

TABLE 5 Most Frequent Clinical Scenarios for Nonacute PCIs Classified as Inappropriate and Uncertain by AUC/2012

AUC/2012 Scenario No.	Anatomy	Indication				n (%)
		Previous CABG	Symptoms	Cardiac Risk	Antianginal Medication	
Inappropriate PCIs						745
20a	1- or 2-vessel CAD, no proximal LAD involvement	No	Asymptomatic	Not performed	Not available	447 (18.4)
16a	1- or 2-vessel CAD, no proximal LAD involvement	No	Asymptomatic	Intermediate	None or minimal	146 (6.0)
14a	1- or 2-vessel CAD, no proximal LAD involvement	No	Asymptomatic	Low	None or minimal	60 (2.5)
14b	1- or 2-vessel CAD, no proximal LAD involvement	No	CCS class I or II	Low	None or minimal	57 (2.3)
58a	≥1 stenoses in non-CABG territory, all bypass grafts patent	Yes	Asymptomatic	Intermediate	None or minimal	13 (0.6)
26a	CTO of 1 major coronary artery without other coronary stenoses	No	Asymptomatic	Intermediate	None or minimal	12 (0.5)
Uncertain PCIs						990
20b	1- or 2-vessel CAD, no proximal LAD involvement	No	CCS class I or II	Not available	Not available	524 (21.6)
16b	1- or 2-vessel CAD, no proximal LAD involvement	No	CCS class I or II	Intermediate	None or minimal	174 (7.2)
32b	1-vessel CAD involving the proximal LAD	No	CCS class I or II	Intermediate	None or minimal	49 (2.0)
38a	2-vessel CAD involving the proximal LAD	No	Asymptomatic	Intermediate	None or minimal	42 (1.7)
18a	1- or 2-vessel CAD, no proximal LAD involvement	No	Asymptomatic	High	None or minimal	29 (1.2)

Abbreviations as in Tables 1 to 4.

2012, the rate of inappropriate PCIs increased to nearly one-third because noninvasive stress testing was not performed before a large number of elective PCIs in Japan and was seemingly affected by the increasing trend of coronary CTA.

Under the original criteria (AUC/2009), the proportion of inappropriate procedures in our study was almost within the range reported in previous studies. Similar to our study, previous reports have shown that almost all coronary revascularization procedures performed in the acute setting were appropriate (4,6), whereas ratings in nonacute settings varied widely, from 11.6% to 17% depending on the study (4-6,15). Additionally, the characteristics of the nonacute procedures that we classified as inappropriate were also concordant with those reported in previous studies. Inappropriate PCIs were likely to be performed in patients who were either asymptomatic or mildly symptomatic (Canadian Cardiovascular Society class I or II), were receiving suboptimal antianginal medication, and had no PLAD coronary artery stenosis. In our study, the proportion and indications of inappropriate PCIs in Japan were similar to the results of previous studies from North America, which indicates that AUC/2009 may be useful for assessing the appropriateness of PCIs internationally. The same approach, including the education of physicians regarding procedural appropriateness, is needed to improve patient selection in nonacute settings globally.

Between the 2009 and 2012 criteria, the proportion of inappropriate procedures increased substantially from 15.0% to 30.7% in our registry, whereas Hannan et al. (5) reported that the percent

of inappropriate PCIs using New York State's Cardiac Surgery Reporting System and the Percutaneous Coronary Interventions Reporting System would increase from 14.3% with AUC/2009 to 23.2% when AUC/2012 was applied. These increases were mainly explained by the following scenario: asymptomatic patients who did not undergo previous noninvasive testing, presence of 1- or 2-vessel CAD, and no PLAD involvement (indication 18a in AUC/2009, indication 20a in AUC/2012). In AUC/2009, this clinical scenario was not rated because the panel members thought that its likelihood was very low. However, these cases would appear to be particularly inappropriate for revascularization because there is no expectation of survival benefit and no possibility of improvement in quality of life. Accordingly, in the revised version AUC/2012, such cases were rated as inappropriate (10). Therefore, the greater increase in inappropriate procedures in our registry compared with the Hannan et al. (5) study is a reflection of the unwillingness to perform previous noninvasive stress testing in Japan.

