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PATIENTS' LEVEL OF MEDICAL TERM RECOGNITION AS ESTIMATED BY HEALTHCARE WORKERS

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ABSTRACT

To render risk communication between patients and healthcare workers more effective, gaps in the patients' level of medical term recognition as estimated by healthcare workers was examined. This was a cross-sectional study conducted via an Internet survey. A total of 244 nurses and 211 medical doctors were surveyed. We examined 90 medical terms, including 57 medical terms examined by the National Institute for Japanese Language and 33 newly added medical terms. Differences between medical doctors and nurses with respect to the estimation of patients' level of medical term recognition were assessed. The level of medical term recognition by patients was higher when estimated by nurses than when estimated by medical doctors. As members of team care, nurses must consider that patients find technical medical terms to be more difficult than anticipated and that patients are aware of these terms only to a certain extent while receiving healthcare information, such as drug information. Currently, nurses are expected to perform activities as clinical research coordinators and also are requested to work as home-visiting nurses. Therefore they also need ensure that patients understand the medical information provided to them.

Key Words: Risk communication, Perception gap, Shared decision-making, healthcare, Regulatory science

INTRODUCTION

In the medical field of Japan, the concept of a second opinion is of vital importance when patients participate in their own treatment; therefore, this activity has been covered by the universal health insurance of Japan since 2006. On the other hand, recently, many cutting-edge drugs have brought remarkable benefits to patients; however, they have occasionally also caused severe adverse effects. Risk communication about healthcare issues, particularly drug information and related themes, has been gathering increasing importance among patients and healthcare workers, because under such circumstances, perception gaps in pharmaceutical terms and related issues between patients and medical practitioners have been closing up, which is one of the obstacles to ensuring the appropriate participation of patients in their own medical treatment.

With regard to assessment of medical care, medical terms were checked to confirm their specific meaning in the healthcare field;[1] moreover, the use of medical terms in clinical encounters was surveyed,[2] considering that the concept of shared decision-making has been considered in

the medical care field.[3] It is suggested that the language used in the medical care field is often confusing and misunderstood by the families receiving care.[4] Furthermore, resident physicians reportedly overestimate the literacy abilities of their patients.[5] A substantial proportion of the lay people do not understand the phrases often used in cancer consultations.[6] Also, the emphasis on appropriate medication counseling should not be limited to medications that are available only by prescription in the USA.[7] Conversely, in Australia, general practitioners, community pharmacists, and hospital pharmacists are ambivalent about supplying written medicine information to their patients and are concerned about its impact on the patient–provider relationship.[8] From the patients' viewpoint, their experiences during ward rounds and their ability to participate in their own care were also investigated.[9] Although in Japan the National Institute for Japanese Language has examined the underlying recognition of medical terms by people in Japan, as well as investigated gaps in this recognition between the general population and medical doctors,[10] few studies have checked gaps in the perception of terms pertaining to adverse effects and clinical trials between lay people and medical doctors. We believe that recent clinical trials have been vigorously and rigorously conducted worldwide, including in China and other Asian countries.[11,12] Therefore, we previously conducted a study to clarify differences in the basic recognition of technical medical terms, including clinical trial terms, adverse effect terms, and terms examined by the National Institute for Japanese Language, between lay people and medical doctors.[13] However, at that time, nurses were not surveyed. We also performed a study on differences in patients' level of medical term recognition as estimated by medical doctors and pharmacists[14] because of the introduction of the 6-year school period system for graduation from the Faculty of Pharmaceutical Sciences in Japan since 2006. In addition, nurses are currently expected to perform activities as clinical research coordinators (CRCs) in medical institutes[15] and, in particular, at the Independent Administrative National Hospital Organization of Japan and other Japanese university hospitals.[16] They are also required to work at nursing stations in Japan.[17]

This study aimed to examine differences between patients' level of medical term recognition as estimated by medical doctors and that estimated by nurses using an Internet survey. In addition, the incorporated administrative agency Pharmaceuticals and Medical Devices Agency (PMDA) has three primary responsibilities, which include review of new drug applications, determination of the safety of pharmaceutical products, and identification of countermeasures for adverse events.[18] Because the role of the PMDA has been increasing dramatically, its recognition by medical doctors and nurses was also examined in this study.

