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# Development of a Japanese version of the Advance Care Planning Engagement Survey: Examination of its reliability and validity

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## Abstract

**Objectives.** The importance of supporting advance care planning (ACP) by healthcare professionals is recognized worldwide, and assessing the outcomes, such as people's understanding and readiness for ACP, using an appropriate instrument is essential. We, therefore, developed a Japanese version of the Advance Care Planning Engagement Survey (ACP Engagement Survey; 15 items, 9 items, and 4 items), an international scale for assessing the progress of the ACP, and examined its validity and reliability.

**Methods.** The ACP Engagement Survey was translated into Japanese, back-translated, and culturally adapted, and the final version was reviewed by the author of the original version. Data on basic demographic information and ACP-related experiences were simultaneously collected as external criteria in an online survey of older adults with chronic diseases. The Cronbach's alpha was calculated to assess its internal consistency, and a retest was performed three days later to calculate the intra-class correlation coefficients (ICCs).

**Results.** A total of 200 respondents (mean age 70; 9.5% female) were included in the analysis. None of the items showed a ceiling effect, but several items did exhibit a floor effect. The factor structure was the same 2-factor structure as the original version, and both factors exhibited a high cumulative contribution rate. The Cronbach's alphas were 0.94 (15-item version), 0.91 (9-item version), and 0.95 (4-item version), and ICCs were of 0.88 (15-item version), 0.9 (9-item version), and 0.84 (4-item version).

**Significance of results.** The Japanese version of the ACP Engagement Survey was confirmed to have very good reliability regarding both internal consistency and test-retest reliability. Together with the result of the item analysis, we can conclude that the Japanese version of the ACP Engagement Survey is sufficiently reliable to be utilized in interventional studies, and it has acceptable content validity, construct validity, and criterion-related validity.

## Introduction

Advance care planning (ACP), which involves patients and their surrogate decision-makers discussing the patient's end-of-life care with healthcare professionals, has gained importance with recent advances in medical technology and the social background, and its effectiveness has been validated worldwide (Weathers et al., 2016; Jimenez et al., 2018). Studies have shown that ACP can help individuals receive the desired medical care and health support, improve patient–physician communication, and increase the patient's and family's satisfaction with the end-of-life care (Meeker and Jezewski, 2005; Detering et al., 2010; Murray and Butow, 2010; Ke et al., 2015; Martin et al., 2016).

Previous studies have examined the effectiveness of advance directives (AD) as a method for receiving the desired end-of-life care, but it has been demonstrated that it is limited. The results showed that those who completed AD were not always able to receive the care they had specified in the AD. During the ACP process, patients make vague decisions while imagining their uncertain future. Therefore, merely completing an AD can make it difficult for proxy decision-makers to respond appropriately when circumstances change (The SUPPORT Project). Research has also shown that individual ACP can be at different stages of behavioral change and that appropriately supporting each stage is necessary. Thus, it is particularly important to share the process of discussing future goals and expectations based on the patient's values with their family and/or close friends (Connors et al., 1995; Collins et al., 2006).

In 2018, an international Delphi study was conducted by the European Association for Palliative Care (EAPC) in which they defined ACP as follows: "Advance care planning enables individuals to define goals and preferences for future medical treatment and care, to discuss these goals and preferences with family and healthcare providers, and to record and review these preferences if appropriate." Twelve recommended elements for implementing ACP were also identified, including items such as exploring the patient's experience and knowledge of the subject, values, preferences for future medical treatment, selection of a proxy decision-maker, and the extent to which he/she allows the proxy decision-maker to use his/her discretion. The "recommended endpoints" that should be measured when assessing the effects of interventions for ACP were also identified, including the patient's readiness, self-efficacy, hope, and actual agreement.

