

# Medical Accident Prevention Education in Physical Therapy Schools in Japan

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**Abstract.** [Purpose] This study aimed to clarify the current status of physical therapy accident prevention education, and discover how safety education should be addressed at schools. [Subjects] The subjects of this study were 208 people holding positions in schools with a physical therapy program. [Methods] This study was conducted through an anonymous self-administered postal questionnaire. The details of the survey covered six categories including curriculum and collaboration with clinical training institutes. [Results] Regarding current curriculum, 77.3% of schools had a description relating to physical therapy accident prevention in their aims and objectives for clinical training and 54.7% indicated a need to improve teaching content so that it is arranged consistently. Regarding collaboration with clinical training institutes, 7.6% undertook collaborative initiatives in accident prevention education, 34% had opportunities for discussion, and 68.6% had arrangements in place for dealing with accidents. [Conclusion] It is evident that physical therapy schools are lagging behind in medical safety education. With regard to the future of safety education, there are expectations for the establishment of attainment objectives for graduation and consistency in teaching under a specific view, suggesting that awareness of physical therapy accident prevention education will rise.

**Key words:** Questionnaire, Physical therapy schools, Medical accident prevention education

*(This article was submitted Sep. 3, 2010, and was accepted Oct. 18, 2010)*

## INTRODUCTION

Amid remarkable transitions in medicine in Japan, there have been calls stressing the importance of risk management to ensure safety. The subject of medical accidents has become a serious social issue in Japan since around 1990, and with the public's unease toward and distrust of medical care having risen, the Ministry of Health, Labour and Welfare made 2001 the "Patient Safety Promotion Year" and promoted various medical safety measures primarily to prevent the occurrence and recurrence of medical accidents.

Compared to the many reports on medical accidents in relation to the work of doctors and nurses, such reports in the area of rehabilitation are relatively few. However, there are obvious risks in rehabilitation practice, including physical therapy (PT) which requires direct touching of a patient's body during active and passive movement. Many medical accidents occur in the field of PT – which is tasked with the objective of promoting the health of citizens – and preventive measures have been much discussed. In a questionnaire conducted by Yamashita et al.<sup>1)</sup> which surveyed 66 physical therapists from 24 medical institutions in the city of Kobe in 1994, 30% responded that they had

caused a medical accident (including near-miss incidents) in the past, and it was evident that the number of accidents that occurred was high for those who had limited clinical experience. Also, Mitani<sup>2)</sup> stated that from April 2003 to September 2009 there were 15 accidents and 45 incidents at the physical therapy department of his institution. Sumiya et al.<sup>3)</sup> reported that during rehabilitation at their institution in 2007 there were 735 incidents. Also, Arai<sup>4)</sup> reported that 97% of rehabilitation staff had felt a sense of danger or unease during rehabilitation training at his institution. In the light of such a steady flow of reports on medical accidents occurring on the medical frontline where many physical therapists work, there are calls for the improvement of patient safety and the quality of medical care at medical institutions, with great effort being put into medical accident prevention<sup>5-8)</sup>.

Physical therapy has had a clear place in Japan's medical system in the past 45 years, and varying points of view on the purpose and function of PT schools have been debated in-line with changes throughout this period. In 1999, the Ministry of Health, Labour and Welfare modified the regulations that specified course names and hours for each course, so that they now only specify the fields of study,

subject matter, and number of credits. This so called “relaxing of regulations” guarantees a degree of freedom for each school, and supports the creation of schools with their own distinctive character<sup>9)</sup>. Under these current requirements, discussions continue as to how the education of physical therapists should be conducted. Within the PT curriculum, heavy emphasis has been put on clinical training in particular, and many hours (810 or more) have been assigned to it by Ministry regulations<sup>9)</sup>.

