





## Original Research

# A qualitative study on the process of dietitians working in pharmacies to practice dietary habit improvement support in their daily work

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Received (first version): 30-Jun-2023

Accepted: 04-Aug-2023

Published online: 27-Feb-2024

### Abstract

**Background:** Recently in Japan, there have been some cases of pharmacies staffed with dietitians in an effort to improve their health support functions. However, there have been few reports on the effects of these efforts, and it has been pointed out that dietitians may not be fully exercising their professional abilities. We conducted a before-and-after comparison study in 2022 to confirm the effectiveness of collaboration between pharmacy dietitians and pharmacists in supporting patients with type 2 diabetes. **Objective:** This study aimed to investigate the process by which dietitians who participated in our research project became accustomed to providing continuous dietary counseling as a matter of habit. **Methods:** Semi-structured interviews were conducted with three dietitians and two pharmacists. The main questions asked were about 1) the nature of their work before they began providing the interventions, 2) the aspects they paid attention to while providing the interventions, 3) what they felt they had changed during the intervention period, and 4) what they considered obstacles to providing nutritional guidance in their pharmacies. **Results:** The responses of the participants regarding the nature of their work before they began providing interventions were mostly related to their “work as a dispensing clerk.” The dietitians also indicated their desire for more continuous dietary support. The responses of the participants regarding what they felt had changed during the intervention period included numerous references to having an “opportunity for trial and error” and obtaining the “cooperation of staff.” In the responses regarding what the participants considered obstacles, the dietitians mentioned “recognition by patients” and “an environment in which they can consult with patients.” **Conclusion:** This study suggests that “staff cooperation” is essential for dietitians to be able to provide continuous dietary consultation in pharmacies and that all staff must support the creation of an “environment” where dietitians can obtain opportunities for providing continuous dietary counseling.

**Keywords:** pharmacy; dietitians; organizational culture reform; dietary support

## INTRODUCTION

In Japan, countermeasures against a rapidly aging society and the accompanying shortage of hospital beds suggest a need to improve community care and preventive medicine. Thus, the “Vision of Pharmacies for Patients” presented by the Ministry of Health, Labor and Welfare voices an expectation that pharmacies provide comprehensive health support that goes beyond merely providing drugs to patients.<sup>1</sup> Hence, some pharmacies have begun retaining registered dietitians. The registered dietitians normally engage in the clerical task of dispensing prescriptions and provide nutritional consultations

upon pharmacist request. The presence of registered dietitians in pharmacies has reportedly led to significantly improved access to dietary support for patients and has proven effective in combating obesity;<sup>2,3</sup> their participation in home care management guidance can also be expected to improve patient nutritional status.<sup>4,5</sup> Conversely, it has been pointed out that the expertise of many registered dietitians may not be fully utilized.<sup>6</sup> The reasons for this include a lack of awareness on the part of patients, the fast pace of medical office work, and the underdeveloped educational infrastructure serving registered dietitians at pharmacies.<sup>7</sup> Regional medical care suffers when registered dietitians must engage in work that does not allow them to use their expertise.

To resolve issues related to the exercise of expertise by the registered dietitians working at pharmacies, it is necessary to extract the key points for organizational change by targeting staff and organizations that have actually “undergone an organizational transformation, moving from a state of unacceptable performance to one of acceptable performance” and examining the process by which they accomplished this.

Prior to writing this paper, we conducted an intervention trial (a pilot study of pharmacist-dietician collaborative support and advice (PDCA) for patients with type 2 diabetes in community pharmacy: a single-arm, pre-post study; hereinafter, PDCA). Here, registered dietitians and pharmacists collaborated in supporting patients with type 2 diabetes. We confirmed that

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“continuous dietary support for the same patient,” which was not available before the intervention trial, was incorporated into the daily work of the pharmacies that participated in this study.<sup>8</sup>This can be considered suitable in our quest to investigate the aforementioned “organizational transformation, moving from a state of unacceptable performance to one of acceptable performance.”

