

Discrepancies between patients' and pharmacists' perceptions of the role of community pharmacists as advisors on the use of pharmaceuticals in Japan: A comparison prior to and following revision of the Pharmacists' Act

SAGE Open Medicine

Volume 7: 1–9



© The Author(s) 2019

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/2050312119838746

journals.sagepub.com/home/smo

Shinji Oshima¹, Mari Yamagishi¹, Mitsuyoshi Okita², Hayato Akimoto¹, Akio Negishi¹, Norimitsu Horii^{2,3}, Mizue Mutoh³, Yasuko Sannomaru⁴, Sachihiko Numajiri³, Naoko Inoue^{2,3}, Shigeru Ohshima^{2,3}, Masahiro Wada⁴ and Daisuke Kobayashi^{1,2}

Abstract

Objectives: In 2014, immediately prior to the revision of Article 25-2 of the Pharmacists' Act, we conducted a survey on pharmacists' and patients' perceptions of pharmacists' roles. A role discrepancy between the two was identified. The objective was to examine changes in role perceptions and awareness of pharmacists as medication specialists following revision to the Pharmacists' Act.

Methods: The survey was conducted using an Internet-based questionnaire. A total of 469 patients and 354 pharmacists responded to 12 questions about the perceived roles of pharmacists.

Results: Analysis revealed that the only evaluation that changed as a result of revisions was pharmacists' role as "family or regular pharmacist," with scores dropping by about half. As in 2014, the high rating rate for pharmacists surpassed the high rating of patients for all other items. The greatest discrepancy in role perception was observed for the same three items ("Understanding the effects of the drugs the patients are taking," "Understanding the health changes caused by the drugs dispensed to the patients," and "Consciously protecting patients from the adverse effects of drugs") as 2014.

Conclusion: A major role discrepancy continues to exist between patients and pharmacists, and it is necessary for pharmacists to take on a more advanced role in patient care. Results suggest that pharmacists must monitor changes in patients' lifestyles and provide clear explanations for patients to rate them highly as medication specialists.

Keywords

Role theory, role perception, pharmacist, patient, role discrepancy

Date received: 12 October 2018; accepted: 28 February 2019

¹Laboratory of Analytical Pharmaceutics and Informatics, Faculty of Pharmacy and Pharmaceutical Sciences, Josai University, Saitama, Japan

²Josai University Pharmacy, Saitama, Japan

³Laboratory of Pharmacy Management, Faculty of Pharmacy and Pharmaceutical Sciences, Josai University, Saitama, Japan

⁴Laboratory of Nutritional Pedagogy, Faculty of Pharmacy and Pharmaceutical Sciences, Josai University, Saitama, Japan

Corresponding author:

Daisuke Kobayashi, Laboratory of Analytical Pharmaceutics and Informatics, Faculty of Pharmacy and Pharmaceutical Sciences, Josai University, 1-1 Keyakidai, Sakado 350-0295, Saitama, Japan.

Email: dkoba@josai.ac.jp



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons

Attribution-NonCommercial 4.0 License (<http://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

Introduction

Medicine in Japan is implemented via universal health insurance, which achieves universal healthcare coverage through benefits for essential medical services and reduction of out-of-pocket expenses for the patient.¹ However, with increases in the older adult population as its most significant long-term challenge, the Japanese government is working to shift the quality of medical care by expanding primary care and home healthcare.^{2,3} Given these circumstances, influenced by revisions in the Pharmacists' Act and the medical care system, the job of pharmacists is changing from merely dispensing medications to providing patient counseling and monitoring.^{4,5}

Article 25-2 of the Pharmacists' Act was revised in June 2014. This revision indicated that pharmacists' obligation was not only to provide dosing information but also to provide guidance based on pharmaceutical knowledge. Guidance based on pharmaceutical knowledge includes confirmation of adherence and assessment of efficacy after handover of drugs and provision of ongoing guidance on avoidance of side effects and drug interactions.⁶ As a result of revision of this law, Miwa,⁷ the Japanese Society of Hospital Pharmacists' legal advisor, stated that the role of pharmacists as advisors about pharmaceutical use has become clearer.