MATERIALS AND METHODS

The study protocol was approved on March 27 2012 by the Ethics Committee of the Graduate School of Medicine, Nagoya University (approval number: 2011-0048), before data collection. Demographic data of nurses, such as their age, sex, location and scale of the work place, and experience of participation in clinical trials, were collected in this study. Data for medical doctors, such as their age, sex, medical department, scale of the institutional affiliation, number of patients examined per day, and experience of participation in clinical trials, were collected in our previous study.[13]

We previously assessed perception gaps regarding pharmaceutical terms and related issues between lay people and medical doctors.[13] Nurses were examined as the subjects in the current study. The research was performed under contract with NTT Rezonanto Co., Ltd. using an Internet survey that was monitored by the Goo Research contractors. A two-step selection method was used to select medical doctors and nurses. The respondents who answered that they were

medical doctors were directed to subsequent precise questions.[13] Nurses were also recruited using this two-step selection method.

This research was conducted in line with the rules of NTT Rezonanto Co., Ltd. Samples representing 110% of the target number were collected and submitted to us after the removal of imperfect samples. Two hundred and eleven medical doctors and 244 nurses were selected. The research period for medical doctors was February 9 to 11, 2011.[13] The research period for nurses was January 29 to February 11, 2013.

To examine differences between medical doctors and nurses in terms of the estimation of patients' level of medical term recognition, 90 medical care terms were examined, including 57 medical care terms from the National Institute for Japanese Language[10] and an additional 33 medical care terms.[13]

The medical terms of the National Institute for Japanese Language were classified into three groups, from A to C. Group A included 13 medical terms "expressed in other words of vernacular speech," such as ileus, evidence, and remission. Group B included terms that were "explained definitely" and was subdivided into three groups: group B1, 15 medical terms that "had to be explained for the correct meaning to patients," such as insulin, virus, and inflammation; group B2, 17 medical terms that patients "understood roughly but required more explanation for a reliable meaning", such as a malignant tumor, congestion, and depression; and group B3, three medical terms that patients "understood well, but had meanings that were slightly different when used in hospital and when used in vernacular speech; therefore, avoiding confusion is important." The three terms in group B3 were complications, shock, and anemia. Group C also comprised three subgroups. The first subgroup included four medical care terms—informed consent, second opinion, guidelines, and clinical pass—required to explain important and new concepts. The second subgroup included three medical care terms—QOL, palliative care, and primary care—required to describe a new concept regarding medical care and value of everyday life. The third subgroup included two medical care terms— MRI and PET—for new medical instruments to verify if lay people were aware that they were receiving appropriate medical care. In total, nine medical care terms were listed in group C. In this study, we combined all three subgroups of group C because they could all be categorized as terms required to explain important and new concepts.

Furthermore, we targeted seven medical care terms that are used as clinical trial-related terms, such as clinical investigation, GCP, and phase one clinical trial in group D. In addition, 26 medical care terms related to adverse effects, such as anaphylaxis, Stevens–Johnson syndrome, and toxic necrolysis, were selected for group E. In total, 90 medical terms were adopted as the target terms. Awareness of the PMDA by medical doctors and nurses was also examined.

Medical doctors and nurses chose answers calibrated on a scale of 1–5, where 1 indicated "I do not think that the patient knows," 3 indicated "I cannot tell clearly whether the patient knows or not," and 5 indicated "I think that the patient knows." This recognition was termed "patients' level of medical term recognition as estimated by medical doctors and nurses." In the analyses, answers 4 and 5 indicated "I think that the patient knows." With regard to awareness about the PMDA, medical doctors and nurses chose answers calibrated on a scale of 1–3, where 1 indicated "I do not know the PMDA," 2 indicated "I have heard about the PMDA," and 3 indicated "I know the PMDA". This recognition was termed "recognition level of the PMDA by medical doctors and nurses".