Less frequent use of noninvasive stress testing may be due to the advent of coronary CTA, which has become recognized as a useful prognostic modality (16). In fact, approximately one-third of the patients in our registry who did not undergo noninvasive stress testing underwent coronary CTA. Furthermore, the proportion of inappropriate PCIs increased substantially in parallel with the increase in the use of coronary CTA. Because appropriateness criteria assign much value to functional information in reflection of a strong tilt toward physiological assessment of ischemia in the United States, coronary CTA, which

only provides anatomic information, is not recognized as one of the previous noninvasive tests under these criteria. In recent studies, the excellent negative predictive value and acceptable positive predictive value with diagnostic use of coronary CTA have been documented (17,18), and the analyses from the CONFIRM registry have demonstrated the prognostic value of coronary CTA. Those patients with non-obstructive or obstructive CAD detected by coronary CTA had an increased risk of long-term mortality compared with those without (16), which might indicate that the risk of adverse cardiovascular events could be stratified by the extent of anatomic lesions. Additionally, subanalysis of the COURAGE trial demonstrated that the anatomic burden of coronary disease, but not ischemic burden, predicted the risk of adverse cardiovascular events (19), which emphasized the importance of anatomic as well as ischemic assessment in patients with CAD. Because such a potential impact of anatomic assessment on adverse cardiovascular outcomes has been demonstrated, we can argue that CT-based procedures can be hypothetically graded as appropriate instead of inappropriate. In our analysis, the proportion of inappropriate PCI decreased by 5% when CT-based procedures were classified not as inappropriate but as appropriate. This proportion of inappropriate PCIs was similar to the findings of earlier reports assessed using revised 2012 criteria (5). This result might demonstrate that the appropriateness of PCIs in Japan was not properly assessed according to the current criteria because the recognition of CAD was totally different from that in the United States. Further studies are needed to evaluate the appropriateness of CT-guided PCIs, which may suggest that a revision of AUC is needed.

Although revascularization for patients who show no signs of functional ischemia is not the standard of care under current guidelines (20), ischemic evaluation is likely to be performed using FFR without a previous stress test, on the basis of the results of the FAME2 (Fractional Flow Reserve versus Angiography for Multi-vessel Evaluation II) study (21). Actually in our registry, the prevalence of PCIs using FFR substantially increased, which coincided with an increase in coronary CTA use. The number of inappropriate PCIs showed an increasing trend even when the CT-based procedures were excluded (or considered appropriate). This may be due to the increase in the use of FFR. Because FFR enables the evaluation of the significance of CAD in the cardiac catheterization laboratory, pre-procedural tests might have been omitted in some of the patients. Among the patients mapped to scenario 20a under

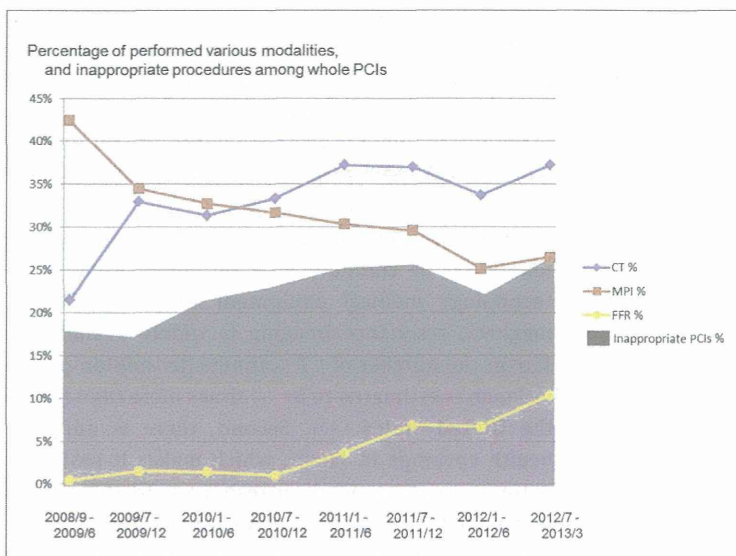


FIGURE 3 Association Between Temporal Trends of Noninvasive Testing and Frequency of Inappropriate Ratings