In March 2014, immediately prior to revision of the Pharmacists' Act, we conducted an Internet survey to investigate pharmacist and patient perceptions of the pharmacists' role based on role theory. Using a US report by Worley et al.⁸ as a reference, our previous survey consisted of 4 dimensions and 12 items. For all items, pharmacists rated the pharmacist role higher than patients, demonstrating role discrepancies. The discrepancies in evaluations were greater than those found in the US study. Discrepancies in the perceptions of pharmacists' roles were found to appear between pharmacist and patient responses, especially for understanding a drug's effects on patients ("The pharmacist knows that the drug a patient is taking is effective"), understanding a patient's physical condition ("The pharmacist understands the health changes caused by the drug"), and awareness of the need to protect patients from adverse effects ("The pharmacist is consciously protecting patients from the adverse effects of drugs"). Our Internet survey incorporated two new questions designed to have patients to evaluate pharmacists' identity as a medication specialist in contrast to physicians ("The patient is more likely to ask questions about medications to a pharmacist than his/her doctor," and "The patient thinks that a pharmacist is more of a medication specialist than a doctor"). A partition analysis of our results revealed that respondents who highly rated the pharmacist as a medication specialist also had high regard for pharmacists as being a family or regular pharmacist, awareness of patients' use of over-the-counter (OTC) drugs, making efforts to be approachable to patients.⁹

In June 2014 after this survey was conducted, Article 25-2 of the Pharmacists' Act was revised. In addition to this revision to the law, in April 2016, the Ministry of Health, Labor

and Welfare institutionalized the function of the family/regular pharmacist as a "medical service covered by health insurance," with the aim of strengthening "Bungyo," the separation of dispensing from medical practice.¹⁰ Coordinating with the prescribing physician for an integrated and ongoing understanding of the adherence status of the patient, and the provision of guidance on adherence were made subject to health insurance reimbursement. As a result, pharmacists were subject to increased responsibilities in management of pharmacotherapy in Japanese healthcare.

Numerous researchers in Europe and the United States have investigated, from sociological and/or sociopsychological perspectives, the changes in pharmacists' roles resulting from advancements in medical technologies and subsequent revisions to legal systems.¹¹ Based on sociological role theory, Schommer and Gaither conducted a total of six questionnaire surveys once every 3 years during the 15-year period between 1995 and 2010. Specifically, they investigated how patients and pharmacists viewed the pharmacist's role as an advisor about the use of pharmaceuticals.¹² The researchers reported that throughout the 15-year survey period there were no changes in patient or pharmacist perceptions about pharmacists' role as advisors on pharmaceutical use and noted that pharmacists' evaluation scores on role perception exceeded those of the patients in all survey periods.

Therefore, to investigate changes in perceptions of pharmacists' roles from pharmacist and patient perspectives resulting from revision of the Pharmacists' Act and the system of medical services covered by health insurance, in July 2017, 3 years following revisions to the law, we conducted a study similar to our previous study. We then compared and examined the 2017 findings in light of those obtained in the previous survey questionnaire.

Methods

Survey method

Because this study compared perceptions prior to and following revisions to the law, the post-revision survey method conformed to the pre-revision survey utilized in our previous study.⁹

We implemented the survey using Internet research (Rakuten Research Inc. Company, Shinagawa, Tokyo, Japan). The respondents were recruited by Rakuten Research.

Respondent characteristics and selection

The method used to extract respondents was based on the survey conducted in 2014. This involved the extraction of patients and pharmacists residing in Japan from registered monitors by Rakuten Research. This was followed by a preliminary survey to determine whether it was possible to obtain the number of respondents needed for this study and to collect a distribution of responses that matched the population ratio delineated in the Ministry of Internal Affairs and

Communications' basic resident register population by prefecture (as of 1 January 2017). The necessary sample size was calculated using Raosoft software, which was estimated at the 95% confidence level with a 50% response distribution and a 5% margin of error. As the target population size was unknown, it was set to 20,000.¹³ The final estimated sample size was determined to be 377; the final sample size was taken from a group of 1000 (patients) and 900 (pharmacists) to account for approximately 50% and 45% response rate in previous survey.

Questionnaire

We employed the same questionnaire used in the previous study. In other words, based on role theory, patients and pharmacists responded to the items with the same meaning using a questionnaire designed for both patients and pharmacists (Supplemental Figures S1 and S2). The survey method remained the same, even if "interpersonal perception theory" was employed.^{9,11} The questionnaire consisted of 12 questions, and participants responded using a Likert-type 5-point rating. The 12 questions represented the following four dimensions: (1) "Communicating with the patient" (Q1–Q4), (2) "Understanding the patient" (Q5–Q8), (3) "A family or regular pharmacist" (Q9, Q10), and (4) "A medication specialist" (Q11, Q12). Among the items related to the pharmacist's role communicating with patients, Q4 focused on the same role aspect as Q2, which ask about the pharmacist being understood. However, because it was worded from a reverse perspective, it queried whether the respondent was able to understand the pharmacist. Q4 served as a possible check to confirm the consistency of individual responses toward the role of a pharmacist being understandable. Since Q4 was essentially redundant (i.e. an "inverse" form of Q2), it was excluded from the analysis.^{14,15} Q11 and Q12 asked whether patients perceive pharmacists more as medication specialists than physicians. We hypothesized that the greater the ratio of respondents who gave high points for these questions, the greater was the perception of pharmacists as medication specialists. Thus, they were included in the questionnaire to evaluate perception of the pharmacists' identity.