Depending on its nature, organizational change is broadly divided into gradual change and discontinuous change.<sup>9</sup> Gradual change is a continuous change where the functioning of the organization improves during a period of stability. Discontinuous change, conversely, is a change during periods of instability aimed at creating a vision, strategy, sense of values, or a completely new operations system that defines the nature of each component of the organization. The change within the pharmacy dealt in this study involves the establishment (or re-creation) of a new operations system or values for registered dietitians within the pharmacy; thus, it can be classified as discontinuous change. The representative studies on the process of discontinuous change include the theories of Nadler<sup>9</sup> and Walton.<sup>10</sup> Regarding these academic trends, Kotter<sup>11</sup> explains in greater detail the “preparatory stage for change” and considers the relationship with corporate culture an important issue.

Therefore, in this study, we aimed to conduct an inductive analysis of interviews with both registered dietitians belonging to organizations that actually performed interventions and pharmacists who supported them. Further, we explored perceptions of the process of organizational change in pharmacies from the perspective of registered dietitians and pharmacists through a hybrid approach that deductively evaluates the entire effort in line with Kotter’s theory.

## METHODS

### Study Design

We conducted an exploratory study based on an interpretational perspective, which involved semi-structured interviews with registered dietitians and pharmacists who participated in the PDCA study and provided interventions. Further, this study adopted thematic analysis and used a hybrid approach that combined the deductive and inductive analysis methods proposed by Braun and Clark.<sup>12</sup> In other words, we first conducted an inductive analysis on the data obtained from interviews and then applied this to the existing theories. This hybrid approach is suitable when there is only one unit of analysis or when the comparison criteria required for inductive analysis methods are unclear.

### Research Participants

It was necessary to conduct interviews and examinations of staff and organizations who have actually “undergone an organizational transformation, moving from a state of unacceptable performance to one of acceptable performance.” The pharmacy staff who participated in the PDCA study are suitable as survey participants because they had undergone this process. Furthermore, it is easy to consider the “preparatory

stage for change” mentioned in the study design for those who participated in the PDCA study. Additionally, as cooperation between registered dietitians and pharmacists is one of the themes of the PDCA study, we must interview both registered dietitians and pharmacists. Thus, the study participants were the three registered dietitians who provided nutritional counseling and two registered pharmacists who worked at the same pharmacy. Anyone who could not be contacted when the study was underway was excluded.

### Overview of the PDCA Study

The PDCA study is a before-and-after comparison involving a single group in the field of community pharmacies. The PDCA study team comprised the principal investigator, a diabetes specialist, a registered dietitian, a pharmacist, and a researcher from the company to which the registered dietitian and the pharmacist belonged, all of whom worked together to implement the study. The intervention period lasted six months, with the registered dietitians and pharmacists working together to provide meal support to patients with type 2 diabetes. During the intervention period, the registered dietitians provided meal support for 15–20 minutes once a month to each of the 2–3 patients who had provided their consent. At the beginning, the registered dietitian interviewed the participants about their diet, hopes and thoughts regarding diet therapy, and lifestyle. Based on blood test results and body weight, patient nutritional status was evaluated, and targets were established while working with the patient. For each instruction provided, a record of the instruction was retained and shared with the pharmacist. The registered dietitians met the principal investigator once a month to share patient status and confirm guidance policy. The eight patients who completed the intervention period saw their mean HbA1c values decrease from 7.3 (pre-intervention) to 6.6 (post-intervention).

### Interview Methods

Interviewer and interview method: The lead author was the interviewer. All interviews were scheduled by an intermediary using the Slack (Slack Technologies, LLC) messaging function. All interviews were conducted online via Zoom (Zoom Video Communications). The interviewees were interviewed once between October and November. Each session lasted approximately 30 minutes and was conducted through computers at their workplace. The participants were mainly queried on the following issues: 1) their work duties before the intervention; 2) precautions taken during the intervention; 3) gains realized through the intervention; 4) problems related to providing nutritional guidance at pharmacies.