Gray area indicates the percentages of inappropriate procedures on the basis of original appropriateness criteria (AUC/2009). CT = computed tomography; FFR = functional flow reserve; MPI = myocardial perfusion imaging; PCI = percutaneous coronary intervention.

AUC/2012, almost one-tenth underwent FFR. This trend may indicate that methods for evaluating ischemia have been changing. However, in AUC/2009 or AUC/2012, ischemic evaluation by FFR is

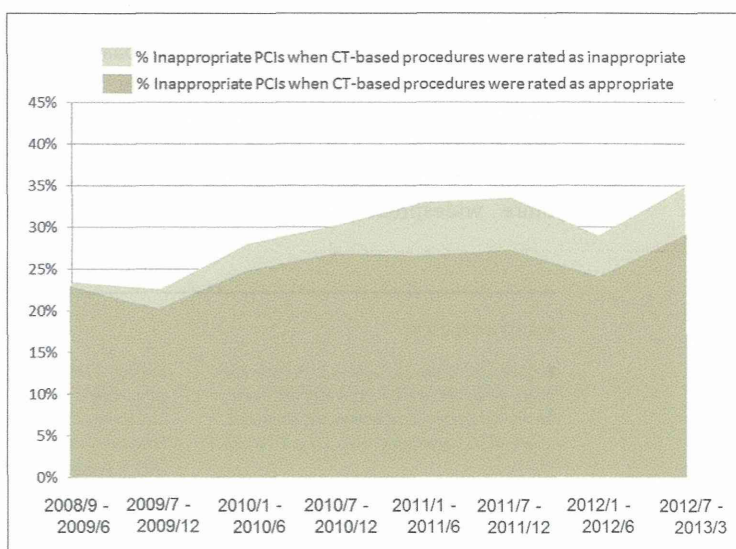


FIGURE 4 Change in the Proportion of PCIs Rated as Inappropriate When CT-Based Procedures Were Classified Not as Inappropriate but as Appropriate

Light brown indicates the trend of proportion of inappropriate PCIs when CT-based procedures were rated as inappropriate. Dark brown indicates the trend of proportion of inappropriate PCIs when CT-based procedures were rated as appropriate. Abbreviations as in Figure 3.

accepted only for 1- or 2-vessel CAD with borderline stenosis of 50% to 60%. The use of FFR in coronary artery stenosis >60% was not adjudicated, which was also mentioned in the previous study (4). In view of this, there is room for improvement in AUC/2009 or AUC/2012 to permit a more precise evaluation of appropriateness.

There are several reasons for the wide implementation of coronary CTA in Japan. First, high-technology medical equipment including CT and magnetic resonance imaging is widely available in Japan; the number of CT scanners per million people in Japan is estimated to be >7 times more than that in the United States (22). Second, there is universal health coverage in Japan, which makes it easier for patients to access medical resources. In 1961, Japan managed to extend social health insurance to the entire population and achieved universal health coverage (23). This health policy is equally applied to all healthcare facilities, and the provision of equal medical services is achieved across the entire nation. Further studies focused specifically on coronary CTA are needed to close this scientific gap in PCI indications.

STUDY LIMITATIONS. For a thorough understanding of our results, several limitations should be acknowledged. First, not all hospitals that perform PCI in Japan participate in our registry. Our registry, however, is multicenter and includes a relatively large number of procedures. We believe that this is one of the representative Japanese databases on PCI patients and that our results comprise the most complete assessment of practice patterns throughout Japan currently.