Recently, the Japanese Ministry of Health, Labor, and Welfare (MHLW) has surveyed Japanese perceptions of ACP and has begun training nationwide so that healthcare providers can facilitate ACP. As a result of the intervention to promote ACP, an increasing number of healthcare providers and the public have recognized its necessity and effects (Miura et al., 2017). However, only a few people are opting to implement ACP. According to a national survey conducted by the MHLW, more than 60% of elderly people would like to consult their healthcare provider about ACP, but only about 4% have done so (Ministry of Health, Labor, and Welfare, 2019). It has been reported that a large percentage of people in Japan try to avoid topics related to death, and one of the factors of a "good death" as defined by the Japanese is "to live without being aware of death." Also, healthcare providers are aware of the need and responsibility of talking to their patients about their end of life, but they do not know when to start the discussion and want to avoid it. As a result of continuing to avoid end-of-life discussions, often just before the death, the discussion only focuses on whether to perform a particular medical procedure, such as cardiopulmonary resuscitation or the use of a ventilator.

ACP can include content that requires expertise, such as end-of-life care and flexibility for proxy decision-making. As such, ACP facilitators need to accurately assess how well people understand ACP and how effective they are providing the appropriate support in each situation. The Advance Care Planning Engagement Survey (ACP Engagement Survey), created by Sudore et al. (2013), is a useful tool for evaluating the ACP process. It was designed to assess people's past and current actions and processes regarding ACP and to detect the change in response to ACP interventions. This scale was developed based on social cognitive theory (Bandura, 1977) and behavioral change theory (Street, 2003). It focuses on four behavioral change components (knowledge, reflection, self-efficacy, and readiness) in four ACP domains (the proxy decision-maker, values and quality of life, proxy decision-making margin, and questions for doctors). It also includes questions about the desired medical care and the involvement of doctors, friends, and family members in the ACP. These categories were adopted in accordance with the endpoints recommended in the above-mentioned EAPC white paper.

However, no tool exists that can evaluate the ACP process in Japanese. If a Japanese version of this scale can be developed and tested, it will be possible to understand the readiness of Japanese people for the ACP and use it to consider the timing and setting of ACP support and communication. Therefore, the purposes of this study were to develop the Japanese version of the ACP Engagement Survey that can be used to evaluate the ACP process based on behavior change theory and to examine its validity and reliability.

## Methods

### The ACP Engagement Survey

In this study, the Japanese version of the ACP Engagement Survey was targeted for development. This tool uses a 5-point Likert scale to capture the knowledge, reflection, self-efficacy, and readiness for the ACP process, as identified in behavior change theory. After being developed as an 82-item version, shortened versions (with 34, 15, 9, and 4 items) were created, and their validity and reliability were verified (Sudore et al., 2017a). In this study, we translated three of the shortened versions (15, 9, and 4 items) into Japanese, adapted them to the Japanese culture, and examined their validity and reliability. In the versions with 15 items or less, the ACP process is evaluated using items that are related to the two factors of self-efficacy and readiness (from among the four processes). For the self-efficacy items, a 5-point Likert scale (1 = none to 5 = very much) is adopted. Readiness is measured using the following five options: "I have never thought about it," "I have thought about it, but I am not ready to do it," "I am thinking about doing it in the next 6 months," "I am planning to do it in the next 30 days," and "I have already done it." The score is the average value, and the score ranges from 1 to 5. The higher the score, the more engaged in the ACP process the patient is. In the original paper, Sudore et al. reported that the scale's Cronbach's alpha was 0.9.

### Translation process

After obtaining permission from the original author of the ACP Engagement Survey to translate and validate it in Japanese, the Japanese version of the scale was prepared in accordance with guidelines (Beaton et al., 2000). It was translated into Japanese by one translator and two Japanese researchers in the healthcare field who are fluent in English. There was no fatal difference between their translations. Three translators discussed each translation and selected words and sentences that are more suitable for the Japanese culture. Specifically, "readiness" was translated as "kokoronojyunbi," a word close to the meaning of "ready," but was changed to "kokorogamae," which is closer to the meaning of preparedness. Also, "the end of their life" was changed from "syumatsuki" to "jinseinosaisyudankai" which is recommended by the Ministry of Health, Labour and Welfare in Japan. Then, two Japanese–English bilingual medical dissertation translators translated it back into English. We confirmed the consistency between the Japanese version and the original version with the original author.

