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Research on social skills before and after practical training of pharmaceutical students

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Abstract

Background: Social and self-management skills for communicating, and acting in ways that build smooth interpersonal relationships with patients are required in clinical settings. We evaluated pharmacy students' acquisition of social and self-management skills after their practical training.

Methods: We conducted a pre– and post-training survey with 85 pharmacy students (5th graders), using Kikuchi's Scale of Social Skills-18 (KiSS-18) questionnaire and analysed them. We also evaluated whether students acquired the same skills even though training facilities differed.

Results: After practical training, KiSS-18 total scores significantly increased, from 55.2 ± 10.5 to 60.5 ± 11.3 (p<0.001). Total scores differed depending on whether training facilities were independent or chain pharmacies.

Conclusion: Students' social skills materially improved, but the degree of improvement varied depending on the training facility. Grasping differences between facilities and ensuring that appropriate practice can be conducted is necessary.

Keywords: *Kikuchi's Scale of Social Skills-18, Pharmacy Education, Practical Training, Social Skills*

Introduction

Today, medical technologies have greatly advanced in clinical settings, and safe, high-quality medical services are required. Additionally, people are paying more and more attention to health and medical services, and they require medical staff to provide specialised information (Eguchi, 2013). In Japan, pharmacists are required to be involved with the majority of patients in order to provide high-quality drug therapy. To achieve this goal and be involved in patient medication, pharmacists need to have a solid understanding of a patient's background (Hermansen *et al*., 2001). Therefore, pharmacists are required to have the social skills necessary to establish trust through good communication with patients and their families (Cleland *et al*., 2007).

Pharmacy students require practical training not only for medical knowledge, but also for basic education as a medical professional (The Pharmaceutical Society of Japan, 2016). Practical ability includes being thoughtful and caring, delivering clear and easy-to-understand instructions about medications, and being able to carry on a conversation with clients and others. However, how well students who experience practical training acquire practical ability has not been evaluated. Neither has whether different training facilities provide students with equal skills and abilities.

In Japan, a rating scale for the ability to build good relationships with others (social skills) and for self-management, the Kikuchi's Scale of Social Skills-18 (KiSS-18) (Kikuchi, 2007) has been widely used in nursing education to evaluate nursing students' practical abilities in clinical settings (Ueno, 2005). As a social skill and self-management scale, KiSS-18 has been reliably established and validated; it is widely used in various fields (Kikuchi, 2007; Hayashi *et al*., 2011; Teramachi *et al*., 2011). KiSS-18 has also been used for both university students and nursing students' education (Takashima *et al*., 2004; Fujino *et al*., 2005; Mao, 2008). It has also been used to evaluate interpersonal skills, which were found to have improved, for students in physiotherapy (Honda *et al*., 2015) and occupational therapy (Abe *et al*., 2008). Social skills were reported to have been acquired longitudinally through practical training (Takashima *et al*., 2004; Fujino *et al*., 2005). From these facts, we see that KiSS-18 can be applied appropriately to evaluate pharmacy students' changes in social skills before and after practical training.

In Japan, a pharmacy mainly dispenses medicines based on a doctor's prescription. In Japan's Pharmaceutical Affairs Law, a (dispensing) pharmacy is defined as "...a place where pharmacists conduct dispensing work for the purpose of sales or awarding for medicine" (The Law on Securing Quality, Efficacy and Safety of Products Including Pharaceauticals and Medical device, 1960). More specifically, dispensing is based on a prescription from a doctor at a hospital; pharmacists explain to patients how to take their medicine, its effect, how it works, its side effects, and so on. Additionally,

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pharmacists strive to eliminate anxiety about medicine and to prevent difficulties related to dosing and treatment by communicating well with patients. In these circumstances, students practice for 11-weeks under the guidance of a practicing pharmacist. Formative evaluation is conducted on practical training, and each student is evaluated according to the degree of progress. Additionally, acceptance standards for practical training facilities are limited to institutions in which a pharmacist, who is accredited by a certified practical training teaching pharmacist system that is certified by Japan Pharmacists Education Centre, conducts training.