In addition to Q1 through Q12, patients and pharmacists were, respectively, instructed to respond to the following three items and two items. Three categorizing variables were used with patients: (1) patronage and pharmacy use, (2) frequency/intensity of prescription use, and (3) medical diagnoses or conditions. For pharmacists, responses regarding practice settings and career length were included as categorizing variables.

Questionnaire implementation

Between 27 and 30 June 2017, Rakuten Research conducted a survey of patients registered as monitors for periodic Internet polling (Supplemental Figure S1). Between 27 June

and 7 July 2017, a questionnaire survey was also conducted with a sample of pharmacists from the Rakuten Research polling database (Supplemental Figure S2).

The respondents participated in the survey of their own free will and accord. Moreover, it was explained in advance that the questionnaire contained personal information and "special-care required" personal information. It was also explained that the responses would be handled according to Rakuten Research, Inc.'s "Guidelines on protecting personal information." The participants responded to the questionnaire only if they consented.

This study was approved by Josai University's ethics committee on medical research on human subjects (approval no. 2018-05A).

Analysis of questionnaire results

Comparison and test methods. Respondents' characteristics were examined using the chi-square test. The ratio of responses was determined by dividing the number of respondents for each rating (1–5) for each question by the total number of valid respondents. The total rate of high rating (HR) responses (either "4" or "5") was defined as the "high rating" rate.⁹ Previous studies have used HR as a parameter for intergroup comparisons.^{16,17}

Cronbach's alpha. We calculated Cronbach's alpha coefficient and confirmed the survey's internal consistency among each item. If the alpha coefficient was 0.8 or higher, the item was regarded as having internal consistency.

Factor analysis. Based on the findings regarding "the conceptual structure of the roles of pharmacists" in the previous study, we tested the goodness of fit of the confirmatory factor analysis model in which only one possible common factor was expected to contribute to the questionnaire results. The R package Latent Variable Analysis (lavaan) was used for the confirmatory factor analysis.

Partition analysis. For Q11 and Q12 (measuring pharmacist identity), we defined the survey response results of "4" and "5" (HR) as "1," and re-defined the response results of "1" through "3" as "0," making them the objective variables. The responses for Q1 to Q10 (on a scale from "1" to "5"), excluding dummy question Q4, were defined as the explanatory variables. Partition analysis was then conducted to identify the factors that were specific to the group of patients who evaluated pharmacists highly as pharmaceutical experts (i.e. those who scored Q11 and Q12 highly). To prevent the analysis results from becoming too complex, branching was applied to a maximum of three sub-populations.

Statistical analysis. Partition analysis was conducted using JMP 5.1.2 (SAS Institute Japan, Tokyo, Japan) for Windows. The R Project for Statistical Computing software package (R

Expressions included in survey items for patients and pharmacists	
Q1	The pharmacist makes it easy for the patients to talk to him/her.
Q2	The pharmacist talks by choosing his/her words carefully so that are easily understood.
Q3	The pharmacist understands complaints and responds appropriately.
Q5	The patient thinks that his/her pharmacist knows things about his/her lifestyle habits.
Q6	The pharmacist knows that the patient takes OTC medications and other items.
Q7	The pharmacist knows that the drug a patient is taking is effective.
Q8	The pharmacist understands the health changes caused by the drug.
Q9	The pharmacist is consciously protecting patients from the adverse effects of drugs.
Q10	The patient regards his/her pharmacist as his/her family or regular pharmacist.
Q11	The patient is more likely to ask questions about medications to a pharmacist than his/her doctor.
Q12	The patient thinks that a pharmacist is more of a medication specialist than a doctor.

Figure 1. Comprehensive representation of questions for both patient and pharmacist surveys.

version 3.4.1, R Foundation for Statistical Computing, Vienna, Austria)¹⁸ was used for all other analyses.

Results

In this section, question numbers for Q1 to Q12 will be presented as abbreviations for brevity and clarity. Figure 1 can be consulted to cross-check question number and associated content. However, in the discussion, both question number and content will be provided for necessary context.

Respondent attributes

The target number of 1000 patient questionnaires and 900 pharmacist questionnaires was collected. During inspection of questionnaire responses, questionnaires with the same response selected for Q1 through Q12 were defined as insincere responses and excluded from analysis.¹⁹ Data were extracted from patient questionnaire response results according to the flow shown in Supplemental Figure S3(a). Only respondents who regularly visit community pharmacies were the target of this study, and respondents, who irregularly submit prescriptions (for colds and other acute diseases) and insincere respondents, were excluded from analysis. In addition, as shown in Supplemental Figure S3(b), only the response results from pharmacists who work at community pharmacies were analyzed, and pharmacists not working at community pharmacies and insincere respondents were excluded from analysis.