The chi-squared test was used to analyze differences between patients' level of medical term recognition estimated by medical doctors and that estimated by nurses and differences in the level of recognition of the PMDA between medical doctors and nurses.

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RESULTS

Demographics

Table 1 shows the demographics of the survey respondents. In the present study, we obtained responses from 244 nurses (22 men and 222 women). With regard to medical doctors, we used data from our previous study,[13] in which responses were obtained from 211 medical doctors (194 men and 17 women). A statistically significant gender difference was observed in the age of medical doctors. The majority of male medical doctors (43.3%) were aged 40–49 years, whereas the majority of female doctors (58.8%) were aged 30–39 years. Meanwhile, statistically significant gender differences were observed among nurses in the experience of participation in clinical trials as CRCs.

Table 1 Demographics of the respondents

		Medical doctors					Nurses		
		sex					Sex		
		Male	Female	test			Male	Female	
		(n=194)	(n=17)				(n=22)	(n=222)	
Age	20~29	5 (2.6%)	2 (11.8%)	**	Age	20~29	1 (4.5%)	33 (14.9%)	
	30~39	39 (20.1%)	10 (58.8%)			30~39	10 (45.5%)	96 (43.2%)	
	40~49	84 (43.3%)	4 (23.5%)			40~49	5 (22.7%)	67 (30.2%)	n.s.
	50~59	56 (28.9%)	1 (5.9%)			50~59	5 (22.7%)	23 (10.4%)	
	60~69	3 (1.5%)	0 (0.0%)			60~69	1 (4.5%)	3 (1.4%)	
	70 or more	7 (3.6%)	0 (0.0%)						
Institute	clinic (no beds)	60 (30.9%)	4 (23.5%)	n.s.	Institute	clinic (no beds)	3 (13.6%)	44 (19.8%)	
	clinic (1~19 beds)	12 (6.2%)	0 (0.0%)			clinic (1~19 beds)	0 (0.0%)	8 (3.6%)	
	Hospital (20~99 beds)	15 (7.7%)	0 (0.0%)			Hospital (20~99 beds)	1 (4.5%)	15 (6.8%)	n.s
	Hospital (100~199 beds)	32 (16.5%)	3 (17.6%)			Hospital (100~199 beds)	3 (13.6%)	22 (9.9%)	
	Hospital (200 beds or more)	75 (38.7%)	10 (58.8%)			Hospital (200 beds or more)	13 (59.1%)	96 (43.2%)	
						home-visit nursing station	1 (4.5%)	10 (4.5%)	
						The others	1 (4.5%)	27 (12.2%)	
Department	Internal medicine	83 (42.8%)	9 (52.9%)	n.s.					
	Surgery	78 (40.2%)	6 (35.3%)		Participation in clinical trials as clinical research coordinator (CRC)	At present	2 (9.1%)	4 (1.8%)	
	The others	33 (17.0%)	2 (11.8%)			Used be	4 (18.2%)	19 (8.6%)	*
No of outpatients / day	9 or less	23 (11.9%)	3 (17.6%)	n.s.		No	16 (72.7%)	199 (89.6%)	
	10~19 person	33 (17.0%)	4 (23.5%)						
	20~29 person	37 (19.0%)	3 (17.6%)						
	30~39 person	19 (9.8%)	4 (23.5%)						
	40 person or more	82 (42.3%)	3 (17.6%)						
Participation in clinical trials	Yes	116 (59.8%)	11 (64.7%)	n.s					
	No	78 (40.2%)	6 (35.3%)						

χ^2 test. **; $p < 0.01$, *; $p < 0.05$, n.s.; not significant. a : multiple answers were welcomed.

Differences between medical doctors and nurses with regard to estimation of patients' level of recognition of the 90 medical terms

Table 2 shows the differences between medical doctors and nurses with regard to estimation of patients' level of recognition of the 90 medical terms. The level of recognition of all 13 terms in group A was significantly higher when estimated by nurses than when estimated by doctors.