Therefore, this research's purposes are to evaluate changes in students' social skills before and after practical training and to grasp differences in students' social skills according to the raining facility. Thus, we conducted a KiSS-18 questionnaire survey with students and evaluated the level of social skills acquired after practical training. Additionally, we studied whether students in different training facilities gained social skills equally.

Methods

1. Period and subjects

We conducted a questionnaire survey with 85 (16 male and 69 female) pharmacy students (5th graders) at the School of Pharmacy and Pharmaceutical Sciences, Hoshi University, before and after practical training, from April 2014 to March 2015.

2. Timing of the questionnaire

After explaining our purposes, ethical considerations involved and summarising the study, we analysed 85 students' questionnaires before and after the 11-week practical training. In conducting the questionnaire, we explained that individual survey results would not be reported to the training facilities' pharmacists, so students would not suffer advantages or disadvantages based on survey results. Thus, we urged students to answer the questionnaire honestly.

Table I: Table I: Kiss-18 Questionnaire

No	Question	Answers				
		Completely disagree	Almost Completely disagree	Moderately agree	Almost Completely agree	Completely agree
1	Can you carry on a conversation with others without frequent pausing?					
2	Can you give clear direction to others about what you would like to be done?					
3	Can you properly help others?					
4	Can you calm people down when they are angry?					
5	Can you quickly initiate a conversation with a stranger?					
6	Can you properly handle problems that you have with people around you?					
7	Can you properly control your fears and anxiety?					
8	Can you reconcile with others after a fall-out?					
9	Can you figure out what to do and how to do it for your job?					
10	Can you join a conversation without getting nervous?					
11	Can you correctly respond to accusations made by others?					
12	Can you quickly figure out problems you may have with your work?					
13	Do you feel free to express your feelings and emotions?					
14	Can you properly process conflicting information?					
15	Can you properly introduce yourself when you first meet someone?					
16	Do you apologise as soon as you realise that you have made a mistake?					
17	Can you get along with others even if their opinion is different from yours?					
18	Are you comfortable with setting career goals?					

Table II: The six sub-scales of social skills and their descriptions

No	Sub-scale Name	Descriptions of Social Skills Sub-scales	Kiss Item No			Score
I	Basic skill	Skills that enable people to start a conversation, ask questions, and introduce themselves.	1	5	15	
II	Advanced skill	Skills that enable people to ask others for help, give a direction, and apologise.	2	10	16	
III	Emotional management skill	Skills that enable people to realise their own feelings, and express their emotions, and overcome their fears.	4	7	13	
IV	Offence management skill	Skills that enable people to help others, reconcile with others, and control their own feelings.	3	6	8	
V	Stress management skill	Skills that enable people to participate in complex conversations, address their own mistakes, and well-respond to accusations made by others.	11	14	17	
VI	Planning skill	Skills that enable people to recognise their own abilities, and make decisions.	9	12	18	

3. Questionnaire

3-1. Measurement of social skills

We used the KiSS-18 rating scale (Kikuchi, 2007) for rating social skills (Table I). Each question in KiSS-18 can be answered according to the following five-point Likert scale: completely disagree (one point), almost completely disagree (two points), moderately agree (three points), almost completely agree (four points), and completely agree (five points). The higher the score, the stronger the indication of mature social skills, ranging from 18 (minimum) to 90 (maximum) points. KiSS-18 has six sub-scales (Basic, Advanced, Emotional management, Offence management, Stress management, and Planning skills) included in its "Social Skills Checklist" (Goldstein *et al*., 1980) (Table II).

3-2. Differences in acquired social skills depending on training facilities

To evaluate differences in acquired social skills based on training facilities, we added a training-facilities item based on health insurance classifications (independent or chain pharmacies) to the questionnaire. Individual students were automatically assigned to an independent or linked pharmacy practice facility by the pharmacist organisation in the area where the student lives.

4. Ethical considerations

Prior to distributing the questionnaire, we informed subjects of the study's purposes and content, how data would be processed, the use of survey results, privacy protection, and contact details for inquiry in written form. In addition, we explained to each subject that participation was strictly voluntary and anonymous: participants would not be identified, nor receive any advantage or disadvantage by completing the questionnaire. Based on these ethical considerations, consent to participate was indicated by participants' submitting the questionnaire (placing it in the collection box).

