016, 6-8 September 2016, Tokyo, Japan
Date	2.7.2018
Rights	This article may be downloaded for personal use only.

VTT  
<http://www.vtt.fi>  
P.O. box 1000  
FI-02044 VTT  
Finland

By using VTT Digital Open Access Repository you are bound by the following Terms & Conditions.

I have read and I understand the following statement:

This document is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of this document is not permitted, except duplication for research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered for sale.

# Attitude Survey on Nursing-care Service - Comparison among Active Seniors, Informal Carers and Formal Carers -

Hiroyasu Miwa<sup>1\*</sup>, Kentaro Watanabe<sup>1</sup>, Hannamaija Määttä<sup>2</sup> and Marketta Niemelä<sup>2</sup>

<sup>1</sup> National Institute of Advanced Industrial Science and Technology (AIST)

<sup>2</sup> VTT Technical Research Centre of Finland

\* Corresponding Author: Tel: +81 3 3599 8201, E-mail: h.miwa@aist.go.jp

## Abstract

The population aging rate is increasing annually in Japan. To sustain the elderly nursing-care services, it is necessary to improve the service system in many aspects such as system, finance and actual services. In this situation, we considered that we should understand the expectations for and problems with the future nursing-care services to propose better nursing-care services and systems. Therefore, the authors conducted an internet inquiry survey among active seniors, informal carers, and formal carers about nursing-care services and compared their attitudes. As a result, we found expectation for support devices and differences caused by care experience.

## Keywords

Elderly-care, Inquiry survey, Technology use

## 1 INTRODUCTION

The population aging rate, which is the percentage of the population over 65 years old, is increasing annually worldwide. The Japanese rate, which is the highest among OECD countries, reached 25.1% in 2013 (OECD 2015) and is expected to increase to 38.8% in 2050 (National Institute of Population and Social Security Research 2012). One of the important issues in aging societies is elderly nursing-care. In Japan, we executed the long-term care insurance act in 2000. The long-term care insurance pays 80% or 90% of service charge for nursing-care services according to personal annual income. Elderly individuals use the nursing-care services according to their care plans designed by care managers to meet their physical and mental conditions and needs. As reported by the Ministry of Health, Labour and Welfare (MHLW), 4.4% of the population between 65 and 74 years of age and 31.8% of the population over 75 years old use nursing-care services covered by public care insurance (MHLW 2015a). In addition, many elderly people are supported by their families instead of nursing-care services. Therefore, the potential needs for nursing-care services are bigger than currently available. On the other hand, the payment of long-term care insurance has reached \$80 billion and is expected to increase to \$188 billion in 2025 (MHLW 2015b, MHLW 2016). Moreover, an anticipated shortage of a million caregivers in 2025 has been reported (MHLW 2014). To sustain the elderly nursing-care services, it is necessary to improve the service system from many aspects such as system, finance and actual services. As part of the improvement, development and installation of new technologies such as robotic devices for nursing-care

(Robotic Care 2013) and IT-based systems have been launched.

In this context, a Japanese and Finnish collaborative project called “Meaningful Technology for Seniors: Safety, Comfort and Joy -Models of Digital and Human Networks (METESE)” was launched in 2015 (METESE 2016). This project aims at integrative development, application, and evaluation of meaningful technologies for elderly care. We then considered that we should understand the expectations for and problems with the future nursing-care services to propose better nursing-care services and systems. Therefore, the authors conducted an attitude survey about nursing-care services among elderly people, who were service receivers, and care workers, who were service providers; we aimed to compare the attitudes regarding nursing-care services among them.

## 2 INQUIRY SURVEY ABOUT NURSING-CARE SERVICE

The authors conducted an inquiry survey to find attitude gaps between service receivers and providers in terms of expectation, needs and problems.