### Analysis Method

All interviews were recorded with the participants’ consent and transcribed by the researcher. During this process, the speakers’ identities were withheld using further checks conducted to ensure that no personally identifiable content was present. As mentioned in the Study Design subsection, this study adopted a hybrid approach, combining inductive and deductive analysis techniques. The data analysis in the inductive analysis process was conducted in accordance with



the six-step guide to thematic analysis presented by Braun and Clark.<sup>12</sup> First, all the researchers reviewed the transcribed data and gained a complete understanding of its content. Second, coding was performed, with text data segmented into smaller units according to actions, events, and thoughts; subsequently, they were coded. Third, for each segmented text data, coding result was observed, with themes representing more abstract concepts identified. Fourth, these themes were reviewed, and it was confirmed that the theme established in the third stage maintained a consistent coding process that included the interpretation of the text data. Fifth, the lead author set the final theme and reinterpreted it based on Kotter's theory of organizational change. All coding work was performed using the qualitative data analysis software NVivo (QSR International). Using the deductive analysis process, we attempted to examine the themes generated in parallel with the eight-step process of organizational change outlined by Kotter: (Step 1: Cultivate a sense of crisis; Step 2: Build a team effort to promote change; Step 3: Build and present a vision; Step 4: Broadly communicate the vision; Step 5: Empower several human resources; Phase 6: Deliver short-term wins; Step 7: Leverage transformation gains to drive further change; Step 8: Embed new ways into corporate culture).<sup>11</sup> Kotter's eight-step process highlights the two processes of "preparing for change" and "implementing change,"<sup>11</sup> which we believe were suitable for organizing the environment of participation in the PDCA study and understanding the interventions that have been implemented and the resulting culture construction within the pharmacy. Finally, the analysis results were published. The Japanese version of the Standards for Reporting Qualitative Research (SRQR)<sup>13</sup> was used in writing [this paper].

### Ethical Considerations

This research was conducted in compliance with the Declaration of Helsinki and the "Ethical Guidelines for Medical and Biological Research Involving Human Subjects." The study was conducted with the approval of the Research Ethics Review

Committee of Osaka University of Pharmaceutical Sciences (now the Research Ethics Review Committee of the Faculty of Pharmacy, Osaka Medical and Pharmaceutical University).

## RESULTS

### Participants

The interviews were conducted with three registered dietitians and two pharmacists, and the data were recorded. All three registered dietitians were women in their twenties, with one pharmacist being a male in his thirties and the other a female in her thirties (Table 1).

Subjects	Age	Sex
Dietitian A	20s	Female
Dietitian B	20s	Female
Dietitian C	20s	Female
Pharmacist A	30s	Male
Pharmacist B	30s	Female

### Qualitative analysis of the interviews with registered dietitians and pharmacists

#### Summary of qualitative analysis results

A qualitative analysis of the data obtained from the interviews was conducted using an outline that showed the processes that occurred until nutrition counseling by registered dietitians became established. This is shown in Figure 1. Prior to participating in the intervention trial, the registered dietitians in the study provided one-off nutritional consultations at the request of pharmacists, but they had few opportunities to talk with patients and provide nutritional counseling. The