5. Curriculum of practical training at pharmacy practice

The practical training goals at a pharmacy are as follows: to understand social roles and responsibilities of pharmacies and pharmacists; to participate in regional medicine, the supply and management of insurance dispensing, medicines, *etc*.; information provision, health counselling, and medical institutions and areas; to acquire basic knowledge, skills, and attitudes about relationships with society. More specifically, students' efforts are to focus on (6) below.

(1) Pharmacy items and management: Understand the role of items handled at a pharmacy, the role in health and sanitation; acquire basic knowledge and skills on their management and preservation.

(2) Access and utilisation of information: To provide information necessary for medicines' proper use, trainees should acquire basic knowledge, skills, and attitudes about drug information management at pharmacies.

(3) Practice pharmacy dispensing: To conduct pharmacy dispensing appropriately, students should acquire basic knowledge, skills, and attitudes related to dispensing, proper use of medicines, and risk management.

(4) Learn at the pharmacy counter: to understand the role of pharmacies and pharmacists in the community's health management, allow interns to acquire basic knowledge, skills, and attitudes about a client's (patient's) treatment at the pharmacy counter.

(5) Pharmacists active in the area: to understand the role of pharmacies and pharmacists in the community's health management, allow interns to acquire basic knowledge, skills, and attitudes about a (patient's) client's treatment at the pharmacy counter.

(6) Learn comprehensive pharmacy operations: to practice comprehensive pharmacist duties, for example, dispensing, medication guidance, patient/customer service, and so on.

6. Statistical methods

We used the paired *t*-test for analysing KiSS-18 total scores, consisting of 18 parameters and six sub-scale scores before and after practical training. We used the student's *t*-test to analyse differences in means for gender and total scores before and after practical training. In addition, we used IBM SPSS Statistics® 22 (SPSS Japan) for summaries and analyses of answers. The significance level was set at $p<0.05$ for all tests. Each score for each item is presented as a mean value ± standard deviation.

Results

1. Change in scores for each gender before and after practical training

To check for a similar tendency among university students as reported by Kikuchi (2007), we investigated differences in social skills between males and females before and after training. Total KiSS-18 scores before practical training were 53.7 ± 7.2 for males and 55.5 ± 11.2 for females. After practical training, scores rose to 61.6 ± 9.8 for males and 60.3 ± 11.6 for females. No significant differences in scores between men and women before training and after training (scores between male and female students before practical training, $p=0.53$; scores between male and female students after practical training, $p=0.68$ [Table III]). When we tested differences by gender in total scores before and after practical training, total scores significantly increased after practical training (male students, 7.9, 95% CI [2.31–13.44], $p=0.009$; female students, 4.7, 95% CI [2.25–7.23], $p<0.001$) (Table IV).

Table III: Comparing social skills of male and female students before and after practical

	Male Students	Female Students	*p*-value
Before Practice Training	53.7 ± 7.2	55.5 ± 11.2	0.53
After Practice Training	61.6 ± 9.8	60.3 ± 11.6	0.68

Table IV: Comparing social skills before and after practical training in each gender (paired *t*-test)

	Before Practical Training	After Practical Training	Mean Difference (95% CI)	*p*-value
Male				
Sub-scale				
Basic skill	8.0 ± 2.7	10.1 ± 2.9	2.06 (0.71 to 3.42)	0.005
Advanced skill	9.3 ± 1.3	10.8 ± 1.9	1.44 (0.37 to 2.50)	0.012
Emotional management skill	8.7 ± 1.7	9.3 ± 1.7	0.63 (-0.60 to 1.85)	0.30
Offence management skill	8.6 ± 2.2	10.0 ± 2.1	1.44 (0.45 to 2.43)	0.007
Stress management skill	9.4 ± 1.5	10.2 ± 2.2	0.81 (-0.37 to 2.00)	0.16
Planning skill	9.8 ± 1.7	11.3 ± 2.3	1.50 (0.97 to 2.90)	0.038
KiSS-Sum	53.7 ± 7.2	61.6 ± 9.8	7.88 (2.31 to 13.44)	0.009
Female				
Sub-scale				
Basic skill	8.9 ± 2.4	9.9 ± 2.8	0.97 (0.43 to 1.52)	0.001
Advanced skill	9.6 ± 2.0	10.2 ± 2.2	0.67 (0.13 to 1.20)	0.016
Emotional management skill	8.8 ± 2.1	9.7 ± 1.8	0.93 (0.46 to 1.39)	< 0.001
Offence management skill	9.2 ± 2.4	9.8 ± 2.3	0.61 (0.13 to 1.09)	0.013
Stress management skill	9.3 ± 2.4	10.2 ± 2.4	0.83 (0.22 to 1.43)	0.008
Planning skill	9.8 ± 2.3	10.5 ± 2.6	0.74 (0.17 to 1.31)	0.012
KiSS-Sum	55.5 ± 11.2	60.3 ± 11.6	4.74 (2.25 to 7.23)	< 0.001