Although the level of recognition of all 15 terms in group B1 was higher when estimated by nurses than when estimated by doctors, a significant difference was observed only for 10 of the 15 terms. The level of recognition of 16 of the 17 terms in group B2 was higher when estimated by nurses than when estimated by doctors, with a significant difference observed for 11 of the 16 terms. The level of recognition of all three terms in group B3 was significantly higher when estimated by nurses than when estimated by doctors. The level of recognition of all nine terms in group C was higher when estimated by nurses than when estimated by doctors, with a significant difference observed for eight of the nine terms. Among the seven medical terms in group D, the level of recognition of three was higher when estimated by nurses than when estimated by doctors, with a significant difference observed for two of the three terms. Conversely, the level of recognition of the remaining four medical terms in this group was higher when estimated by medical doctors than when estimated by nurses, with a significant difference for two of these four terms. Among all 26 medical terms in group E, the level of recognition of 23 was higher when estimated by nurses than when estimated by doctors, with a significant difference observed for 16 of these 23 terms.

Table 2 Differences between medical doctors and nurses with regard to estimation of patients' level of recognition of the 90 medical terms

Group	Medical term	Estimated by the medical doctors (n=211) Know [a] (%)	Estimated by the nurses. (n=244) Know [a] (%)	test
	Critical condition	65.9	80.3	**
	Prognosis	54.5	84.4	**
	Tolerance	49.3	63.1	**
	Aspiration	45.5	68.9	**
	MRSA	44.1	67.2	**
	Biopsy	37.9	66.0	**
A	Infiltration	33.2	60.2	**
	Evidence	30.3	43.0	**
	Remission	30.3	48.8	**
	Deliria	30.3	59.4	**
	Ileus	29.4	59.4	**
	ADL	28.9	61.9	**
	COPD	24.6	55.7	**
	Virus	78.2	86.9	*
	Metabolic syndrome	74.9	81.1	n.s.
	Tumor	71.1	80.7	*
	Insulin	70.6	83.6	**
	Ulcer	68.7	77.5	*
	Inflammation	66.4	88.1	**
	Be taken as needed	62.1	69.3	n.s.
B1	Renal insufficiency	59.2	64.8	n.s.
	Geriatric health services facilities	55.0	61.1	n.s.
	Steroid	52.1	65.2	**
	Tumor marker	46.9	52.5	n.s.
	Group home	44.1	57.8	**
	Symptomatic treatment	42.7	53.3	*
	Sepsis	35.5	49.2	**
	Connective tissue disease	33.2	51.6	**

	Diabetes	85.3	87.7	n.s.
	Adverse drug effect	82.5	86.5	n.s.
	Malignant tumor	81.5	85.7	n.s.
	Asthma	80.6	86.5	n.s.
	Arteriosclerosis	80.1	76.6	n.s.
	Depression	75.8	79.1	n.s.
	Heat stroke	72.0	85.2	**
	Polyp	60.7	73.4	**
B2	Brain death	59.7	70.9	*
	Cirrhosis	58.8	68.9	*
	Death with dignity	51.2	61.5	*
	Chemotherapy	48.3	67.2	**
	Jaundice	47.9	65.6	**
	Anamnesis	42.7	69.7	**
	Antibody	40.8	57.0	**
	Clinical trial	34.6	47.5	**
	Congestion	32.2	51.2	**
	Anemia	72.5	85.7	**
B3	Complication	65.4	77.9	**
	Shock	43.6	60.7	**
	MRI	51.7	61.5	*
	Informed consent	44.5	56.6	*
	Second opinion	44.1	59.4	**
	Palliative care	35.1	50.4	**
C	Guidelines	34.6	46.7	*
	PET	32.7	40.2	n.s.
	QOL	28.9	44.7	**
	Primary care	25.1	40.6	**
	Clinical pass	20.4	36.9	**
	Clinical investigation	29.9	42.2	**
	Placebo	25.6	38.9	**
	Double blind trial	22.7	12.3	**
D	Phase three clinical trial	15.2	7.4	*
	Phase one clinical trial	14.7	13.1	n.s.
	Phase two clinical trial	13.3	8.2	n.s.
	GCP	8.5	10.7	n.s.
	Anuresis/Difficulty of urination	38.9	50.8	*
	Bleeding tendency	37.9	54.9	**
	Hypothyroidism	33.6	39.3	n.s.
	Thrombosis	32.2	42.6	*
	Medicamentosus stomatitis	28.4	39.3	*
	Anaphylaxis	26.1	46.7	**
	Peripheral neuropathy	24.2	38.5	**
E	Nephrotic syndrome	24.2	36.5	**
	Aplastic anemia	21.8	40.6	**
	Ataxia	20.9	32.4	**
	Edema of lung	20.4	40.2	**
	Interstitial pneumonia	19.9	38.9	n.s.
	Rhabdomyolysis	19.9	21.3	n.s.
	Ventricular tachycardia	19.9	34.0	**
	Stevens-Johnson syndrome	19.4	16.4	n.s.