Second, the use of coronary CTA has become more widespread in Japan compared with the

United States. In 2010, the percent of PCI patients evaluated with coronary CTA was >30% in Japan, whereas it was only 2.7% in the United States (8). Although there is a significant gap in the use of coronary CTA, the temporal trends of noninvasive testing, in which previous anatomic assessment has been increasing, are similar in both countries. This means that similar trends regarding appropriateness of PCIs will be highlighted in the near future in the United States.

CONCLUSIONS

In a multicenter Japanese PCI registry, approximately one-sixth of PCIs were rated as inappropriate under the AUC/2009 in nonacute settings, and the rate of inappropriate PCIs increased to approximately one-third on the basis of the revised AUC/2012. The significant changes in the inappropriate PCI rating between the 2009 and 2012 criteria may be due to the technological evolution of cardiovascular imaging, which continues to evolve in everyday cardiology practice. Further effort is needed to refine and correct the growing disconnection between the AUC and modern pre-PCI evaluation.

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KEY WORDS appropriateness use criteria, percutaneous coronary intervention, quality of care

APPENDIX For supplemental tables and information, please see the online version of this article.

Original Article

Assessment of the Validity and Internal Consistency of a Performance Evaluation Tool Based on the Japanese Version of the Modified Barthel Index for Elderly People Living at Home

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Abstract. [Purpose] This study aimed to examine the validity and internal consistency of the Japanese version of a performance evaluation tool for activities of daily living (ADL) based on the modified Barthel Index (PET-MBI) among elderly people at home. [Subjects] The subjects were elderly people living at home in Japan. [Methods] A cross-sectional study was performed at five home care facilities for elderly people in Japan. ADL performance was evaluated for 128 participants using the PET-MBI, which included 10 self-care items. We used confirmatory factor analysis to estimate the factorial validity. We assessed data model fitness with the χ^2 statistic, the Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA). Cronbach's alpha coefficient was used to determine the internal consistency. [Results] The mean age of the participants was 79.1±8.9 years. Among the 126 participants included in the analysis, 67 were women (53.2%). The single-factor model demonstrated a fair fit to the data, with the χ^2 statistic = 74.9 (df=35), GFI = 0.88, AGFI = 0.81, and RMSEA = 0.096, and the path coefficients of each item ranged from 0.44 to 0.95. The alpha coefficient of the 10-item scale was 0.93. [Conclusion] The PET-MBI for elderly people at home was well validated.

Key words: Activities of daily living, Internal consistency, Validity

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INTRODUCTION

The ability to perform activities of daily living (ADL) is an important component of quality of life for elderly individuals¹⁻⁴. The International Classification of Functioning, Disability, and Health (ICF) defines “performance” as what an individual does in his/her current environment, whereas “capacity” is an individual's ability to execute a task or an action in a “uniform” or “standard” environment⁵.

The Barthel Index (BI) is a popular instrument for assessing ADL^{6,7}. It assesses a patient's capacity to perform 10 daily tasks without assistance and provides a summed, overall BI score that reflects the patient's level of independence. Of various suggested modifications⁸⁻¹¹, Collins et

al. specifically emphasized scoring based on performance rather than capacity^{6,8}, and Shah et al. proposed a five-point scale to increase responsiveness to changes in ADL^{6,11}.

Combining performance-based assessment with responsiveness to change, we established a Japanese version of the performance evaluation tool based on the modified BI (PET-MBI) for institutionalized elderly people in Japan. Given that the PET-MBI scores as zero both “needs full assistance” and “not required” for elderly self-care, reasons for a zero score are included for clarification. In particular, the item “stair climbing” was not evaluated (i.e., scored as zero because it is “not required”) because very few institutionalized participants in our previous study actually needed to climb stairs in their daily lives¹². Therefore, that study only confirmed validity and internal consistency with nine items of the PET-MBI. However, the BI and MBI are known as evaluation tools with 10 items related to self-care. The current study aimed to establish the validity and internal consistency of the 10-item PET-MBI for ADL assessment in elderly people living at home.