The data above show the mean ± SD.

2. Changes in total scores and sub-scale scores before and after practical training

We analysed changes in KiSS-18 scores without differentiating between genders. Total scores were 55.2 ± 10.5 and 60.5 ± 11.3 before and after practical training, respectively, indicating significant increases after practical training (5.3, 95% CI [3.09–7.57], $p<0.001$). For the six KiSS-18 sub-scales, all scores increased significantly. The basic skill score was 1.9 points on average, showing a significant increase (Table V).

Table V. Changes in total scores and sub-scale scores before and after practical training (paired *t*-test)

	Before Practical Training	After Practical Training	Mean Difference (95%CI)	*p*-value
Sub-scale				
Basic skill	8.7 ± 2.5	9.9 ± 2.8	1.18 (0.67 to 1.68)	<0.001
Advanced skill	9.5 ± 1.9	10.3 ± 2.1	0.81 (0.34 to 1.29)	0.001
Emotional management skill	8.7 ± 2.1	9.6 ± 1.8	0.87 (0.44 to 1.30)	<0.001
Offence management skill	9.1 ± 2.4	9.8 ± 2.3	0.76 (0.34 to 1.19)	0.001
Stress management skill	9.4 ± 2.2	10.2 ± 2.3	0.82 (0.30 to 1.35)	0.003
Planning skill	9.8 ± 2.1	10.7 ± 2.5	0.88 (0.36 to 1.41)	0.001
KiSS-Sum	55.2 ± 10.5	60.5 ± 11.3	5.33 (3.09 to 7.57)	<0.001

The data above show the mean ± SD, n = 85

3. Differences in acquired social skills depending on pharmacies' management forms under health insurance

We compared increased social skills by dividing training facilities into independent and chain pharmacies based on their management as covered by health insurance. Students (n=45) who received practical training at independent pharmacies had total KiSS-18 scores of 53.4 ± 10.4 before training. Students (n=40) who received practical training at chain pharmacies had scores of 57.2 ± 10.5 before training, indicating no significant differences between type of pharmacy management before training ($p=0.99$). The total KiSS-18 scores after training were 58.5 ± 12.4 and 62.7 ± 9.5 in independent and chain pharmacies, respectively, indicating no significant differences due to type of pharmacy management after training ($p=0.87$). Changes in social skills after practical training significantly increased in both independent and chain pharmacies (independent pharmacies, 5.1, 95% CI [2.30–7.97], $p<0.001$; chain pharmacies, 5.6, 95% CI [1.88–9.22], $p=0.004$).

For sub-scale scores, four factors (Basic, Emotional management, Offence management, and Stress management skills) significantly increased in independent pharmacies (Figure 1). On the other hand, five factors (Basic, Advanced, Emotional management, Offence management, and Planning skills) significantly increased in chain pharmacies (Figure 2). For Stress management skills, significant differences were not found in chain pharmacies, whereas they were found in independent pharmacies. On the other hand, Advanced and Planning skills significantly increased in chain pharmacies compared with independent pharmacies (Table IV).