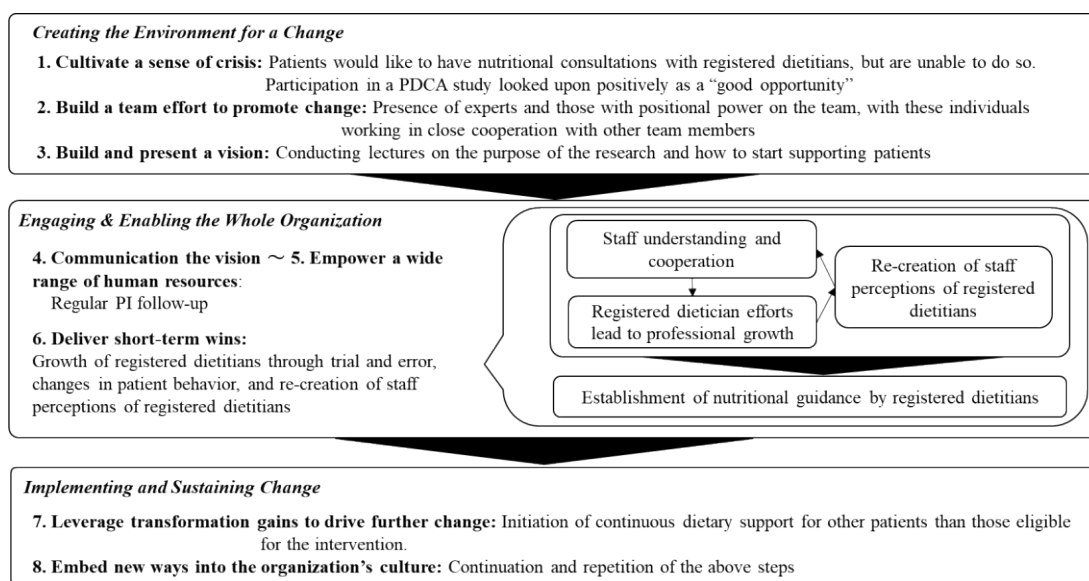


Figure 1. Overview of the establishment of nutritional guidance by registered dietitians as obtained in this study

pharmacists also provided the registered dietitians with the same training as other administrative staff who were not registered dietitians and were aware that the registered dietitians could not provide nutritional counseling. During the intervention period, the registered dietitians could provide dietary guidance by following up with pharmacists, securing an appropriate environment for such guidance, and adjusting their schedules accordingly. This led to the professional growth of the registered dietitians and changes in staff perception of them, creating a virtuous cycle that made it easier to provide nutritional consultations, as patients could receive nutritional consultations with registered dietitians at pharmacies. Next, we detail the experiences of the registered dietitians and pharmacists before and after the intervention.

### Comments surrounding work prior to intervention

The comments of the registered dietitians prior to the intervention were classified into three categories: "job details," "a desire to demonstrate professional ability," and "a sense of being unable to fulfill one's duties." The pharmacists' comments were classified into four categories: "job details," "desire to demonstrate professional ability," "education for registered dietitians," and "nutrition consultations."

### Registered dietitian expectations and education

Prior to the registered dietitians being assigned to the pharmacy, the pharmacists seemed to desire their presence there, with Pharmacist A being especially enthusiastic when learning that a registered dietitian would be stationed at their pharmacy.

"I was grateful upon first learning that a registered dietitian would be joining us, and I'm sure pharmacy staff felt the same way. Long before this, I had mentioned to the company that having a dietitian join our staff would be a great help." Pharmacist A

### Job details

Both the registered dietitians and pharmacists said that registered dietitians were mainly engaged in dispensing medications and could not provide nutritional counseling continuously. Busy with requests from the pharmacist and producing the pertinent paperwork, Registered Dietitian B told us that she had no experience in continuously observing patient progress and could not utilize the PDCA (Plan-Do-Check-Act) cycle. Pharmacist A also did not actively encourage their registered dietitians to provide nutritional counseling.

"In the past, there were several occasions where we handed over pertinent paperwork on a case-by-case basis, but it was rare for us to do any follow-up on patient symptoms for the entire six months. Therefore, the PDCA cycle or the fact that we couldn't utilize it fully proved to be a major factor." (Registered Dietitian B)

"When I first started working, for the first year, I was mainly doing medical clerical work to become accustomed to the pharmacy rather than working as a registered dietitian. I was more than ready to begin to tackle registered dietitian duties, but it seemed like I never got the opportunity." (Pharmacist A)

### Desired duties

Regarding the job details described in 2-2-1, the registered dietitians expressed a desire to provide more nutritional counseling, with pharmacists also expressing an interest in having dietitians provide such counseling. Registered Dietitian A said that she recognized that being able to participate in this intervention trial would give her an opportunity to engage in activities that she found meaningful.

"I wanted to provide more continuous face-to-face nutritional counseling, so I jumped at the opportunity to do so when invited to participate in this trial." (Registered Dietician A)

"She let me know that she wanted to do more work as a registered dietitian." (Pharmacist B)

Matters to heed during the intervention The registered dietitians classified matters of importance during the intervention into "providing guidance tailored to the patient" and "communications" categories. The pharmacists placed these into the three categories of "providing follow-up during nutritional counseling," "securing a proper environment for counseling," and "stress and dissatisfaction."