At first, the authors inferred that experience of nursing-care would affect attitude toward nursing-care. For the persons with care experiences, there are two cases in Japanese elderly nursing-care. In the first case, care staff, such as caregivers and nurses, support the elderly individuals' daily lives through the public nursing-care services. In the other, the families of elderly people such as spouses and children support the elderly individuals' daily lives in their homes. Although both care staff and their families are service providers from the viewpoint of the elderly people, we call

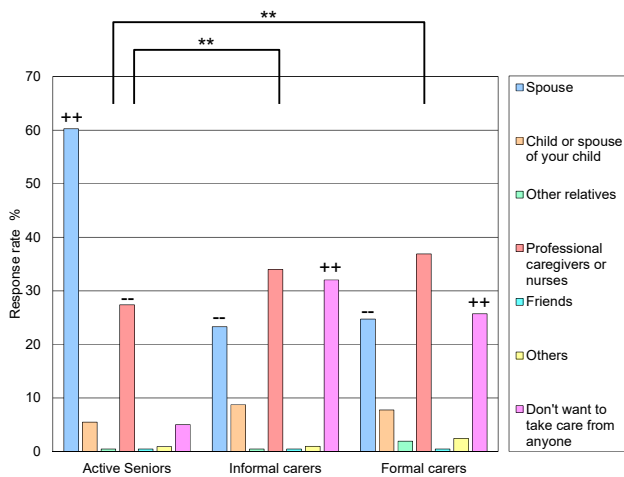


Figure 1: Survey results of Q1.

(\*\*):  $p < 0.05$ , ++: more than expected ( $p < 0.05$ ),  
 --: less than expected ( $p < 0.05$ )

the former “formal carers” and the latter “informal carers.” Hence, we selected active seniors, who received neither formal nor informal care, as future service receivers without nursing-care experience; informal carers as future service receivers with nursing-care experience; and formal carers as deeply experienced service providers. Then, inquiry survey about attitudes toward nursing-care services and technology use related to the services was conducted on the internet.

The survey consisted 20 questions designed by the authors based on preliminary interviews with elderly people and care workers. The participants selected answers from a list. In this study, we analyzed the eight common inquiries shown below.

Q1. When you need elderly-care, who do you most want to care for you?

Q2. When you need elderly-care, which service do you most want to use?

Q3. Please select information devices you often use.

Q4. Please select support devices you may use in order to live in your house independently.

Q5. Please select support devices you can allow caregivers to use for you.

Q6. Do you feel reluctance in allowing manufactures or service providers to utilize anonymized information about your usage and the frequency of your use of support devices for improvement of products and services?

Q7. How necessary do you think scientific technologies such as the internet and robotics could be in your life in the future?

Q8. Do you think that it is good for society that scientific technologies such as the internet and robotics will be more widespread?

In response of Q3, Q4 and Q5, multiple responses were allowed.

### 3 SURVEY RESULTS

As the overall results of inquiry survey, 219 active seniors, 206 informal carers and 206 formal carers responded. We

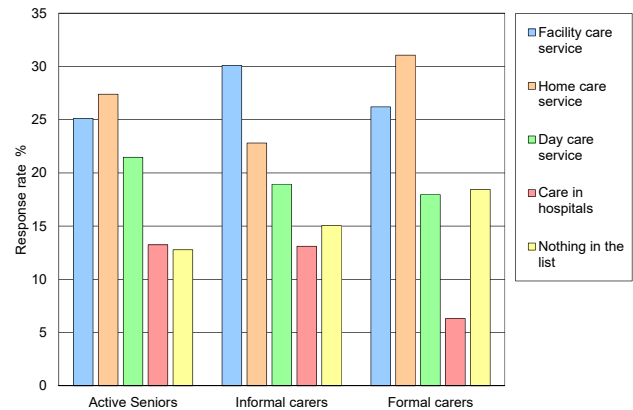


Figure 2: Survey results of Q2.

applied Pearson's chi-square test and multiple comparison with adjusted significance level using the Benjamini and Hochberg method (Benjamini, Y. and Hochberg Y. 1995) to compare the differences in population rates among three groups. Additionally, we applied residual analysis to Q1, Q2, Q3, Q6, Q7, and Q8 and one-way ANOVA to Q2, Q4, and Q5 to compare the significant difference among the options.