Figure 1: Comparing the six KiSS-18 sub-scales before and after practical training in independent pharmacies (n=45, paired *t*-test)

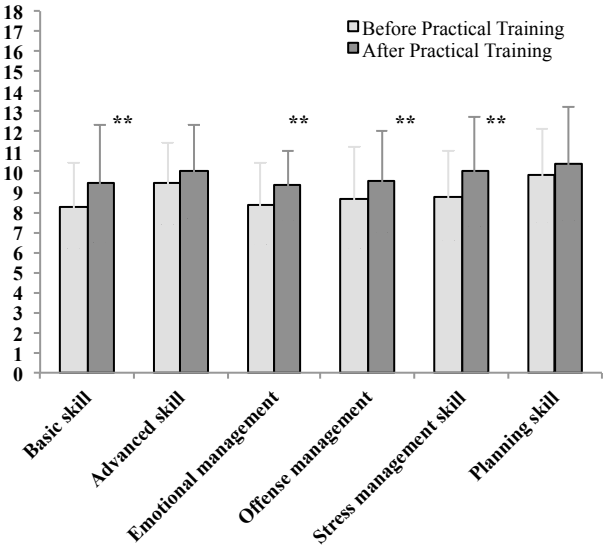

Figure 2: Comparing the six KiSS-18 sub-scales before and after practical training in chain pharmacies (n=40, paired *t*-test)

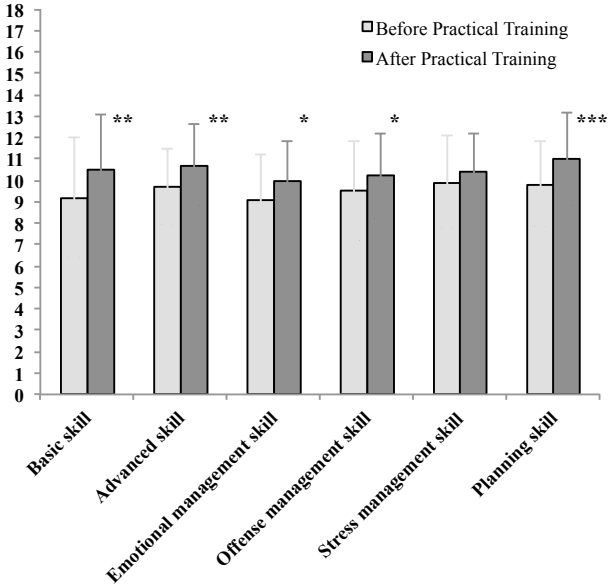

Table VI: Comparing social skills between independent and chain pharmacies involved in training students (paired *t*-test)

	Before Practical Training	After Practical Training	Mean Difference (95%CI)	*p*-value
Independent Pharmacies (n = 45)				
Sub-scale				
Basic skill	8.3 ± 2.1	9.4 ± 2.9	1.07 (0.42 to 1.72)	0.002
Advanced skill	9.4 ± 2.0	10.0 ± 2.3	0.60 (-0.09 to 1.29)	0.08
Emotional management skill	8.4 ± 2.0	9.3 ± 1.7	0.91 (0.37 to 1.45)	0.002
Offence management skill	8.7 ± 2.5	9.5 ± 2.5	0.82 (0.27 to 1.38)	0.005
Stress management skill	8.8 ± 2.2	10.0 ± 2.7	1.11 (0.40 to 1.83)	0.003
Planning skill	9.8 ± 2.3	10.4 ± 2.8	0.62 (-0.11 to 1.36)	0.10
KiSS-Sum	53.4 ± 10.4	58.5 ± 12.4	5.13 (2.30 to 7.97)	<0.001
Chain Pharmacies (n = 40)				
Sub-scale				
Basic skill	9.2 ± 2.8	10.5 ± 2.6	1.30 (0.48 to 2.12)	0.003
Advanced skill	9.7 ± 1.8	10.7 ± 1.9	1.05 (0.37 to 1.73)	0.003
Emotional management skill	9.1 ± 2.1	10.0 ± 1.8	0.82 (0.12 to 1.53)	0.023
Offence management skill	9.5 ± 2.3	10.2 ± 2.0	0.70 (0.02 to 1.38)	0.045
Stress management skill	9.9 ± 2.2	10.4 ± 1.8	0.50 (-0.31 to 1.31)	0.22
Planning skill	9.8 ± 2.0	11.0 ± 2.2	1.18 (0.40 to 1.95)	<0.001
KiSS-Sum	57.2 ± 10.5	62.7 ± 9.5	5.55 (1.88 to 9.22)	0.004

The data above show the mean ± SD.