By data cleaning, a total of 469 patients and 354 pharmacists met the inclusion criteria. The effective response rates for patients and pharmacists were 46.9% and 39.3%, respectively. The number of patients included in the study decreased primarily because many utilized community pharmacies irregularly (Supplemental Figure S3(a)). For pharmacists, the sample size decreased primarily because the respondents did not currently work at community pharmacies (Supplemental

Figure S3(b)). Patients and pharmacists who responded to the questionnaire lived in all 47 prefectures throughout Japan, demonstrating the general population distribution throughout the country. Table 1 shows respondent attributes in the current and previous surveys. The only significant result was from different distributions of pharmacists responding in the age categories for 2014 and 2017, with slightly higher proportions of respondents in older age categories in 2017. Cronbach's alpha for patients and pharmacists in the previous questionnaire study were 0.88 and 0.85, respectively. In the current survey, Cronbach's alpha coefficients in the patient and pharmacist questionnaire were 0.88 and 0.85, respectively, indicating internal consistency.

Item analysis

Descriptive statistics for each item are shown in Table 2. No ceiling or floor effects were detected in any item.

Comparison of patient and pharmacist HR rate

Table 3 shows the changes in the rate of HR after the revision of the Pharmacists' Act. All HRs from the current questionnaire results of patients and pharmacists corresponded extremely well with the values obtained in the previous survey. The only exception was the HR of pharmacists for Q10, which was halved from 41.4% in 2014 to 20.9% in 2017.

In the 2017 results, Q7, Q8, and Q9 produced wide differences in scores between pharmacists and patients. In the previous survey, there were wide differences in the scores for these three items between the two groups. The results of the current survey demonstrated the same pattern, indicating the persistence of significant role discrepancies.

Factor analysis. Figure 2 shows the conceptual model of the roles of pharmacists based on the results from the previous study.⁹ The following are the goodness-of-fit indices for

Table 1. Patient and pharmacist characteristics.

Attribute	2017	2014 ^a
	n=469	n=529
<i>Patient</i>		
Gender (n, %)		
Male	258 (55.0%)	302 (57.1%)
Female	211 (45.0%)	227 (42.9%)
Chi-square, <i>p</i> -value=0.51		
Age (years) (n, %)		
≤39	60 (12.8%)	49 (9.3%)
40–64	315 (67.2%)	386 (73.0%)
≥65	94 (20.0%)	94 (17.8%)
Chi-square, <i>p</i> -value=0.09		
Duration of drug use (years) (n, %)		
<1	46 (9.8%)	55 (10.4%)
1–5	180 (38.8%)	200 (37.8%)
≥6	243 (51.8%)	274 (51.8%)
Chi-square, <i>p</i> -value=0.95		
Number of disease (n, %)		
1	280 (59.7%)	306 (57.8%)
≥2	189 (40.3%)	223 (42.2%)
Chi-square, <i>p</i> -value=0.55		
Attribute	2017	2014 ^a
	n=354	n=338
<i>Pharmacist</i>		
Gender (n, %)		
Male	184 (52.0%)	174 (51.5%)
Female	170 (48.0%)	164 (48.5%)
Chi-square, <i>p</i> -value=0.90		
Age (years) (n, %)		
20s	39 (11.0%)	22 (6.5%)
30s	108 (30.5%)	135 (39.9%)
40s	111 (31.4%)	104 (30.8%)
50s	73 (20.6%)	60 (17.8%)
60s	23 (6.5%)	17 (5.0%)
Chi-square, <i>p</i> -value=0.04		
Career (years) (n, %)		
<3	33 (9.3%)	26 (7.7%)
≥3	321 (90.7%)	312 (92.3%)
Chi-square, <i>p</i> -value=0.44		

^a2014 research data are cited from Oshima et al.⁹

confirmatory factor analysis of the conceptual structure in the previous study for patients (comparative fit index (CFI)=0.990, root mean square error of approximation (RMSEA)=0.089, and standardized root mean square residual (SRMR)=0.039) and pharmacist (CFI=0.972, RMSEA=0.123, and SRMR=0.053). Generally, CFI ≥ 0.95 and RMSEA ≤ 0.06 indicate a high goodness of fit, while RMSEA ≥ 0.10 indicates a poor goodness of fit. In addition, SRMR ≤ 0.08 indicates a high goodness of fit.²⁰ The goodness of fit of the conceptual

model of the roles of pharmacists in the questionnaire results in this study was not high enough. However, each index demonstrated an appropriate goodness of fit within a tolerable range.