#### 3.1 Expectation for future nursing-care (Q1 and Q2)

First, we asked the participants about service providers (Q1) and service types (Q2) as the future expected life style. As a result of Pearson's chi-square test, we confirmed significant differences among the active seniors, informal carers and formal carers ( $p = 1.48 * 10^{-16}$ ) in Q1. Additionally, we found significant differences between active seniors and informal carers ( $p = 1.01 * 10^{-14}$ ) and between active seniors and formal carers ( $p = 1.57 * 10^{-12}$ ). These results showed that attitude differences were caused by care experience. Figure 1 shows the results of Q1. In particular, more than 60% of the active seniors responded that they wanted to receive care from their spouses. This rate was significantly higher than that for informal and formal carers who had care experience. On the other hand, the informal and formal carers responded, “Don't want to take care from anyone,” significantly more than the active seniors.

However, there were no significant differences among the active seniors, informal carers, and formal carers in Q2 ( $p = 0.13$ ). They responded that they wanted to use facility, home, and day care services significantly more than care in hospitals by one-way ANOVA ( $p < 0.05$ ). Figure 2 shows the results of Q2.

#### 3.2 Current use of IT devices (Q3)

Before asking about technology use such as robot and IT we asked participants about their current use of IT devices (Q3). As a result of Pearson's chi-square test for each device, we confirmed significant differences among the three groups in use of PCs, smart phones, feature phones and fixed line phones. Then, as a result of the residual analysis, we found that the active seniors used PCs, feature

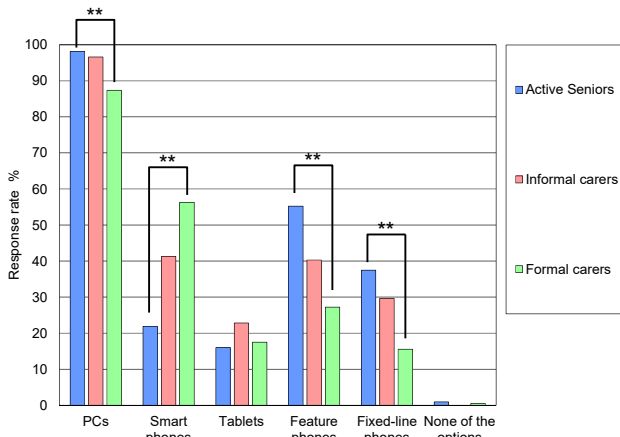


Figure 3 Survey results of Q3.  
(\*\* :  $p < 0.05$ )

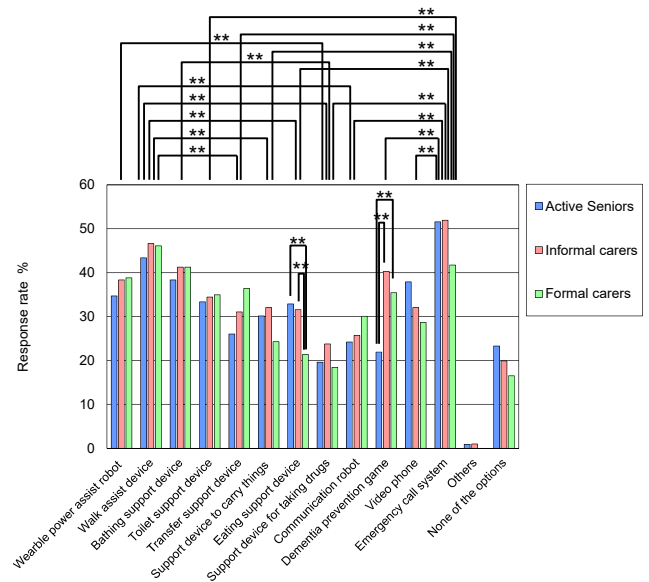


Figure 5 Survey results of Q5.  
(\*\* :  $p < 0.05$ )

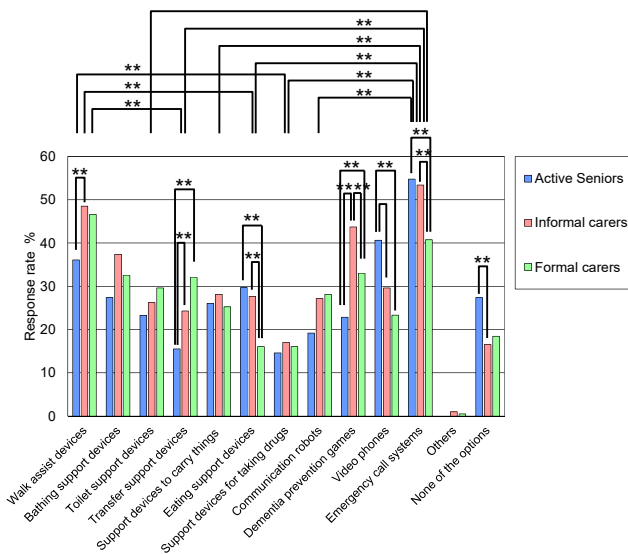


Figure 4 Survey results of Q4.  
(\*\* :  $p < 0.05$ )