Discussion

When we evaluated male and female students' potential differences in social skills, none were found in total scores. These results were the same as those reported by Kikuchi (2007), who rated Japanese university students' social skills by gender. In addition, when we compared changes in social skills after practical training, these skills significantly increased in both male and female students.

Kikuchi (2007) reported that total KiSS-18 mean scores were 61.8 ± 9.4 in adult males (n=45) and 60.1 ± 10.5 (n=121) in adult females; 56.4 ± 9.6 (n=83) in male university students and 58.6 ± 9.0 (n=121) in female university students; 54.0 ± 9.4 (n=45) in male high school students and 53.5 ± 9.1 (n=57) in female high school students. Our study results were 53.7 ± 7.2 (n=16) in male university students and 55.5 ± 11.2 (n=69) in female university students before practical training, indicating social skills similar to that of high school students. However, total scores after practical training significantly increased in both male and female students (male students, 61.6 ± 9.8; female students, 60.3 ± 11.6). These results revealed that the 11-week practical training at training facilities (independent and chain pharmacies) improved not only pharmaceutical knowledge, but also social skills. In addition, scores improved to the level of

adult scores reported in Kikuchi (2007). All sub-scales significantly improved, in particular Basic skills (mean difference, 1.2, 95% CI [0.67–1.68]).

In both independent and chain pharmacies, total KiSS-18 scores significantly increased according to management type in the training facility. However, sub-scale scores significantly increased in Basic, Stress management, and Offence management in independent pharmacies; in contrast Basic, Advanced, Planning, and Emotional management skills significantly increased in students from chain pharmacies. These results indicate that increased sub-scale scores depended on training facilities. For Basic and Emotional management skills, a similar increase was found in both independent and chain pharmacies. Remarkably, for Stress management skills, about a two-fold increase was found in the mean difference in independent pharmacies compared with chain pharmacies. For Advanced and Planning skills, significant differences were not found in independent pharmacies, whereas they were found in chain pharmacies. Furthermore, for Advanced and Planning skills, a two-fold increase was found in the mean difference in chain pharmacies. Generally, independent pharmacies not only have drug treatments, but also other products; therefore, trainees can acquire various types of knowledge. However, most independent pharmacies have fewer stores and pharmacists than chain pharmacies. Therefore, if the personality of the student and a teaching pharmacist clash, the student is expected to experience strong psychological stress, because there is no person to consult. In the situation where a good relationship with a teaching pharmacist cannot be established, students are likely to undergo strong psychological stress, which may contribute to improved skills in controlling emotions, such as Stress management and Offence management skills. On the other hand, chain pharmacies, education, and training systems, such as joint seminars and presentations for multiple pharmacies have been established, such systems might contribute to improving Advanced and Planning skills.

As for this research's limitations, the questionnaire was completed by students who were actually involved in pharmacy practice, so we could not randomly assign student training facilities; these were instead allocated by considering the distance between the student's home and the training facility. The study's sample size was rather small, but since students cooperated voluntarily, we could not establish a larger sample. Clearly, however, students' social skills rose after practical training, and certain ones due to differences in facilities. Furthermore, social skills rose from the high school level before practical training, beyond university student level, to the level of working people after only 11 weeks. In this regard, the results are sufficiently interesting to consider when looking at bettering pharmacy students' practice.

The results indicate that students' total social skills scores improved after practical training. Results also indicate how well pharmacy students acquire social skills depending on the pharmacy management type covered by health insurance. Since the practical training environment differs depending on training facilities, performing exactly the same training at all facilities is impossible. In countries other than Japan, many studies have been conducted on educational methods at pharmacy facilities, and flexible programmes for undergraduate pharmacy students are being developed (Cerulli *et al*., 2004; Marriott *et al*., 2005). Therefore, to conduct better practical training, further cooperation among training institutions, universities, local pharmacists' associations, and workshops exchanging techniques and opinions are necessary to achieve standardised practical training in Japan.

Conclusion

The degree of improvement varied depending on the training facility. Thus, grasping differences between training facilities and ensuring that similar appropriate practice can be administered are both necessary. This research suggests that a teaching method should be devised to instruct and guide pharmacy students at plural training facilities.

Disclosure Statements

The authors declare no conflicts of interest (including financial, personal, or other relationships) that would bias results within three years of beginning the project and writing the manuscript.

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