Uchiyama et al.<sup>10)</sup> stated that with respect to the risk management ability of students during clinical training, lack of risk management ability was one of the issues raised by clinical training instructors, albeit at a low rate. Tanabe et al.<sup>11)</sup> reported that in a survey of students in the same year at a PT department there were 3 accidents and 79 incidents during clinical training. Ionaga et al.<sup>12)</sup> conducted a survey of 63 occupational therapy students following training and found that 29% of them had encountered some kind of accident. Kamimoto et al.<sup>13)</sup> reported that in a post-training survey of 27 occupational therapy students about accidents and incidents that occurred during their third year of clinical training, no students had experienced any accidents but 74.1% had experienced an incident. Under the present system of clinical training, at a time when the social roles of hospitals and medical institutes are at stake, the notion of students proceeding to clinical training without an elementary grounding in risk management is both negligent and highly risky in terms of the life and health of patients. It also exposes PT schools, patients, clinical training instructors, institutes, and the students themselves to the risk of litigation.

In a survey we conducted in 2005 of clinical training instructors<sup>14,15)</sup>, 28% responded that they had experienced accidents caused by students during clinical training, and 83% pointed out that the risk management ability of students was insufficient, highlighting problems related to the way risk management is taught at PT schools.

In fact, 99% of clinical training instructors held the view that risk management should be taught at school and during clinical training. Also, 64% were hopeful that risk management education at PT schools would improve and 44% called for risk management education during clinical training<sup>14)</sup>. Regarding the necessity of clinical training instructors teaching risk management during clinical training, a great many respondents pointed out that teaching through a real-life setting with actual patients increases the benefits and effectiveness of teaching. This suggests that clinical training instructors believe teaching the fundamentals at school and undertaking risk-related education and instruction in clinical training in real-life settings is both important and effective<sup>14)</sup>.

In this study we surveyed PT schools on how PT accident prevention education (risk management education) was undertaken, with the purpose of clarifying differences in opinion according to curriculum length, number of years teaching experience, and position or rank; in order to discover how medical accident prevention education in PT should be addressed, and what types of teaching methods are effective.

## SUBJECTS AND METHODS

The data for this study were collected using an anonymous self-administered postal questionnaire. The questionnaires were sent out to 208 schools with a physical therapy program. We used the survey form for nursing schools by Maruyama et al.<sup>16)</sup> as a guide in establishing six main survey categories.

In the first category, “current physical therapy accident prevention curriculum and areas that need improvement”, subjects were asked to specify whether or not their school had in place any of seven items provided and those which need improvement (Table 1).

Under the second category, “teaching physical therapy accident prevention (for the past and coming year)”, we established two sub-categories: “teaching content” consisting of 10 items (Table 2) and “teaching methods” consisting of 8 items (Table 3). Subjects were asked to specify the items adopted in the past year and the items they wished to adopt in the coming year (multiple responses allowed).

In the third category, “understanding accidents and incidents caused by students, methods of analysis and application”, we established three sub-categories. The first sub-category was “details recorded for the understanding of accidents” which consisted of seven items (Table 4) (multiple responses allowed). The second sub-category was titled “methods for collecting information on accidents and incidents over the past year”. Subjects were asked to choose from seven items (Table 5) (multiple responses allowed). Subjects were also asked whether or not they analyzed the data obtained and those that responded that they did analyze data were asked to specify the means of analysis from the options of “SHEL model”<sup>5,17,18)</sup>, “4M4E analysis”<sup>5,18)</sup>, and “other”. The third sub-category was “practical application”. Here, subjects were asked to select from 10 items (Table 6) how they practically apply and use analytical results in educational activities (multiple responses allowed).

The fourth category was titled “response to a student when a student causes an accident”. Subjects were asked to choose from nine items, issues the school needed to deal with if a student caused an accident (Table 7) (multiple responses allowed). The fifth category was titled “initiatives of schools and clinical training institutes for physical therapy accident prevention”. Here, we had two main questions. First, subjects were asked to respond “Yes” or “No” as to whether they undertook initiatives in collaboration with clinical training institutes for PT accident prevention. Yes responders were asked to specify the types of initiatives in place and their frequency. Second, subjects were asked to respond either “Yes” or “No” as to whether the school had opportunities to discuss accident prevention with clinical training institutes. Yes responders were asked to choose from eight items the topics discussed (Table 8) (multiple responses allowed).