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SUBJECTS AND METHODS

To examine the factorial validity and internal consistency of the PET-MBI, we recruited participants from patients registered at five home care facilities (day care or home visit rehabilitation services for elderly people) in Kyoto, Shiga, and Nagano, Japan. The PET-MBI was used to evaluate 128 volunteers out of the 200 individuals registered at these five facilities (57 participants out of 109 registered patients at two day care services; 71 participants out of 91 registered patients at three home visit rehabilitation services). Participant demographics and diagnoses were extracted from medical records, and participants underwent Mini Mental State Examination (MMSE)^{13, 14} testing administered by trained staff on-site. In this study, cognitively impaired participants were included because they were living at home in real settings.

An occupational therapist or physical therapist working at each service evaluated ADL performance using the PET-MBI in December 2010. Therapists obtained information about the tasks from direct observation, written records, or communication with the care manager or caregiver. For example, the therapists directly observed the participants' ADL, and they were instructed to gather information from caregivers and participants according to the PET-MBI evaluation sheets.

The study protocol was approved by the Ethics Committees of the Seijoh University Faculty of Care and Rehabilitation (2010C0014) and Kyoto University Graduate School and Faculty of Medicine, Ethics Committee (E1011). Although the five participating facilities did not have ethics committees, each facility's director approved the study, and notices of the study were posted at each facility. The objective of the study was explained to participants and their families, and written consent was obtained.

To estimate factorial validity and approximate construct validity, we performed confirmatory factor analysis (CFA) using a generalized least squares method to certify the factorial validity of the 10 items based on the PET-MBI. We assessed data model fitness with the χ^2 statistic, the Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA). The goodness of fit was evaluated by the following criteria: GFI > 0.85, AGFI > 0.80¹⁵, and RMSEA < 0.10 (or < 0.08 in reasonable approximate fit)¹⁶. Cronbach's coefficient alpha^{17, 18} was used to determine the internal consistency of all ADL tasks. Analyses of CFA was performed with IBM SPSS Amos 19.0, and Cronbach's coefficient alpha was calculated with SPSS 17.0 J.

RESULTS

Data from 126 of the 128 participants were analyzed (data were incomplete for two patients). As shown in Table 1, 43 of the 126 (34.4%) participants achieved MMSE scores lower than 18 points, indicating cognitive impairment. The results for the 10 tasks as assessed by the PET-MBI are shown for the participants in Table 2.

Data from 126 participants were analyzed by CFA (data were incomplete for two patients). As shown in Fig. 1, the

Table 1. Participant characteristics (N=126)

	N	%
Female	67	53.2%
Age (mean±SD)	79.1±8.9	
< 75 years	38	30.2%
75–84 years	48	38.1%
≥ 85 years	40	31.7%
Primary diagnosis		
Cerebrovascular disease	51	40.5%
Osteoarthritis	47	37.3%
Neuromyopathy	6	4.8%
Disuse syndrome	5	4.0%
Other	17	13.5%
Comorbidity		
Cerebrovascular disease	60	47.6%
Osteoarthritis	67	53.2%
Neuromyopathy	14	11.1%
Disuse syndrome	15	11.9%
Hemiplegia		
Yes	44	34.9%
Mini Mental State Examination (N=125) [†]		
0–8	22	17.6%
9–17	21	16.8%
18–23	37	29.6%
≥ 24	45	36.0%

SD: standard deviation.

[†]Data from one participant who did not complete the MMSE due to aphasia were excluded from the analysis.

model demonstrated a fair fit to the data: χ^2 statistic = 74.9 (df = 35, $p < 0.01$), GFI = 0.88, AGFI = 0.81, RMSEA = 0.096. The path coefficients for the ten items ranged from 0.44 to 0.95. Cronbach's alpha coefficient for the 10-item scale was 0.929.