### Healthcare professionals' expert review

To secure the content relevance, we asked two doctors, two nurses, and two researchers who are experts in palliative care and ACP to review the Japanese version of the scale. They checked whether the items of this scale were correct and suitable for the current state of medical care and ACP in Japan. The item-level-CVI (I-CVI) was calculated as a content validity indicator for each item as a scale to confirm experts' agreement on the need for the item (Lynn, 1986). We also calculated the scale-level-CVI (S-CVI) as a content validity indicator for the entire scale (Polit and Beck, 2006). As a result, all items were judged to be relevant by all six of the respondents, and both I-CVI and S-CVI were 1.0, so we did not remove any items. Based on their opinions, we modified some of the scale items to better suit Japanese culture. For example, the act of "writing and signing a decision on an official papers" is not common in Japan and is not culturally appropriate because of the large psychological barriers, and changed the sentence to mean "record the decisions in some document." In a specific example, the question "How ready are you to sign official papers naming a person or group of people to make medical decisions for you?" is replaced by "How ready are you to record the name of a person or group of people to make medical decisions for you on any document?"

## Pilot study (content validation through a cognitive interview)

We conducted a pilot study to confirm the face validity of this scale. Ten patients with chronic diseases responded to the Japanese version of the ACP Engagement Survey. All participants were interviewed after completing the questionnaire. Referring to previous research, we asked about "difficult to answer," "confusing," "difficult to understand," and "upsetting/offensive" using a 4-point Likert scale (Koller et al., 2007). Participants rated each item of the scale as "easy to understand" and "no problem." The response time of the 15-item version of the scale was about 5 min. Based on these results, we decided not to change this scale.

After all cultural adjustments and corrections were completed, the final Japanese version was back-translated. We asked the original authors for confirmation of this and obtained their consent to publish the Japanese version.

## Participants and recruitment procedure

To examine the validity and reliability of this scale, we conducted a web-based survey of elderly people with chronic diseases in Japan. The web-based survey was conducted as a cross-sectional study between February 2018 and September 2018. We recruited people aged 65 years and over who were registered with a Japanese research company, and we emailed the survey information to them through the research company.

We screened patients with chronic illnesses who were visiting a hospital more than once every three weeks, which constituted the inclusion criteria, and provided the details of this web-based study to those who met the inclusion criteria. Those who understood and agreed with this study were invited to participate in the web-based survey. The sample size was set to 200 with reference to the standard recommended by COSMIN (Amsterdam, The Netherlands). Ultimately, 200 patients who met the inclusion criteria agreed to participate in the study, and all responded to the questionnaire.

## Data collection

Participants who agreed to take part in this study completed a questionnaire on the website. Besides investigating the Japanese version of the ACP Engagement Survey, the following variables were collected: basic demographic information including age, self-reported health status, health literacy (Ishikawa et al., 2008), and self-reported prior planning activities. The questions about the previous planning activities were the same as in the original study. They included self-report yes/no questions, such as "Have you ever completed an advance directive?" and "Have you made your funeral plans?" Participants were also asked their experience of discussing end-of-life care with doctors and their families in terms of the previously planned activities, such as "Have you told your doctor about your preferences for end-of-life care?" and "Have you told your friends or family about your preferences for end-of-life care?" To examine the survey's test-retest reliability, three days after the initial survey, we conducted a second survey using the ACP Engagement Survey that involved 44 people.

## Data analysis

For the sociodemographic data, the mean or percentage and standard deviation (SD) were calculated as the descriptive statistics.

### Item exclusion criteria

The exclusion of items was decided by examined the ceiling/floor effect and performing item-total correlation analysis and item correlation analysis. An exploratory factor analysis was also conducted in which items were excluded if they had a factor loading of less than 0.35 for any one factor or more than 0.35 for multiple factors.