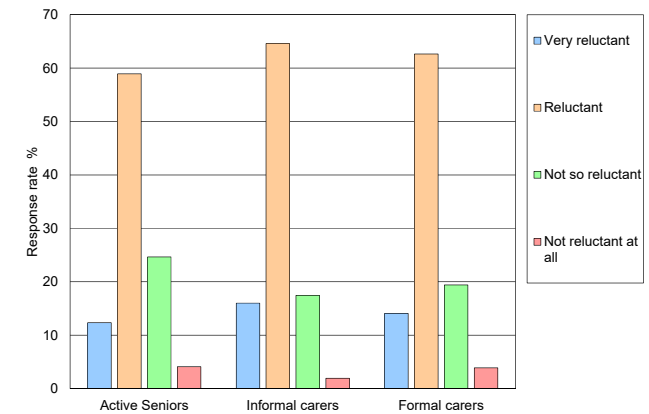


Figure 6 Survey results of Q6.

phones, and fixed line phones significantly more than expected, and the formal carers used smart phone significantly more than expected. Figure 3 shows the results of Q3.

### 3.3 Technology use in nursing-care (Q4, Q5 and Q6)

We asked about technologies such as robotic devices and information devices that might participants might be use (Q4) and that might be used by caregivers in their nursing-care services (Q5).

As a result, we found significant differences among three groups in walk assist devices, transfer assist devices, eating support devices, dementia prevention games, video phones, emergency call systems, and none of the options ( $p < 0.05$ ) for Q4. Then, we applied multiple comparisons to these devices and obtained the results shown in Figure 4. In particular, the response rate of “None of the options” showed the participants’ attitude toward uses of support devices. We confirmed a significant difference between active seniors and informal carers ( $p = 0.021$ ) and a marginally significant difference between active seniors

and formal carers ( $p = 0.057$ ). The active seniors were less interested in use of support devices than informal and formal carers.

Next, we analyzed the differences in needs among the support devices using a one-way ANOVA. As a result, walk support devices were expected at a significantly higher rate than were transfer support devices and support devices for taking drugs, and emergency call systems were also expected at a significantly higher than were toilet support devices, transfer support devices, support devices to carry things, eating support devices, support devices for taking drugs, and communication robots. These results showed that people highly expected needing walk support devices and emergency call systems in their future lives.

On the other hand, we found significant differences among groups in eating support devices and dementia prevention games in Q5 ( $p < 0.05$ ). We applied multiple comparisons to these devices and obtained the results shown in Figure 5. The eating support devices were more required by the active seniors than the informal and formal carers. The dementia prevention games were more required by the informal and formal carers than the active seniors. We

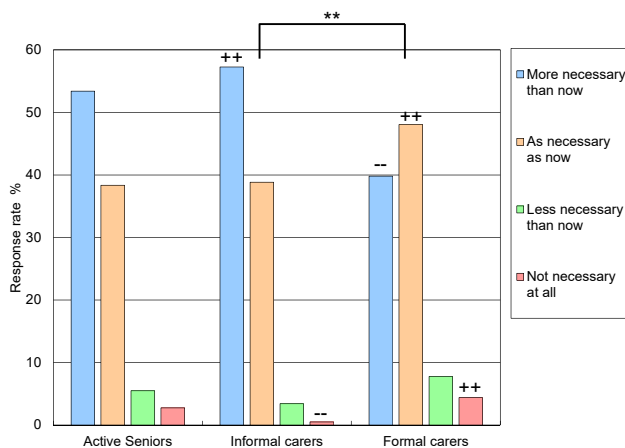


Figure 7 Survey results of Q7.