DISCUSSION

We confirmed satisfactory factorial validity and internal consistency of a Japanese version of the PET-MBI for elderly people living at home in Japan. Factor analysis revealed a single factor as initially hypothesized, and internal consistency was high^{15, 16}, although the participants in this study were not only patients with a specific disease but also elderly individuals in general needing care at home.

It has been suggested that elderly people need the opportunity to accomplish ADL tasks, and in order to maintain independence and minimize dependency levels, they should perform these tasks almost everyday¹⁹. Furthermore, the positive correlation between ADL and QOL is known well²⁰. Although elderly residents in our previous study did not climb stairs in general¹², 34.1% (43/126) of participants in the current study climbed stairs at home with minimal assistance or independently. Concerning factorial validity, the χ^2 statistic, GFI, and AGFI indicated good fit of the model, although the results for RMSEA were sub-optimal. The participants of this study were elderly people

Table 2. Description of grading for each item of the Japanese version of the performance evaluation tool based on the modified Barthel index (PET-MBI) (N=126)

Tasks	Independent		Needs minimal assistance		Needs some assistance		Attempts to do it alone but needs a lot of assistance		Needs full assistance or does not perform/performance not required	
	N	%	N	%	N	%	N	%	N	%
Toilet	71	56.3	22	17.5	13	10.3	6	4.8	14	11.1
Chair/bed transfer	86	68.3	14	11.1	9	7.1	10	7.9	7	5.6
Personal hygiene	76	60.3	15	11.9	14	11.1	9	7.1	12	9.5
Dressing	65	51.6	21	16.7	8	6.3	20	15.9	12	9.5
Ambulation	41	32.5	32	25.4	14	11.1	11	8.7	28 [†]	22.2
Feeding	80	63.5	26	20.6	9	7.1	3	2.4	8	6.3
Bowel control	94	74.6	8	6.3	10	7.9	2	1.6	12	9.5
Bladder control	75	59.5	22	17.5	7	5.6	4	3.2	18	14.3
Self-bathing	33	26.2	12	9.5	41	32.5	27	21.4	13	10.3
Stair climbing	22	17.5	11	8.7	6	4.8	4	3.2	83	65.9

Depending on the grade for each item, scoring was performed based on Shah's MBI.

[†]Grading for ambulation was divided further into five grades in accordance with the wheelchair movement independence level: independent, N=6; needs minimal assistance, N=4; needs some assistance, N=3; attempts to do it alone but needs a lot of assistance, N=2; needs full assistance; and does not perform/performance not required, N=13.

who used the rehabilitation services, so the backgrounds were diverse. In the model evaluation based on such populations, the goodness of fit is likely to be low relative to those derived from homogenous populations, e.g., patients with specific disease or disability. Assuming that our model is applied for these diverse elderly populations, the present result, even though it was suboptimal, is almost acceptable in practical viewpoint. Thus, the results of internal consistency and factor analysis suggest that not a few elderly people needed to climb stairs at home and did so.

Some limitations are worth noting. First, the reliability of ADL assessment may not be generalizable to assessments by other care staff or to self-rated interviews with elderly people, because only OTs and PTs were involved in PET-MBI testing in this study. Further studies involving other healthcare workers are needed to confirm the utility of the PET-MBI. Second, among several ways to confirm the validity, only factorial validity was assessed. We did not verify conceptual validity, since the BI and MBI, items from which items were chosen to indicate the level of nursing care required by a patient⁶, are known to measure functional independence in personal care and mobility. Finally, we collected some basic information about the subjects, such as information about cognitive functions, paralysis, and diagnoses, but we did not collect data regarding the degree of paralysis. Therefore, it is not clear how the degree of paralysis affects the results. However, it is considered that there is no impact on the results.