### Examination of the reliability

To evaluate the intra-rater reliability, retests were performed three days after the initial survey, and the intra-class correlation coefficients (ICCs) were obtained. The ICC [2, 1] were calculated using a 2-way mixed-effects model. An ICC ≥ 0.9 indicates excellent reliability, ≥0.8 indicates good reliability, ≥0.7 indicates moderate reliability, ≥0.6 indicates fair reliability, and <0.6 indicates poor reliability (Shrout and Fleiss, 1979). The reliability was confirmed using the Cronbach's alpha, which is an estimate of reliability that considers all possible split-half methods. Cronbach's alpha is generally considered acceptable when it is ≥0.70 (Terwee et al., 2007).

### Examination of the validity

The construct validity of the Japanese version was verified by confirming the factor structure by conducting an exploratory factor analysis. The comparison with external standards was also confirmed by examining the correlation between each item of the Japanese version and experience of ACP-related activities.

## Ethical consideration

This study was conducted with the approval of the Ethics Committee of the University of Tokyo (approval number: 11270-[1]), and all participants gave informed consent.

# Results

The participants' characteristics are shown in Table 1. Of the participants, 90.5% were male, 72% had a college degree or above, half had cardiovascular disease, and 39% had a malignant tumor.

## Item score distribution

The mean values and SDs of all 15 items were checked, and no ceiling effect was observed in any item. The floor effect was found in 9 items.

The item-total correlations were 0.51–0.85, and no items with a particularly weak correlation were found (Table 2). The factor loadings in the exploratory factor analysis were 0.46–0.93, there were no items that had a loading of less than 0.35, and no items had a loading of more than 0.35 in the multiple factors.

**Table 1.** Patient characteristics

| | Total $n = 200$ | |
|---|---|---|
| | *n* | % |
| Sex | | |
| Male | 181 | 90.5 |
| Female | 19 | 9.5 |
| Age | | |
| Mean ± SD | 70.55 | 3.5 |
| Education | | |
| Junior high school | 2 | 1.0 |
| High school | 39 | 19.5 |
| College | 14 | 7.0 |
| University | 127 | 63.5 |
| Postgraduate | 18 | 9.0 |
| Employment | | |
| Full-time | 112 | 51.0 |
| Other | 98 | 49.0 |
| Type of disease | | |
| Cardiovascular | 100 | 50.0 |
| Respiratory | 29 | 14.5 |
| Cancer | 78 | 39.0 |
| Kidney disease | 2 | 1.0 |
| Other | 48 | 24.0 |
| Hospitalization experience | | |
| Yes | 169 | 84.5 |
| No | 31 | 15.5 |
| Nursing care experience | | |
| Yes | 54 | 27.0 |
| No | 146 | 73.0 |
| Living with family | | |
| Yes | 222 | 91.0 |
| No | 18 | 9.0 |
| Health literacy | | |
| Mean ± SD | 3.74 | 0.662 |

## Examination of the reliability

The Cronbach's alpha of this scale was 0.94 for the 15-item version, 0.91 for the 9-item version, and 0.95 for the 4-item version. In each scale, the Cronbach's alpha when each item was excluded was 0.89–0.90, which was lower than that of each scale when no item was excluded.

To evaluate the inter-rater reliability, the ICC was calculated for the 44 participants who responded to the survey that was conducted three days later (28 males and 16 females, average age = 67.1 years). The ICC of the total score was 0.88 for the 15-item version, 0.9 for the 9-item version, and 0.84 for the 4-item version. The ICC of the different items ranged from 0.56 to 0.88.