The sixth category was titled “arrangements between schools and clinical training institutes for physical therapy accident prevention education”. Subjects were asked to respond either “Yes” or “No” as to whether there were any

**Table 1.** Current physical therapy accident prevention curriculum and areas that need improvement Unit = schools; (%)

Current			Need for improvement					
			Yes	No	NA	Yes	No	NA
A description relating to safety and accident prevention in the academic principles	Total	n=53	7 (13.2)	44 (83)	2 (3.8)	19 (35.8)	26 (49.1)	8 (15.1)
	4-year program	n=33	5 (15.1)	26 (78.8)	2 (6.1)	12 (36.4)	15 (45.5)	6 (18.2)
	3-year program	n=20	2 (10)	18 (90)	0 (0)	7 (35)	11 (55)	2 (10)
A description relating to PT accident prevention in the educational goals and objectives	Total	n=53	15 (28.3)	36 (67.9)	2 (3.8)	22 (41.5)	24 (45.3)	7 (13.2)
	4-year program	n=33	7 (21.2)	24 (72.7)	2 (6.1)	15 (45.5)	13 (39.4)	5 (15.2)
	3-year program	n=20	8 (40)	12 (60)	0 (0)	7 (35)	11 (55)	2 (10)
Attainment objectives for graduation relating to PT accident prevention	Total	n=53	14 (26.4)	35 (66)	4 (7.5)	26 (49.1)	18 (33.9)	9 (17)
	4-year program	n=33	6 (18.2)	24 (69.7)	4 (12.1)	17 (51.5)	10 (30.3)	6 (18.2)
	3-year program	n=20	8 (40)	12 (60)	0 (0)	9 (45)	8 (40)	3 (15)
A stand-alone course such as 'Safety in Physical Therapy' relating to PT accident prevention	Total	n=53	7 (13.2)	45 (84.9)	1 (1.9)	14 (26.4)	30 (56.6)	9 (17)
	4-year program	n=33	6 (18.2)	26 (78.8)	1 (3)	9 (27.3)	19 (57.6)	5 (15.2)
	3-year program	n=20	1 (5)	19 (95)	0 (0)	5 (25)	11 (55)	4 (20)
Teaching content relating to PT accident prevention which has been arranged to fit consistently within a specific view	Total	n=53	16 (30.2)	33 (62.3)	4 (7.5)	29 (54.7)	13 (24.5)	11 (20.8)
	4-year program	n=33	7 (21.2)	23 (69.7)	3 (9.1)	20 (60.6)	8 (24.2)	5 (15.2)
	3-year program	n=20	9 (45)	10 (50)	1 (5) p= 0.051	9 (45)	5 (25)	6 (30)
A description relating to PT accident prevention in the aims and objectives for clinical training	Total	n=53	41 (77.4)	11 (20.8)	1 (1.9)	22 (41.5)	20 (37.7)	11 (20.8)
	4-year program	n=33	25 (75.8)	7 (21.2)	1 (3)	14 (42.4)	12 (36.4)	7 (21.2)
	3-year program	n=20	16 (80)	4 (20)	0 (0)	8 (40)	8 (40)	4 (20)
Items for evaluation in relation to PT accident prevention in the clinical training assessment form	Total	n=53	39 (73.6)	13 (24.5)	1 (1.9)	17 (32.1)	23 (43.4)	13 (24.5)
	4-year program	n=33	22 (66.7)	10 (30.3)	1 (3)	13 (39.4)	13 (39.4)	7 (21.2)
	3-year program	n=20	17 (85)	3 (15)	0 (0)	4 (20)	10 (50)	6 (30)