Identification of factors related to “medication specialists” by partition analysis

The 2017 results in Table 4 show that, in patients with an HR on Q11 and ≥4 on Q10, the percent with HR increased from 23.5% to 42.3%. Furthermore, if patients also had rated Q2 with a 5, the HR rate of 58.7%, and if there was a rating of 5 on Q5, the HR rate rose to 60%. In addition, for those with an HR on Q12 and ≥4 on Q3 in 2017, the percent with HR increased from 33.9% to 48.9%. If they also had ≥4 on Q10, the HR rate of 57.7%, and rated Q6 with a 5, the HR rate rose to 75.9%. The number of respondents decreased at each step, but the specific responses were associated with higher proportional HR rates.

Discussion

The current survey was implemented not only after the revision of Article 25-2 of the Pharmacists’ Act, but also after the family pharmacist system was newly adopted. The revisions to the Pharmacists’ Act and the introduction of the family pharmacist system were not found to affect the conceptual structure of the roles of pharmacists. The only HR that had changed (as represented in Table 3) was Q10 (“The patient regards his/her pharmacist as his/her family or regular pharmacist”). This was likely influenced by the recent revision to the law, leading pharmacists to feel as though they have not been able to meet the roles expected of them. That is, they have not been able to fully perform their roles, which may be the reason for the observed decline in the pharmacists’ self-evaluations.

The Ministry of Health, Labour and Welfare cites the following as the functions they expect of a family or regular pharmacist: provision of services at home and 24h a day; unified understanding of medication information, such as continuously keeping track of any adverse drug reactions or effectiveness; and collaboration with medical institutions, such as providing feedback to physicians on adverse reactions and medication status.¹⁰ However, these functions set a high bar for what is currently required of family or regular pharmacists, which is generally attributed to the difficulty of their implementation.²¹ This is inferred from the fact that “family or regular pharmacist guidance fee,” an item reimbursed to community pharmacies under health insurance, appeared on just 1.28% of all 76,290,000 prescriptions created in the single year from April 2016 to March 2017.²¹ Based on this, it can be inferred that patients rarely experience firsthand the benefits of the functions of the family or regular pharmacist that are associated with revision of the Pharmacists Act and health insurance system.

Schommer et al. conducted a 15-year longitudinal survey on patient and pharmacist views on the roles of pharmacists and reported seeing no change in either group. They

Table 2. Descriptive statistics of the questionnaire results for patients and pharmacists.

Item	n	Choice					Average	SD
		A: No, not at all				B: Yes, definitely		
		1: Close to A	2: Fairly close to A	3: Cannot say either way	4: Fairly close to B	5: Close to B		
<i>Patient</i>								
Q1	469	21	60	151	161	76	3.45	1.05
Q2	469	15	49	84	226	95	3.72	1.00
Q3	469	22	51	167	167	62	3.42	1.00
Q5	469	120	108	146	77	18	2.50	1.15
Q6	469	173	91	93	69	43	2.40	1.35
Q7	469	65	85	126	146	47	3.05	1.20
Q8	469	69	95	147	118	40	2.93	1.17
Q9	469	30	60	173	144	62	3.32	1.06
Q10	469	84	90	132	113	50	2.90	1.25
Q11	469	66	102	191	73	37	2.81	1.10
Q12	469	33	71	206	107	52	3.16	1.04
<i>Pharmacist</i>								
Q1	354	2	16	45	186	105	4.06	0.81
Q2	354	2	13	48	212	79	4.00	0.75
Q3	354	2	18	95	213	26	3.69	0.71
Q5	354	6	55	151	132	10	3.24	0.81
Q6	354	13	77	107	144	13	3.19	0.94
Q7	354	4	24	47	215	64	3.88	0.82
Q8	354	3	18	62	207	64	3.88	0.79
Q9	354	2	15	37	179	121	4.14	0.81
Q10	354	43	92	145	55	19	2.76	1.03
Q11	354	6	44	124	140	40	3.46	0.91
Q12	354	2	22	92	161	77	3.82	0.86

Table 3. Comparison of pharmacist and patient high rating rate in 2017.

Item	Patient		Pharmacist		RD ^b
	HR (%)	Difference from 2014 ^a	HR (%)	Difference from 2014 ^a	Ph–Pt (%)
Q1	50.5	−0.2	82.2	−0.3	31.7
Q2	68.4	−5.7	82.2	−1.5	13.8
Q3	48.8	−1.1	67.5	−5.0	18.7
Q5	20.3	1.2	40.1	−0.4	19.8
Q6	23.9	−0.7	44.4	0.3	20.5
Q7	41.2	3.4	78.8	−1.4	37.6
Q8	33.7	5.3	76.6	−3.6	42.9
Q9	43.9	1.7	84.7	1.9	40.8
Q10	34.8	2.1	20.9	−20.5	−13.9
Q11	23.5	−0.9	50.8	−0.1	27.3
Q12	33.9	−0.1	67.2	7.7	33.3

HR: high rating; Ph: pharmacist; Pt: patient.