**Table 2.** Internal consistency of the ACP Engagement Survey

| Question | Mean score | SD | Item-total correlation | Alpha if item removed |
|---|---|---|---|---|
| 1 | 3.42 | 1.22 | 0.57 | 0.90 |
| 2 | 2.20 | 1.35 | 0.67 | 0.89 |
| 3 | 1.91 | 1.20 | 0.62 | 0.89 |
| 4 | 1.94 | 1.16 | 0.54 | 0.90 |
| 5 | 3.13 | 1.29 | 0.72 | 0.89 |
| 6 | 3.09 | 1.28 | 0.69 | 0.89 |
| 7 | 2.04 | 1.23 | 0.62 | 0.89 |
| 8 | 1.91 | 1.10 | 0.66 | 0.89 |
| 9 | 1.99 | 1.14 | 0.46 | 0.90 |
| 10 | 3.16 | 1.21 | 0.63 | 0.89 |
| 11 | 3.15 | 1.22 | 0.68 | 0.89 |
| 12 | 2.02 | 1.14 | 0.68 | 0.89 |
| 13 | 1.92 | 1.09 | 0.70 | 0.89 |
| 14 | 3.08 | 1.19 | 0.50 | 0.90 |
| 15 | 2.14 | 1.21 | 0.57 | 0.90 |

SD = standard deviation.
Scores ranged from 1 to 5 points.

## Exploratory factor analysis

An exploratory factor analysis was performed with the number of items in the original version, without excluding any items, and the factor structure that was revealed is shown in Table 3. As a result of the factor analysis that used varimax rotation and the principal factor method, the 15-item version and 9-item version were found to consist of two factors, and the 4-item version consisted of one factor. The factor loading was 0.5 or more for the items that constituted each factor, which was higher than the factor loading for the other factor.

The cumulative contribution of the two factors was 72.0% for the 15-item version and 73.6% for the 9-item version. In the 4-item version, it was 85% for the one factor. The contribution ratio of each factor to the total was 43.9% and 28.1% in the 15-item version.

## Correlations between the ACP Engagement Survey and the ACP-related experiences

The results of the comparison of the ACP-related experiences and Japanese version of the ACP Engagement Survey are shown in Table 4. The ACP Engagement Survey scores were significantly higher for those who had the ACP-related experiences of "I have filled out a living will or advance directive," "I have told my doctor about my preferences for end-of-life care," and "I have told my friends or family about my preferences for end-of-life care" than for those who had no relevant experience.

## Discussion

In this study, we conducted a survey of elderly people with chronic diseases to develop a Japanese version of the ACP

**Table 3.** Factor loading values of the 15-item version of the ACP Engagement Survey

| | Item | Factor 1 Readiness | Factor 2 Self-efficacy |
|---|---|---|---|
| 8 | How ready are you to talk to your doctor about the kind of medical care you would want if you were very sick or near the end of life? | **0.930** | −0.041 |
| 13 | How ready are you to talk to your doctor about how much flexibility you want to give your decision maker? | **0.905** | −0.017 |
| 9 | How ready are you to sign official papers putting your wishes in writing about the kind of medical care you would want if you were very sick or near the end of life? | **0.879** | −0.109 |
| 3 | How ready are you to talk with your doctor about who you want your medical decision maker to be? | **0.863** | −0.036 |
| 4 | How ready are you to sign official papers naming a person or group of people to make medical decisions for you? | **0.834** | −0.067 |
| 12 | How ready are you to talk to your decision maker about how much flexibility you want to give them? | **0.832** | 0.033 |
| 7 | How ready are you to talk to your decision maker about the kind of medical care you would want if you were very sick or near the end of life? | **0.774** | 0.094 |
| 2 | How ready are you to formally ask someone to be your medical decision maker? | **0.582** | 0.229 |
| 15 | How ready are you to ask your doctor questions to help you make a good medical decision? | **0.572** | 0.143 |
| 14 | How confident are you that today you could ask the right questions of your doctor to help make good medical decisions? | 0.049 | **0.670** |
| 11 | How confident are you that today you could talk with your doctor about how much flexibility you want to give your medical decision maker? | 0.023 | **0.867** |
| 5 | How confident are you that today you could talk with your medical decision maker about the care you would want if you were very sick or near the end of life? | 0.018 | **0.869** |
| 1 | How confident are you that today you could ask someone to be your medical decision maker? | 0.005 | **0.590** |
| 6 | How confident are you that today you could talk with your doctor about the care you would want if you were very sick or near the end of life? | 0.004 | **0.812** |
| 10 | How confident are you that today you could talk with your decision maker about how much flexibility you want to give them? | −0.075 | **0.896** |

Maximum likelihood method and promax rotation.
Factor loadings above 0.35 are marked in bold.