(\*\*):  $p < 0.05$ , ++: more than expected ( $p < 0.05$ ), --: less than expected ( $p < 0.05$ )

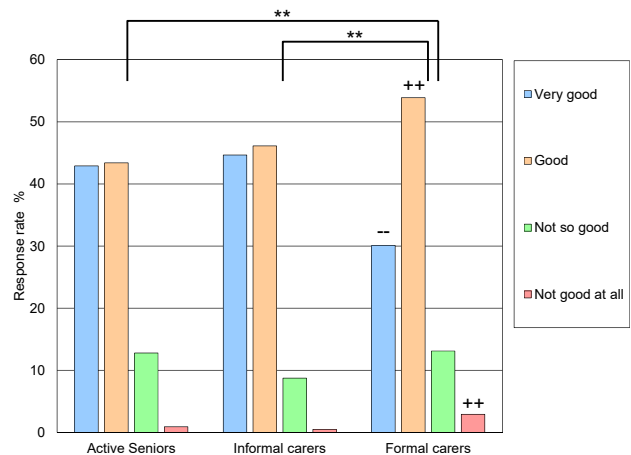


Figure 8 Survey results of Q8.

(\*\*):  $p < 0.05$ , ++: more than expected ( $p < 0.05$ ), --: less than expected ( $p < 0.05$ )

analyzed the differences in needs among the support devices and found the same trend as in Q4. The walk support devices and emergency call systems were expected significantly more than other devices.

Moreover, we asked acceptance of information use obtained from support devices for products or service development (Q6). As a result, 76.1% of participants responded very reluctant or reluctant as shown in Figure 6. Additionally, there were no significant differences among the groups.

### 3.4 Future Life and Society (Q7 and Q8)

Finally, we asked the necessity and expectation of technologies in our life (Q7) and our society (Q8). As shown in Figure 7, 91.9% of participants responded “More necessary than now” or “As necessary as now” in Q7. They highly expected to the assistive technologies. However, there were significant differences among the group by the Pearson's chi-square test ( $p = 3.18 \times 10^{-3}$ ). Multiple comparisons showed significant difference between informal carers and formal carers. In addition, the residual analysis showed that the respondents of “More necessary than now” and “As necessary as now” were more than expected value and those of “Less necessary than now” were less than expected value. Accordingly, the active seniors and informal carers seemed to feel necessity more than the formal carers

Moreover, the result Q8 was similar to Q7. Assistive technologies were acceptable to our society because 87.0% of total participants responded “Very good” or “Good.” The results of comparison among groups were also similar to Q7. Significant difference among group by the Pearson's chi-square test ( $p = 0.012$ ) and significant differences between active senior and formal carers and between informal carers and formal carers by multiple comparison ( $p = 0.048$ ,  $p = 0.018$  respectively) were confirmed as shown in Figure 8. The residual analysis showed similar results to Q7. The active seniors and informal carers were more positive to the technology use in our society than the formal carers.

## 4 DISCUSSIONS

In this section, we compared the characteristics among the active seniors, informal carers, and formal carers according to survey results. First, with respect to the expectation to future nursing-care, there were significant differences in service providers among the groups. However, there were no significant differences in service type among the groups. The active seniors who have not experienced nursing-care wanted nursing-care by spouse, and the informal and formal carers who have experienced nursing-care do not want to take care from anyone. Therefore, we considered that informal and formal carers had negative attitude towards family's burden by nursing-care because they understood the hardness of nursing-care. We also considered that attitude to future nursing-care could be affected by experience of nursing-care.

Next, we considered technology use in nursing-care services. The active seniors used PC, feature phones and fixed line phones more. The formal carers used smart phones more. In addition, the informal carers were intermediate between the active seniors and formal carers. Because the formal carers were younger than the active seniors and informal carers, we considered that these results were affected by shift from feature phones to smart phones. Moreover, the respondents of “None of the options” were less than 1%. As the overall results, usage rate of IT devices is quite high. It is considered to be influenced by the internet inquiry survey.

For the support devices that they use by themselves, the informal and formal carers responded “None of the options” less than the active seniors. We considered that informal and formal carers had positive attitude towards technology use in nursing-care. We hypothesized that active seniors expected to reduce families' burden of nursing-care and to live by themselves without nursing-care by using technologies.