The difference was calculated by subtracting the HR for 2014 from that for 2017.

^a2014 research data are cited from Oshima et al.⁹

^bRole discrepancy was defined as the difference between pharmacist HR and patient HR.

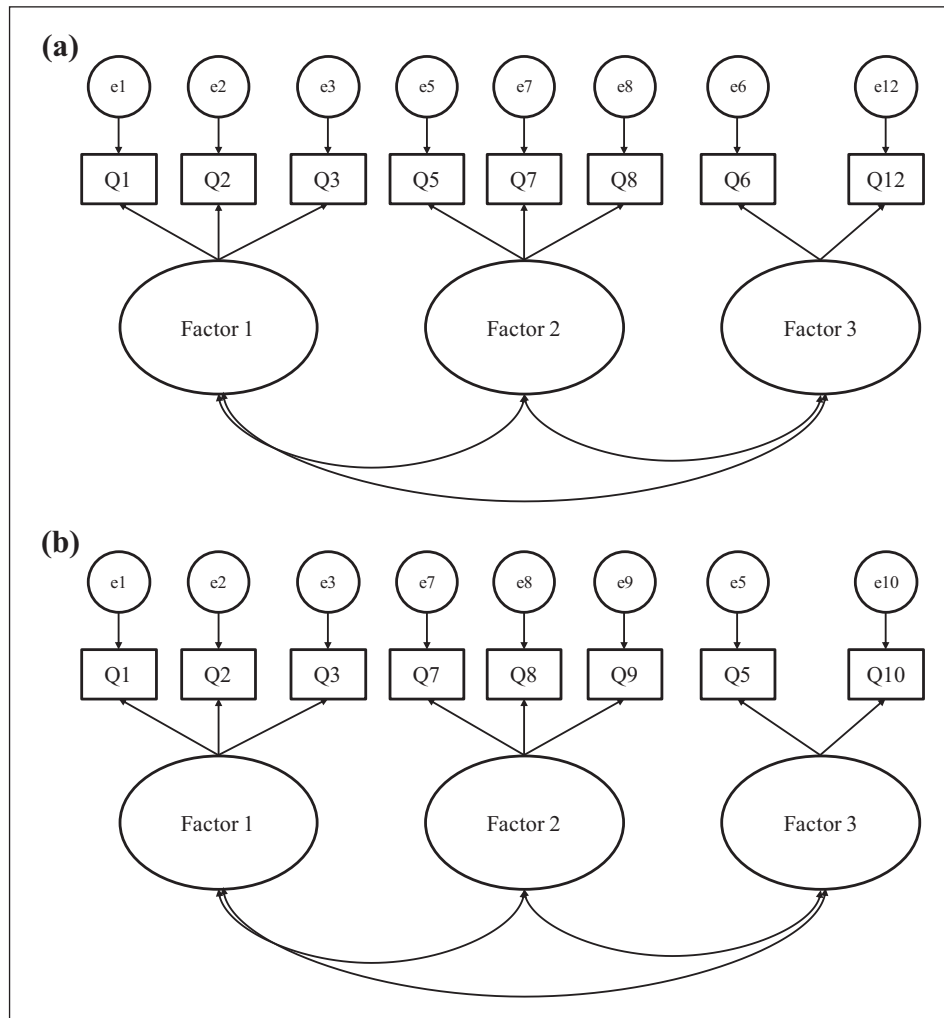


Figure 2. Model of “the roles of pharmacists”: (a) Patients—Factor 1: communication with the patient, Factor 2: understanding the patient, Factor 3: a medication specialist and (b) Pharmacists—Factor 1: communication with the patient, Factor 2: responsible monitoring of the patient, Factor 3: a family or regular pharmacist. This model is cited from Oshima et al.⁹

Table 4. Factors associated with patient high ratings for pharmacists as medication specialists.

		2017		2014 ^a		2017		2014 ^a	
		n	% of Pt Q11 ≥ 4	n	% of Pt Q11 ≥ 4	n	% of Pt Q12 ≥ 4	n	% of Pt Q12 ≥ 4
Original data	Q11	469	23.5	Q11	529	24.4	Q12	469	33.9
	Q10 ≥ 4	163	42.3	Q10 ≥ 2	440	27.1	Q3 ≥ 4	229	48.9
Additional condition	Q2 = 5	63	58.7	Q1 ≥ 5	70	50.0	Q10 ≥ 4	130	57.7
	Q5 = 5	40	60.0	Q6 ≥ 3	34	70.6	Q6 = 5	29	75.9
							Q1 ≥ 4	147	53.7
							Q6 ≥ 4	60	70.0

Ph: pharmacist; Pt: patient.