### Guidance tailored to the patient

It was found that, when providing nutritional consultations, the registered dietitians emphasized "getting to know the whole of the patient," "considering resistance to diet therapy," "considering the patient's physical condition," and "providing guidance specifically tailored to the patient."

"Each time I see a patient, I ask how they are doing. Further, when I first sit down with the patient, I inquire about their expectations. Patients will often say they don't want strict nutritional consultations like those provided in hospitals because those make them uneasy, with some patients mentioning a desire to have meal records, while others express a desire to receive recipes. Thus, I feel like I must come up with new recipes each month, although some patients have no interest in receiving these. In a nutshell, I emphasize providing guidance while considering patient desires." (Registered Dietitian B)

### Communication methods

The communication method category included four codes (behaviors): "start with small talk," "focus on listening," "do not use jargon," and "help the patient relax." The following is a typical comment.

"Sometimes the listener can become the center of attention. However, I think it is extremely important to listen to the patient. Although providing proper guidance is important, if it is not done after first listening to the patient, the patient will probably not follow the guidance anyway." (Registered Dietitian A)

"It's almost always best to start with small talk. I typically ask how the patient has been doing lately, and we chat a little. Helping the patient relax even a little goes a long way in getting them to talk." (Registered Dietitian C)



### Follow-up during nutritional counseling

The pharmacists mentioned that other staff members would follow up with the registered dietitian during nutritional counseling. Pharmacist A spoke of the need for flexible duty-sharing among other staff members during the time registered dietitians were providing consultations, saying “everyone needs to give 110%.”

“When I’m doing clerical work and am told that a patient has come, I ask another staff member to cover for me. It’s like changing jobs mid-stream; so you really have to put in 110%.” (Pharmacist A)

### Creating a positive environment for consultations

In addition to the division of duties covered in 2-3-3, the pharmacists spoke of accounting for pharmacy structure and work times. Pharmacist A, in particular, mentioned issues related to having a dedicated space to provide nutritional counseling. Conversely, Pharmacist B mentioned asking in advance that the patient and registered dietitian meet at the pharmacy during hours when business was typically slow, helping avoid any conflicts.

“We have to make time for individual nutritional consultations; this created problems for the pharmacy. We only have two customer service booths; at first, we used one of them and then moved over to the sofa in the waiting room. However, this proved difficult during busy times.” (Pharmacist A)

“Initially, we would often only have two staff members present; thus, the work never seemed to end. Further, I believe that the nutritionist adjusted consultations times (with the patient) by choosing times when it was not so crowded.” (Pharmacist B)

### Stress and dissatisfaction

Staff members, including pharmacists, were positive about participating in the intervention trial, but Pharmacist A said that the follow-up described in 2-3-4 and 2-3-5 created fatigue and stress among staff members, particularly during the early stages of the intervention.

“It initially took some time for us to get used to the registered dietitian leaving to provide dietary guidance; at times, we would get a little irritated or tired. I definitely felt a little bit of stress and fatigue.” (Pharmacist A)

### Changes during the intervention period

The registered dietitians classified changes occurring during the intervention period into three categories: “personal growth,” “changes in staff perceptions,” and “cooperation and collaboration with other staff.” The pharmacists, conversely, classified these into four categories: “growth of registered dietitians,” “change in the perception of registered dietitians,” “increase in information sharing among staff members,” and “reductions in dissatisfaction and stress.”

### Professional growth of registered dietitians

Both the registered dietitians and pharmacists recognized the professional growth in the registered dietitians. We

assumed four codes (behaviors) for the registered dietitians: “opportunities for trial and error,” “an awareness of ‘things unknown’”, “changes in the way we think about nutritional counseling,” and “job satisfaction.” We assumed two codes (behaviors) for the pharmacists: “realization of growth as a registered dietitian” and “what a hard-working registered dietitian looks like.” The following are typical comments.