Agranulocytosis	19.4	22.5	n.s.
Guillain-Barre syndrome	19.4	32.4	**
Angioedema	19.0	27.5	*
Drug-related parkinsonism	18.5	24.2	n.s.
Malignant syndrome	17.5	31.6	**
Alveolar hemorrhage	17.1	22.5	n.s.
Pseudohyperaldosteronism	16.1	16.0	n.s.
Dyskinesia	16.1	22.5	n.s.
Toxic necrolysis	15.6	11.9	n.s.
Akathisia	12.3	19.7	*
Hand-and-feet syndrome	11.8	19.3	*

a: 1 means "I do not think that patients know". 3 means "I cannot tell clearly whether the patient knows or not", 5 means "I think that patients know." In analyzing, 4 and 5 out of 1 to 5 were used as "I think that patients know"
χ^2 test. **; $p < 0.01$, *; $p < 0.05$, n.s.; not significant.

Differences between nurses with and without experience of participation in clinical trials with regard to estimation of patients' level of recognition of the 90 medical terms

Patients' level of recognition of 72 of the 90 medical terms was higher when estimated by nurses with experience of participation in clinical trials than when estimated by those without. Furthermore, as shown in Table 3, a significant difference was found for 13 out of these 72 terms. Ten medical terms for which a significant different was observed included five in group D (clinical trial-related terms) and eight in group E (medical care terms related to adverse effects). The level of recognition of the remaining 18 medical terms was higher when estimated by nurses without experience of participation in clinical trials, with no significant differences observed for all 18 terms.

Table 3 Differences between nurses with and without experience in clinical trials with regard to estimation of patients' level of recognition of 90 medical terms

		Estimated by the nurses a(%)		
		Experience of clinical trials		
Group	Medical term	Yes (n=29)	No (n=215)	test
		Know	Know	
D	GCP	31.0%	7.9%	**
D	Phase one clinical trial	37.9%	9.8%	**
D	Phase two clinical trial	31.0%	5.1%	**
D	Phase three clinical trial	31.0%	4.2%	**
D	Double blind trial	37.9%	8.8%	**
E	Toxic necrolysis	27.6%	9.8%	*
E	Drug-related parkinsonism	41.4%	21.9%	*
E	Agranulocytosis	41.4%	20.0%	*
E	Alveolar hemorrhage	44.8%	19.5%	**
E	Edema of lung	62.1%	37.2%	*
E	Ataxia	55.2%	29.3%	**
E	Pseudohyperaldosteronism	37.9%	13.0%	**
E	Hand-and-feet syndrome	34.5%	17.2%	*

a: 1 means "I do not think that patients know". 3 means "I cannot tell clearly whether the patient knows or not", 5 means "I think that patients know." In analyzing, 4 and 5 out of 1 to 5 were used as "I think that patients know"
χ^2 test. **; $p < 0.01$, *; $p < 0.05$, n.s.; not significant.