Engagement Survey. The results showed that it has high internal consistency and high construct validity.

The study participants were elderly people with chronic illnesses who regularly visited the hospital, and they had an average age of 70.6 years. The participants of the original study were chronic disease patients with a mean age of 65 years who were attending or hospitalized in a hospital in San Francisco or Canada (Sudore et al., 2017b). While the average age of the participants in the current study was slightly higher than that in the original study, their educational level and health literacy were also higher. This may be because we recruited participants from a pool of web-based survey registrants who can use a personal computer without difficulty.

The average ACP Engagement Survey score (SD) in this study was 3.16 (1.02) for the 15-item version, 3.11 (1.09) for the 9-item version, and 2.70 (1.22) for the 4-item version, and these scores were 0.6–0.7 points lower than in the original. Very few people have the opportunity to have conversations on ACP in Japan, which was expected from the results of several previous studies in Japan (Aoki et al., 2017; Ministry of Health, Labor, and Welfare, 2019). Therefore, floor effects were detected in several items. This may reflect a lack of knowledge and awareness of the significance of the ACP among the Japanese, as well as barriers to talking and thinking about the end of life (Musa et al., 2015). However, according to a 2014 national survey, 60% of respondents showed a willingness to have discussions on end-of-life care, and the ACP Engagement Survey scores may change if support is provided to meet these needs in the future.

The Cronbach's alpha was 0.9 or more, which is as high as in the original version. The Cronbach's alphas when each item was excluded were 0.89–0.90, and there was no case in which the Cronbach's alpha of the complete scale was exceeded when no items were excluded. The item-total correlation was 0.5 or more for all items, and no inconsistent items were found. Therefore, there were no items on this scale that lacked internal consistency, and we decided not to exclude any items.

The ICCs of the total score were 0.88 for the 15-item version, 0.9 for the 9-item version, and 0.84 for the 4-item version, all of which exceeded 0.7 and were acceptable (Terwee et al., 2007). However, the ICC of the different items ranged from 0.56 to 0.88, and 7 items were 0.7 or less. The ACP Engagement Survey score can be updated quickly and easily because people can start ACP immediately if they have the opportunity (Sudore et al., 2017a). Therefore, the period from the first test to the retest was short. However, because this scale contains information about what ACP is and what it should do, the participants may have been able to take action for ACP based on the knowledge gained from the first questionnaire. Although we estimated the target sample size for the retest to be around 50, the number of participants in the second survey was 44. However, for the reasons mentioned above, it was determined that it would be difficult to verify the intra-rater reliability of this scale through the test-retest method and no additional survey was conducted.

As a result of the exploratory factor analysis, as in the original study, the 15-item version and 9-item version consisted of two factors, and the 4-item version consisted of one factor, and the

**Table 4.** Association between the ACP Engagement Survey scores and pre-planning activities

| | Completed AD | | No AD | | |
|---|---|---|---|---|---|
| | *n* = 11 | | *n* = 189 | | |
| | Mean | SD | Mean | SD | *p** |
| 15 items | 3.8 | 1.3 | 2.4 | 0.8 | 0.004 |
| 9 items | 3.9 | 1.3 | 2.3 | 0.8 | <0.001 |
| 4 items | 4.0 | 1.4 | 1.9 | 0.9 | <0.001 |
| | Talk to physician | | No talk | | |
| | *n* = 12 | | *n* = 188 | | |
| 15 items | 3.4 | 1.0 | 2.4 | 0.9 | <0.001 |
| 9 items | 3.4 | 1.1 | 2.3 | 0.9 | 0.007 |
| 4 items | 3.4 | 1.4 | 1.9 | 1.0 | 0.002 |
| | Talk to family | | No talk | | |
| | *n* = 46 | | *n* = 154 | | |
| 15 items | 2.9 | 0.8 | 2.3 | 0.9 | <0.001 |
| 9 items | 2.9 | 0.9 | 2.2 | 0.9 | <0.001 |
| 4 items | 2.5 | 1.0 | 1.8 | 1.0 | <0.001 |
| | Funeral plans | | No plans | | |
| | *n* = 51 | | *n* = 149 | | |
| 15 items | 2.9 | 0.9 | 2.3 | 0.9 | <0.001 |
| 9 items | 2.8 | 1.0 | 2.3 | 0.9 | <0.001 |
| 4 items | 2.3 | 1.2 | 1.8 | 1.0 | <0.001 |