Use of the PET-MBI has some advantages in real practice. Although the PET-MBI scores as zero both "needs full assistance" and "not required" (e.g., stair climbing), the two cases have different meanings. Therefore, caution is needed when using the PET-MBI in practice, as a healthcare practitioner can readily comprehend an individual's condition based on the description of whether the zero score reflects

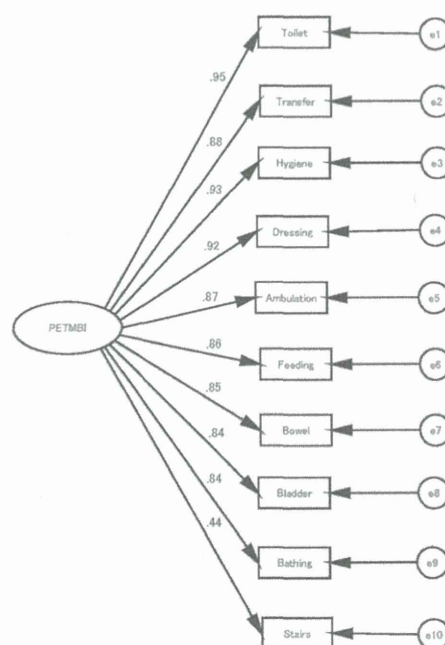


Fig. 1. Confirmatory factor analysis of the PET-MBI χ^2 statistic = 74.9 (df = 35, $p < 0.01$), GFI = 0.88, AGFI = 0.81, and RMSEA = 0.096

"cannot do" or "need not do". Moreover, checkboxes for items pertaining to environment (e.g., availability of handrails) would make it easier for clinical staff to share information and provide consistent care, although this was not examined in this study. Accordingly, the PET-MBI could be used by healthcare practitioners for evaluating the self-care

of elderly people who live at home and need to climb stairs.

In conclusion, the PET-MBI demonstrated satisfactory factorial validity and internal consistency in elderly people living at home. It allows for practitioners in home care services to evaluate and communicate ADL performance of elderly people appropriately because it reports what they actually do in their daily lives.

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Understanding by the General Public of Newspaper Reports on Publicly Reported Cancer Survival in Japan: A Randomized Controlled Trial

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Objective: This study was aimed to examine how well readers of newspapers understand cancer survival rate data, and the effect of this understanding on their behavioral intent.

Methods: We recruited 1950 persons who were 20 years old or older registered with a market research company. Participants were randomly divided into 10 groups; 9 were assigned one of nine newspaper articles, and the remaining group was assigned the excerpt of the official Association of Clinical Cancer Centers web pages. The primary outcome was the proportion of respondents with 'sufficient understanding', who gave 70% or more correct answers on a 10-item knowledge question.

Results: The proportion of participants with sufficient understanding varied across the groups (range: 0.8–22.1%, overall, $P < 0.001$). Only around 15% of participants answered that they would consider other hospitals in a scenario where the only hospital in the participants' area had a 5-year survival of 5% or less, and answers did not significantly vary between groups (range: 11.1–21.0%, overall $P = 0.77$).

Conclusions: The level of understanding of cancer survival rate varied by variation in media reporting. However, the effect of behavioral intent on hospital choice did not differ between articles.

Trial registration: UMIN CTR UMIN000004885.

Key words: quality assurance – health care – oncology service – hospital quality of health care/ statistics and numerical data – communications media

INTRODUCTION

The public reporting of performance data about healthcare quality is expected to improve the quality of care (1). Many developed countries have introduced this system in the last decade (2). Although a large amount of resources have been spent to produce public reports, systematic reviews show that reporting systems have only a moderate impact on consumers' hospital selections (3–6). Ways to maximize the benefit of

public reporting have been explored, but this has not been established yet. A proposed mechanism through which public reporting can improve quality of care is 'the selection pathway' (1). In this pathway, consumers select the better-performing providers, and thus only high-quality providers can survive in the market. For such an effect to occur, however, the information must be accurately understood by the general public (7). Therefore, presentation of public

reporting and education for the general public play an important role (8). Medical news coverage plays an important role in informing the general public, including patients, about performance information. Newspapers are often the first source of publicly reported performance data for the public (9). Health campaigns in the media influence the public perception about health technologies and diseases (10). If the media does not convey adequate information about quality, then readers can misunderstand the performance of facilities, resulting in an unintended consequence of unfairly penalizing facilities (11).