Differences in the level of recognition of the PMDA between medical doctors and nurses

The level of recognition of the PMDA was significantly different between medical doctors (27.5%) and nurses (8.6%). With regard to demographics, there was a significant difference in the level of recognition of the PMDA between male (22.7%) and female nurses (7.2%; χ^2 test: $p < 0.05$) and between nurses with experience of participation in clinical trials (41.4%) and those without (4.2%; χ^2 test: $p < 0.01$). Conversely, there were no differences among medical doctors in terms of demographics.

DISCUSSION

This study was conducted using Internet surveys, which provide answers within a relatively short period by obtaining responses from monitors contracted by the Internet research company beforehand. Recently, Internet surveys have become popular in Japan.[19] In contrast, face-to-face interview methods have the advantage of providing more detailed information on the level of medical term recognition. We believe that this is one of the limitations of this study.

Our previous study showed that the level of recognition of the 90 medical terms was the highest for the eldest patient group.[13] We suggest that elderly patients who can respond to the Internet survey are highly literate in terms of healthcare-related issues as well as computer-relevant issues. Because this trend applies to medical doctors and nurses as well as patients, we believe that this should also be considered in the present study, which was performed using Internet surveys.

Our previous study showed the presence of large differences between a lay person's level of medical term recognition and a patient's level of recognition as estimated by medical doctors; this was particularly true for more complex terms.[13]

This study showed that patients' level of recognition of medical terms in groups A, B, C, and E was higher when estimated by nurses than when estimated by medical doctors. Among all seven medical terms in group D, patients' level of recognition of three medical terms was higher when estimated by nurses than when estimated by doctors, with a significant difference observed for two of these three terms. Conversely, patients' level of recognition of the remaining four terms was higher when estimated by medical doctors than when estimated by nurses, with a significant difference for two of these four terms. Similarly, patients' level of recognition of medical terms was higher when estimated by pharmacists than when estimated by medical doctors. Because the delivery of drug information is very important for pharmacists, based on Item 2 of Article 25 of the Pharmacist Law,[20] pharmacists should consider that patients' recognition level is lower than that estimated by them. Moreover, we believe that nurses are currently highly requested to have more rigorous communications with patients, particularly under the national trend of in-home care promoted by the Central Government of Japan.

Patients' level of medical term recognition was higher when estimated by nurses with previous participation in clinical trials than when estimated by nurses without any previous participation. We believe that the former group of nurses have so many opportunities to hear or see the clinical trial-related terms and adverse effect terms via clinical trial activities[16] that they overestimated patients' level of recognition of these terms. We also believe that they met a patient who participated in the clinical trial after giving his or her informed consent to the medical doctor who performed the clinical trial. Therefore, the patients' level of medical term recognition may have been higher when estimated by nurses with experience of participation in clinical trials.

In contrast, our previous study showed that patients' level of medical term recognition was lower when estimated by medical doctors with experience of participation in clinical trials

than when estimated by medical doctors without experience of participation in clinical trials.[13] Therefore, we suggested that clinical trials were a good activity for medical doctors to identify patients' level of medical term recognition in greater detail as well as to engage in the development of approval for cutting-edge drugs for patients.

We believe that the recognition gaps observed between patients and nurses should be taught explicitly to nurses during their training.

Finally, this study showed that the level of recognition of the PMDA by nurses (8.6%) was significantly lower than that by medical doctors (27.0%) and pharmacists (65.1%). The main roles of the PMDA are to review new drug applications, provide countermeasures for the safety of pharmaceutical products, and provide pharmaceutical products adverse effect damage relief.[18] Therefore, nurses need to be aware of the existence of the PMDA because, if necessary, they also deliver information regarding the role of the PMDA to patients from the perspective of relief from the adverse effects of drugs. In conclusion, as members of team care, nurses must consider that patients find technical medical terms to be more difficult than anticipated and that patients are aware of these terms only to a certain extent while receiving healthcare information, such as drug information. Currently, nurses are expected to perform activities as CRCs and are also required to work as home-visiting nurses. Therefore, they need to ensure that patients understand the medical information provided to them.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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