AD = advance directive; SD = standard deviation.
Scores are based on the average 5-point Likert scale score.
*Calculated using the *t*-test.
Completed AD: "Have you ever completed an advance directive?"
Talk to physician: "Have you told your doctor about your preferences for your end-of-life care?"
Talk to family: "Have you told your friends or family about your preferences for your end-of-life care?"
Funeral plans: "Have you made your funeral plans?"

contribution ratio of each was 70% or more, which was a sufficient value (Terwee et al., 2007). All of the items had factor loadings of 0.5 or more for either factor, and no items needed to be excluded (Terwee et al., 2007). Each factor also had the same structure as the original. The first factor consists of 9 items, and it is classified as "readiness," and the second factor is classified as "self-efficacy," and it contains 6 items.

When the score was compared between the groups with and without the experience of ACP-related activity, the score of all 3 items was significantly higher than in the group with experience. This confirmed that the scores of this scale work in conjunction with similar external criteria.

The results of each item showed that readiness and self-efficacy for communicating one's decisions to a proxy decision-maker tended to be relatively high, while readiness and self-efficacy for communicating to a doctor tended to be low. Japan has long had an ingrained culture of medical care based on the paternalistic views of physicians, and thus the elderly, in particular, tend to be reluctant to make decisions about their medical care and not to voice their opinions to physicians whom they consider to be high up in the hierarchy.

This may be one of the reasons why older people are not actively engaged in ACP.

On the other hand, many Japanese do not want to burden their families, who are proxy decision-makers. One of the benefits of having an ACP discussion is that it can reduce the conflict and difficulty of family members in decision-making situations on behalf of the patient when the patient's decision-making capacity is lost, thus reducing the burden on the family. In order to promote ACP in older Japanese patients, it may be useful to explain the significance of ACP and then focus interventions on helping patients to bring the topic to their physicians. Evaluating new ACP support efforts by health care providers using this scale may help us identify which interventions are effective.

There are several limitations to this study. First, the participants were limited to elderly patients with chronic diseases. This limits the generalizability of the results to other age groups. However, given a large number of elderly people living with some chronic disease, it is possible to assume that the results of this study can be applied to the elderly in general. Second, most of the participants were male. The gender of computer users among the elderly in Japan is skewed toward male users, and inevitably, participants in the web survey are also skewed toward male users. For this reason, the number of women surveyed in this study was small. It is hoped that additional research will be conducted on women in the future. Third, we detected floor effects on several items. It may be difficult to detect population differences in observational studies that do not involve intervention such as the present study. It is expected that more data from various subject groups will be accumulated, compared, and more verification studies will be conducted utilizing this scale.

## Conclusions

The Japanese version of the ACP Engagement Survey was confirmed to have very good reliability regarding both internal consistency and test-retest reliability. Together with the result of the item analysis, we can conclude that the Japanese version of the ACP Engagement Survey is sufficiently reliable to be utilized in interventional studies, and it has acceptable content validity, construct validity, and criterion-related validity. This scale will be improved through widespread use in research on a variety of ACP-related topics. Furthermore, the scale, which is considered to be an international standard of evaluation, is not only very useful for assessing the progress of ACP support efforts in Japan, but it also allows us to compare the results of studies using this scale with those obtained in other countries, and to help us to examine ways to improve ACP support by healthcare providers in our country.

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**Conflict of interest.** The authors declare that they have no competing interests.

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