“Sometimes even when I seemingly overcome problems, things really don’t improve, and I think that I must improve the plan or rethink the issue at hand. Thus, being able to provide nutritional guidance according to the PDCA cycle was a great learning experience.” (Registered Dietitian B)

“Seeing her working so hard to ready pertinent paperwork, choosing her words so carefully when explaining things to patients, and so on, really showed me how much she’s grown.” (Pharmacist A)

### Changes in staff awareness and improved satisfaction

Both the registered dietitians and pharmacists recognized changes in staff perceptions. In response to the professional growth of the registered dietitians explained earlier, Pharmacist A stated that he recognized the need for the registered dietitians on the pharmacy staff to perform tasks that took advantage of their expertise, with dissatisfaction and stress reduced accordingly. Registered Dietitian A also stated that she felt that the role of registered dietitian was being established within the pharmacy.

“Nutritional consultations have come to be thought of as normal, and it seems like an environment in which registered dietitians provide nutritional consultations has been established, which definitely makes me happy.” (Registered Dietitian A)

“I feel confident that her time as a registered dietitian has arrived. While technically a registered dietician, she was definitely underutilized, tasked with the clerical side of nutrition (in terms of job details). Everyone’s thinking to the effect that she had to do this kind of work changed; I guess it involved a change of heart. It seems like everyone’s frustration with her interrupting her office work for nutrition consultations has decreased, and there is also less stress.” (Pharmacist A)

### Strengthening cooperation among staff

Both the registered dietitians and pharmacists noted stronger cooperation among staff. For the registered dietitians, this was encompassed in three codes (behaviors): “understanding and cooperating with pharmacists,” “helping out with clerical duties,” and “collaborating with the pharmacist.” For pharmacists, “increased information

sharing among staff” was added. The following are typical comments for both.

“Owing to this research, I could provide nutritional consultations every month; gradually, I began to get questions from staff, such as ‘Who’s coming today?’ and ‘How is that patient doing?’ Cooperation has been forthcoming, and it’s gradually become easier to provide nutritional consultations.” (Registered Dietitian A)



“People other than those who participated in this study have had nutritional consultations, and I believe there are more chances [for the nutritionist] to share information about such patients with the pharmacist, for example, right after having a prescription filled. (Pharmacist B)

### Issues in providing nutritional guidance at pharmacies

Both the pharmacists and registered dietitians cited “encouragement by registered dietitians” and “staff cooperation” as issues that arise when providing nutritional

guidance in a pharmacy setting. In addition, the registered dietitians mentioned “patient recognition” and “existence of counselors,” while the pharmacists spoke of “pharmacist encouragement.”

### Cooperation of staff and encouragement of registered dietitians

Both the registered dietitians and pharmacists said that staff cooperation is essential for the registered dietitian to provide nutritional guidance in a pharmacy setting. Registered Dietitian A and Pharmacist A talked about the necessity of providing support for clerical tasks that became understaffed during nutritional consultations. Registered Dietitian A also mentioned the need to seek out an environment in which the registered dietitians can obtain further cooperation.

“Cooperation is important. With the cooperation of the pharmacist and the clerical staff, I could fulfill my duties as a registered dietitian. While providing nutritional consultations, there was no way I could take care of clerical tasks; thus, the pharmacist had to wait until I could get to these. This forced us to create an environment where cooperation would be forthcoming. I truly believe that creating such an environment is key.” (Registered Dietitian A)

“Understanding by the surrounding staff may be the most important thing. Until such understanding is achieved, there will always be matters such as unneeded help and time needed for follow-up. It’s important that everyone understands this so that we can move on. (Pharmacist A)

### Patient recognition

Discussions also addressed issues related to the degree to which patients are aware that registered dietitians are present at pharmacies. Registered Dietitian C spoke of the need to publicize the presence of the registered dietitian in the pharmacy through the use of recipes, posters, and other similar means.