^a2014 research data from Oshima et al.⁹

explained this result in terms of dysfunction in the “care and respect cycle,” which is a conceptual representation of respect for pharmacists and patient care. Thus, they state that “without patient care” the patient reacts “without respect of the pharmacist,” and in turn, the pharmacist reacts

“without patient care.”¹² Our study also suggests the role of pharmacists was not rated highly because patients are not enjoying the explicit benefits of family pharmacists.

Factors in the 2014 study that enhanced the HR of Q11 (“The patient is more likely to ask questions about

medications to a pharmacist than his/her doctor”), were Q10, Q1, and Q6, which changed to Q10, Q2, and Q5 in the current study. In addition, factors that enhanced the HR of Q12 (“The patient thinks that a pharmacist is more of a medication specialist than a doctor”) including Q10, Q1, and Q6, changed to Q3, Q10, and Q6 in the current study. Based on these results, Q10 (“his/her family or regular pharmacist”) appears to be an important factor indicating that pharmacists act as medication specialists. In particular, patients who gave a high rating of 4 or 5 for Q10 in the 2017 survey were extracted. According to materials from the Ministry of Health, Labour and Welfare, coordination with the prescribing physician on duplicate prescribing of drugs, confirmation of drug interactions, and adjusting the prescription length based on leftover drugs is reportedly higher when the family or regular pharmacist guidance fee is calculated for health insurance reimbursement compared to when this fee is not calculated.²² This suggests the quality of medical care services provided by pharmacists is higher when the family or regular pharmacist guidance fee is reimbursed. For this reason, we surmised that patients who gave a high rating for Q11 and Q12 were probably feeling the benefits of the functions of family or regular pharmacists.

The 2014 survey identified Q1 (“The pharmacist makes it easy for the patients to talk to him/her”) and Q6 (“The pharmacist knows that the patient takes OTC medications and other items”) as the factors for Q11. However, in the currently study, this changed to Q2 (“The pharmacist talks by choosing his/her words carefully so that they are easily understood”) and Q5 (“The patient thinks that his/her pharmacist knows things about his/her lifestyle habits”). There are a number of possible reasons for this finding. For instance, there is the possibility that patients had expectations that pharmacists be not only easy to talk to (Q1) but also choose their words carefully to be easily understood (Q2). In addition, it could be their increased recognition of the need to have pharmacists know not only about their use of OTC medications and other items (Q6) but also about their lifestyle habits (Q5). Next, a reason for Q1 (“The pharmacist makes it easy for the patients to talk to him/her”), which was identified as the factor for Q12 and changed to Q3 (“The pharmacist understands complaints and responds appropriately”), may be that the patients have come to expect pharmacists to be not only easy to talk to (Q1) but also to give the appropriate responses (Q3).

The results of this study should be interpreted with several study limitations in mind. First, being an Internet survey completed by “monitors,” respondents were people who customarily collect their information online. Second, although data inspection is used to exclude insincere respondents from analysis, these responses may not have been removed completely. Third, the 2014 survey and 2017 survey do not necessarily include the same respondents, so results may be affected by sampling variation.

Conclusion

Of the 11 items in the questionnaire concerning pharmacists’ roles, the only change that occurred prior to and following the revision of the Pharmacists’ Act was a reduction in pharmacists’ score when evaluating their role as a “patient’s family or regular pharmacist (Q10).” Based on the current consensus in Japan, the reason for this is the high bar imposed by the health insurance system for becoming a family or regular pharmacist. Difficulty in implementing the system may be a background factor.²¹ The results of this study showed that the role discrepancy between patients and pharmacists that existed prior to revision of the law has not been resolved. In contrast, following the revision, patients appear to expect pharmacists to play an even more advanced role than before. Therefore, pharmacists must make an even greater effort to narrow and resolve the role discrepancy that exists between them and their patients.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval for this study was obtained from the Josai University’s ethics committee on medical research on human subjects (Approval number: 2018-15A).

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported in part by Grants-in-Aid for Scientific Research from the President of Josai University.

Informed consent

The respondents participated in the survey of their own free will and accord. Moreover, it was explained in advance that the questionnaire contained personal information and “special-care required” personal information. It was also explained that the responses would be handled according to Rakuten Research, Inc.’s “Guidelines on protecting personal information.” The participants responded to the questionnaire only if they consented

Supplemental Material

Supplemental material for this article is available online.