We found that the response rate of “None of the options” in Q4 and Q5 were 20.9% and 20.0% in average respectively. There were not significant differences between them in t-test ( $p = 0.83$ ). We considered that attitude to technology use by themselves and to them were similar among three

groups. Approximately 80% of people agreed to technology use in nursing-care services.

In addition, 76.1% of the participants agreed to use information obtained from support devices for device development. If support devices were robotized, they could acquire more information closely related to daily life such as usage logs and usage environments. The authors considered that we could accelerate the spread of support devices and increase the social positive effects in the future by following the technology cycle that developed technologies to suit care personnel and elderly persons according to information obtained from service fields.

For the individual technologies, the walk assist devices and emergency call systems were expected more than the other devices. We considered that the participants would like to transfer themselves but would likely need help in emergency situations. Additionally, the walk assist and transfer support devices were highly expected by persons who had experienced elderly nursing-care. The eating support devices were highly expected by the active seniors and informal carers who gave care to elderly persons in their own homes. The dementia prevention games were also highly expected by the informal carers who had experienced nursing-care in their homes. We considered that their needs for support devices were affected by their care experience, life style, and care images. Therefore, these results were considered to show relatively frequent problems in nursing-care.

On the other hand, 3.3% of the respondents strongly disagreed with information use for device development. When we use information obtained from support devices, we should give an adequate explanation and obtain informed consent.

Finally, we considered the expectation for technology use in the future. Although the formal carers expected technologies at a significantly lower rate than did the active seniors and formal carers, 87.0% of the participants agreed that technologies will become more common than now, and 91.9% responded that the technologies would be more essential as a whole than now. Therefore, we considered that they were positive and highly expected technology use in nursing-care. We also considered that development of

technologies following their needs would be more important for us.

## 5 CONCLUSIONS

We conducted an inquiry survey on the internet among active seniors, informal carers, and formal carers to compare their attitudes toward elderly nursing-care. Most agreed to and highly expected technology use in nursing-care services. On the other hand, experience of nursing-care affected their attitudes toward future nursing-care services and technologies in nursing-care services. Additionally, we considered that development of technologies following needs would be more important for us.

In the future, we would like to conduct a similar survey in Finland and compare their attitudes with those in Japan to develop new global technologies and support devices.

## 6 ACKNOWLEDGMENT

This study is supported by JST, Strategic International Collaborative Research Program, SICORP.

## 7 REFERENCES

- OECD (2015). OECD Data of demography
- National Institute of Population and Social Security Research (2012), Population Projections for Japan (January 2012): 2011 to 2060, 2012, Accessed on July 14, 2016, [http://www.ipss.go.jp/site-ad/index\\_english/esuikai/ppfj2012.pdf](http://www.ipss.go.jp/site-ad/index_english/esuikai/ppfj2012.pdf)
- Ministry of Health, Labour and Welfare (MHLW) (2015a), Status report of care insurance business (in Japanese).
- Ministry of Health, Labour and Welfare (MHLW) (2015b), Status Report on the Long-term Care Insurance (in Japanese).
- Ministry of Health, Labour and Welfare (MHLW) (2016), Current and Future Role of Public Care Insurance System, Accessed on July 14, 2016, [http://www.mhlw.go.jp/file/06-Seisakujouhou-12300000-Roukenkyoku/201602kaigohokenntoha\\_2.pdf](http://www.mhlw.go.jp/file/06-Seisakujouhou-12300000-Roukenkyoku/201602kaigohokenntoha_2.pdf) (in Japanese).
- Ministry of Health, Labour and Welfare (MHLW) (2014), Securement of human resources for nursing-care (in Japanese).
- Robotic Care (2013). Robotic Care Devices Portal, Accessed on July 14, 2016, <http://robotcare.jp/?lang=en>.
- METESE (2016), METESE project homepage, Accessed on July 14, 2016, <http://www.metese-project.com/>.
- Benjamini, Y. and Hochberg Y. (1995), Controlling the false discovery rate: a practical and powerful approach to multiple testing, *J. R. Statist.*, 57(1), 298-300.