“I helped put posters up on the inside and outside of the pharmacy. This has helped customers—even long-time customers—become aware that there is a registered dietitian in the pharmacy. I thought it would help make it easier to hold nutritional consultations if recipes that included information showing a registered dietitian was available at the pharmacy were displayed in the store.” (Registered Dietitian C)

### Existence of a consultant

There were also comments alluding to the necessity of an

environment where regular consultations can be offered to provide nutritional counseling frequently. Registered Dietitian A mentioned that it was easier to provide nutritional counseling during the intervention period of the PDCA study, which was held once a month. With only a few pharmacies with multiple registered dietitians, regular meetings have helped maintain and improve the quality of patient guidance.

“An appropriate environment for providing consultations is also critical. I was given the opportunity to meet once a month, making it extremely convenient. I believe most pharmacies are similar, but not having two registered dietitians led me to worry that there would not be anyone I could reach out to should I have any questions. I really wanted an environment where I could provide regular consultations. As it was for the patient, thought it necessary to have an environment where I could provide consultations.” (Registered Dietitian A)

### Pharmacist encouragement

The participants also talked about the need to make it easier for the registered dietitians to provide nutritional counseling through pharmacists’ routine administrative efforts. Pharmacist B thought it might be easier for the dietitian to provide follow-up guidance by offering detailed advice on meals when filling prescriptions.

“In most cases, I believe that discussions with patients when filling prescriptions center on the medication, with nutritional aspects rarely addressed. Therefore, if the pharmacist and patient discuss diet at all, even if in passing, this could be passed on to the nutritionist and used for nutritional counseling.” (Pharmacist B)

## DISCUSSION

We conducted a qualitative study on registered dietitians and pharmacists who had actually participated in the intervention trial regarding registered dietitians’ daily task of providing patients with nutrition guidance. Although some surveys have explored the actual working conditions of registered dietitians working at pharmacies, this is the first study to investigate the process of forming a culture of continuous guidance within the pharmacy setting. In this discussion, we attempted to investigate the changes in the pharmacies surveyed following the eight-step process outlined by Kotter<sup>11</sup> (Step 1: Cultivate a sense of crisis; Step 2: Build a team effort to promote change; Step 3: Build and present a vision; Step 4: Broadly communicate the vision; Step 5: Empower several human resources; Phase 6: Deliver short-term wins; Step 7: Leverage transformation gains to drive further change; Step 8: Embed new ways into an organization’s culture). Kotter’s eight-step process highlights the two processes of “preparing for change” and “implementing change,”<sup>11</sup> which we believe are suitable for understanding the interventions that have been implemented and the resulting cultural shift within the pharmacy.

In Kotter’s first step (Cultivate a sense of crisis), the task is to find and consider professional growth opportunities. In the interviews that were a part of this survey, we were told that



prior to the intervention trial, the registered dietitians mainly performed clerical tasks. A previous report by Horii et al.<sup>7</sup> suggests that most registered dietitians working at pharmacies spend most of their time performing clerical duties. Therefore, we can assume that this was basically true for the pharmacies targeted by our study. Thus, pharmacy members who were the participants of this survey viewed participation in the PDCA study as a “good opportunity,” with registered dietitians considering this “an opportunity to engage in meaningful work,” as mentioned earlier, satisfying Kotter’s first step.

Regarding the second step (Build a team effort to promote change), the PDCA study team comprised in-store employees-researchers-diabetes specialists and included experts familiar with patient dietary support and researchers experienced in conducting intervention studies. All members worked together to achieve the common goal of “providing support to type 2 diabetes patients by providing regular nutritional guidance by registered dietitians.” As mentioned earlier, this support was achieved through on-site cooperation and regular consultations. Horii et al. also cited “the understanding of pharmacists, staff, and others” as one of the challenges facing registered dietitians and dietitians working at pharmacies and drug stores. He thought that, until nutrition counseling by registered dietitians became firmly entrenched, in addition to on-site cooperation, regular monitoring by people with positional power and experts would be important.