In 2007, the Japanese Association of Clinical Cancer Centers (ACCC) started a public reporting program of 5-year survival of patients treated in each facility, which was the first organized effort for releasing facility-level data on outcomes in Japan (12, 13). In contrast to public reporting programs in Western countries, however, the ACCC officially did not aim to compare survival between facilities. Instead, the ACCC aimed to emphasize the importance of familiarizing and educating the public regarding survival data, as well as to set the standards for data quality to calculate survival. In data processing by the ACCC, they developed data quality standards, and the data of a facility that did not meet the standards were not included in public reporting. For example, the dead/alive status at the 5-year point must be captured for 90% or more of patients, and initial stages must be documented for 60% or more patients. However, survival was not adjusted for case mix because unadjusted results can provide good educational material about variation in case mix in observed survival rates. The ACCC explain on their website about data quality standards and case mix in detail. Further, to emphasize the incomparability of survival data, the ACCC's official website prepared a separate page for each facility that presented the data along with an explanation of the patient and facility characteristics, so that people cannot simply compare performance data across facilities (13). There are not any tables that list survival data of facilities on the website.

Although the public reporting of survival by the ACCC gained extensive coverage by newspapers, the depth of explanation varied across newspaper companies (14). Some newspapers even created a table on their own that compared survival rates from the information posted on the website separately for respective facilities. A concern was that these reporting attitudes may have hampered the intent of the ACCC to educate the public regarding survival data. This study aimed to test this concern by examining how well readers of newspapers understand the limitations of cancer survival rate and the effect of understanding on their behavioral intent, and to describe differences across newspaper articles.

PATIENTS AND METHODS

We conducted a parallel-10-group randomized controlled trial in January 2011. Participants were randomly assigned to newspaper articles that reported a cancer survival public

reporting program and the official website for the program. The study protocol was approved by the ethics committee at Kyoto University Graduate School of Medicine.

SETTING AND PARTICIPANTS

We recruited persons 20 years old or older from panels of the general population that consisted of >1 000 000 members registered with a market research company called Intage Inc. (<http://www.intage.co.jp/english/>). Figure 1 shows the flow of the recruitment of participants. According to the general survey process of the company, the company first sent the screening questions to identify the potential participants. During the process, we excluded persons who were healthcare professionals, or who had or planned to have treatment for cancer, or who had already seen the web page or articles about the ACCC's survival reporting program. We then sent an invitation e-mail to the potential participants. The consenting participants were provided with the link to the web page to the questionnaire. Participants who completed the survey were given coupons that were worth several hundred yen (~2 US\$). Participants who did not complete the survey after they accessed the web page were considered as drop-outs.

INTERVENTION

The participants were presented with one of the newspaper articles that reported the ACCC public reports of survival. To comprehensively identify the newspaper articles, we searched a newspaper article database that five major newspaper companies managed between October 2007 and October 2010. Our search yielded 13 articles, including four commentaries on other original articles. Five articles reported on the release of reports of survival in 2007, while eight articles reported on the release in 2008. Because newspapers often first present a short article to introduce the news and later issue a commentary or detailed explanation under a separate cover, we presented these combinations by the same newspaper. This process yielded nine article sets for use in this study. Table 1 shows the characteristics of each article. We evaluated these newspapers for coverage of 10 important points to understand cancer survival rate, which are described in Supplementary data, Table S1 (14). We also created an excerpt from the official web pages of the ACCC for presentation to one group.

RANDOMIZATION

Persons who agreed to participate in our study were randomly assigned to one of the newspaper articles or an excerpt from the web pages. We used a central computerized random-allocation system. Participants were not informed about the newspaper company or how many articles existed. We asked the participants to read the article, and then answer questions about the cancer survival rate and hospital selection. The participants were allowed to look at the article while answering the questions.