ORCID iDs

Shinji Oshima  <https://orcid.org/0000-0003-2638-0550>

Daisuke Kobayashi  <https://orcid.org/0000-0002-4463-9303>

References

1. Abe S. Japan’s strategy for global health diplomacy: why it matters. *Lancet* 2013; 382(9896): 915–916.

2. Prime Minister of Japan and His Cabinet. Health and medicine strategy, <https://www.kantei.go.jp/jp/singi/kenkouiryousuisin/ketteisiryou/dai2/siryou1.pdf> (2014, accessed 6 July 2018).
3. Ministry of Health, Labour and Welfare. The 6th medical care plan, https://www.mhlw.go.jp/seisakunitsuite/bunya/kenkou_iryousiryousiryou_keikaku/dl/tsuuchi_iryousiryou_keikaku.pdf (2012, accessed 6 July 2018).
4. Japan Pharmaceutical Association. Changes in the environment surrounding pharmacists: pharmacists' future vision, <http://www.nichiyaku.or.jp/action/wp-content/uploads/2013/03/visions.pdf> (2013, accessed 5 September 2017).
5. Inoue N, Yasuda K, Mori Y, et al. Changing concept of drug dispensing revealed by the text mining of past and present guidelines. *Jpn J Soc Pharm* 2018; 37(2): 81–90.
6. Saito M. Current status of community pharmacies: expectations as a health information hub, the enforcement of revised pharmaceutical and medical device act, and a new role as stakeholders. *Yakuga Zasshi* 2016; 136(2): 245–249.
7. Miwa R. Building the future using medical precedents as a suggestion for action: from medicine of the 20th century to healthcare and nursing care of the 21st century. *Int Pharm Intell* 2017; 1084: 3–8.
8. Worley MM, Schommer JC, Brown LM, et al. Pharmacists' and patients' roles in the pharmacist-patient relationship: are pharmacists and patients reading from the same relationship script? *Res Social Adm Pharm* 2007; 3(1): 47–69.
9. Oshima S, Senoo K, Negishi A, et al. Identification of the discrepancies between pharmacist and patient perception of the pharmacist's role as an advisor on drug therapy based on social science theory. *Biol Pharm Bull* 2016; 39(3): 313–322.
10. Ministry of Health, Labour and Welfare. A vision of pharmacy for the patients, http://www.mhlw.go.jp/file/04-Houdouhappyou-11121000-Iyakushokuhinkyoku-Soumuka/vision_1.pdf (2015, accessed 5 September 2017).
11. Guirguis LM and Chewning BA. Role theory: literature review and implications for patient-pharmacist interactions. *Res Social Adm Pharm* 2005; 1(4): 483–507.
12. Schommer JC and Gaither CA. A segmentation analysis for pharmacists' and patients' views of pharmacists' roles. *Res Social Adm Pharm* 2014; 10(3): 508–528.
13. Alahmed S, Anjum T and Masuadi E. Perceptions of mental illness etiology and treatment in Saudi Arabian healthcare students: a cross-sectional study. *SAGE Open Med*. Epub ahead of print 17 July 2018. DOI: 10.1177/2050312118788095.
14. Mill RD and O'Connor AR. Question format shifts bias away from the emphasised response in tests of recognition memory. *Conscious Cogn* 2014; 30: 91–104.
15. Weijters B, Baumgartner H and Schillewaert N. Reversed item bias: an integrative model. *Psychol Methods* 2013; 18(3): 320–334.
16. Robbins BN and Heiberger MR. Plotting Likert and other rating scales—joint statistical meetings, 2011: 1058–1066, http://www.montana.edu/msse/Data_analysis/Likert%20Survey%20Graphs.pdf (accessed 18 June 2018).
17. Heiberger MR and Robbins BN. Design of diverging stacked bar charts for Likert scales and other applications. *J Stat Softw* 2014; 57(5): 1–32.
18. R Core Team. *R: language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing, <http://www.R-project.org> (2005, accessed 15 March 2015).
19. Okita M, Yayoshi Y, Ohara K, et al. Comparison of the benefit feeling rate based on the Sho of OTC kakkonto, cold remedy and cold remedy with kakkonto combination product. *Biol Pharm Bull* 2017; 40(10): 1730–1738.
20. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull* 1990; 107(2): 238–246.
21. Ministry of Health, Labour and Welfare. A project to investigate and study the family pharmacist and pharmacy functions: a survey on family pharmacists and pharmacies, <https://www.mhlw.go.jp/file/06-Seisakujouhou-11120000-Iyakushokuhinkyoku/H29tyousahoukokusyo.pdf> (2018, accessed 24 July 2018).
22. Ministry of Health, Labour and Welfare. Outline of FY 2018 revision of medical fee, <https://www.mhlw.go.jp/file/06-Seisakujouhou-12400000-Hokenkyoku/0000197985.pdf> (2018, accessed 7 January 2019).