Concerning the third (Build and present a vision) and fourth (Broadly communicate the vision) steps, the vision of this survey and PDCA study involved having registered dietitians continuously provide nutritional guidance as a part of their daily work and verify specific effects. The purpose of the study was explained online by the principal investigator to all the participants prior to the intervention period. The vision of this study is easy to imagine for the registered dietitians, pharmacists, and headquarters employees; the realization of this vision was anticipated even before the research was begun. Thus, this would seem to have satisfied Kotter’s 3rd and 4th steps. They are small organizations with less than ten employees; therefore, it may be hard to apply Kotter’s fifth step (Empower a wide range of human resources) to pharmacies. Nevertheless, the way pharmacists’ comments about “stress and dissatisfaction” are transformed into those in “Changes in staff awareness and improved satisfaction” can be thought of as applicable to Kotter’s fifth step.

The “growth of the registered dietitian,” as described by the pharmacist, and improvements in patient treatment can be thought of as corresponding to Kotter’s sixth step. Regarding the forming of an organization’s culture, Schein indicates that organizational culture is formed and established as a result of the collective learning (organizational learning) of its members.<sup>14</sup> The group learning in this survey can be thought of as corresponding to the trial-and-error support provided by the registered dietitians to patients and the follow-up that the registered dietitians provide. It is assumed that this has resulted in a fine-tuning of pharmacists’ perception of the registered dietitians, together with a strengthening of cooperation among

staff members. This can be thought of as corresponding to the interaction between “beliefs and values” and “policies and practices,” as described by Denison,<sup>15</sup> with this thought of creating a virtuous cycle where it becomes easier for the registered dietitians to provide nutritional consultations.

Regarding Step 7 (Leverage transformation gains to drive further change), statements such as those in “Strengthening cooperation among staff” show us that nutritional guidance was provided even to patients not targeted for intervention. In other words, through successful experiences with intervention targets, the registered dietitians and pharmacists are creating more opportunities for patient support beyond the research framework.

Relating to Step 8 (Embed new ways into an organization’s culture), while impossible to mention at this stage because it is positioned as a continuation of the above processes and an iterative process, it is expected that the changes within the organization will continue and take root.

Despite its merits, this study has the following limitations. First, the number of survey participants was limited. However, all the registered dietitians and pharmacists who were actually involved in the intervention were targeted. All of them confirmed that they had shared all their opinions and experiences, and it would seem impossible to increase the number of participants to gain a deeper understanding of the organizational changes that occurred during the intervention period of the PDCA study. Second, as of 2022, there is no health insurance score for nutritional guidance provided at pharmacies. Nevertheless, if insurance coverage should be available in the future, it is highly likely that various matters in the stage of this survey where change is prepared for would change. Third, as this study aimed to investigate the formation of culture within pharmacies qualitatively, we could not observe any quantitative changes in the attitudes of the registered dietitians toward their duties.

Despite the above limitations, this study comprised interviews of both the pharmacists and registered dietitians, in which they were asked about the process by which the registered dietitians began to provide continuous nutritional guidance at the pharmacies; this constituted the first attempt to conduct a qualitative analysis on this subject matter. We found that participation in the PDCA study provided an opportunity to empower the registered dietitians and pharmacists to support patients. We also believe that this research is destined to serve as a reference for strengthening trial and error diet support efforts by other professionals, including registered dietitians in a community medicine setting.

## CONCLUSION

The formation of a culture in which registered dietitians continue to provide dietary support, which was observed at pharmacies that participated in the PDCA study, was implemented more or less in line with Kotter’s eight-step process. At the stage where change is implemented, understanding and cooperation of pharmacy staff is essential if the registered dietitian is to



demonstrate their ability and motivation. Thus, the growth of registered dietitians and such short-term results as changes in patient behavior become evident, with this serving as a reset of registered dietitian recognition, creating a virtuous cycle in which registered dietitians are more likely to demonstrate their professional abilities.

## ACKNOWLEDGMENTS

We would like to thank all the registered dietitians and

pharmacists who provided their cooperation for this study.

We would also like to express our sincere gratitude to Rintarō Imafuku of the Gifu University Medical Education Development Center for his advice.

## CONFLICTS OF INTEREST

There are no conflicts of interest to disclose regarding this study.

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