**Table 2.** Teaching physical therapy accident prevention (for the past and coming year) Unit = schools; (%)

		Total (n=53)	4-year program (n=33)	3-year program (n=20)
A. Concept of PT accidents	Past year	30 (56.6)	17 (51.5)	13 (65)
	Coming year	20 (37.7)	15 (45.5)	5 (25)
B. Human behavior and human error	Past year	19 (35.8)	10 (30.3)	9 (45)
	Coming year	16 (30.2)	10 (30.3)	6 (30)
C. Safety-conscious culture	Past year	11 (20.8)	5 (15.2)	6 (30)
	Coming year	8 (15.1)	5 (15.2)	3 (15)
D. Methods for analyzing PT accidents	Past year	15 (28.3)	9 (27.3)	6 (30)
	Coming year	14 (26.4)	10 (30.3)	4 (20)
E. Types and structure of PT accidents	Past year	23 (43.4)	13 (39.4)	10 (50)
	Coming year	20 (37.7)	16 (48.5)	4 (20) *
F. Methods for preventing PT accidents	Past year	29 (54.7)	20 (60.6)	9 (45)
	Coming year	24 (45.3)	21 (63.6)	3 (15) *
G. Situations when PT accidents occur	Past year	19 (35.8)	8 (24.2)	11 (55) *
	Coming year	15 (28.3)	11 (33.3)	4 (20)
H. Responsibilities and scope of practice for PT in related laws and regulations	Past year	27 (50.9)	17 (51.5)	10 (50)
	Coming year	20 (37.7)	16 (48.5)	4 (20)
I. Relationships between medical accidents, work conditions and organizational structure	Past year	17 (32)	10 (30.3)	7 (35)
	Coming year	13 (24.5)	9 (27.3)	4 (20)
J. Other	Past year	3 (5.7)	0 (0)	3 (15)
	Coming year	2 (3.8)	0 (0)	2 (10)
NA	Past year			
	Coming year		8	2

\*:p<0.05

arrangements with clinical training institutes in place regarding the assignment of responsibility in the case of a student causing an accident, the manner of handling the issue, and the extent of assistance carried out. Yes responders were asked to specify the types of arrangements from five items (Table 9) (multiple responses allowed).

Subjects were also asked to describe the details of the arrangements, stating whether or not they had implemented any of 13 items (Table 10).

Finally, in order to establish subject attributes, subjects were asked to specify the type of school they were affiliated with, the parent institution, their gender, their number of

**Table 3.** Teaching methods of physical therapy accident prevention (multiple responses allowed)

	Past year	Coming year
Explanation based lectures	310	202
Technical exercises	83	3
Written examples	95	29
Role-play	62	7
Using mock patients	79	22
Group work	80	19
Clinical training	35	7
Other		

(Tallied responses for teaching method acquired from each of the 10 items in table 2)

years of teaching experience, their current rank and their number of years in that rank.

The survey took place between February 26 and March 26 2007.

The results of the questionnaire were tallied by curriculum type and descriptive statistics were performed. Cross-tabulation of items, chi-square test for independence and a chi-square goodness of fit test were performed to evaluate the presence of significant correlation or biases in the distribution. The significance level used was 5%. The statistics software SPSS11.5J was used.

As an ethical consideration, we requested that subjects provide written consent to their participation in the survey. It was also clearly stated that any data that could identify a

**Table 4.** Understanding the details of accidents and incidents caused by students over one year (multiple responses allowed)  
Unit = schools; (%)

	Total (n=53)	4-year program (n=33)	3-year program (n=20)
Number of accidents	38 (71.7)	23 (69.6)	15 (75)
Type of accident	39 (73.6)	22 (66.6)	17 (85)
Cause of accident	37 (69.8)	21 (63.6)	16 (80)
Teaching process	27 (50.9)	14 (42.4)	13 (65)
Student reaction and progression	31 (58.5)	15 (45.4)	16 (80)
Response to the clinical training institute	37 (69.8)	19 (57.5)	18 (90)
Other	7 (13.2)	6 (18.1)	1 (5)
NA	5 (9.4)	4 (12.1)	1 (5)

**Table 5.** Methods for collecting information on accidents and incidents over the past year (multiple responses allowed)  
Unit = schools; (%)

	Total (n=53)	4-year program (n=33)	3-year program (n=20)
Read summary reports of accidents and incidents	5 (9.4)	1 (3)	4 (20)
Read accident and incident reports by students	30 (56.6)	17 (51.5)	13 (65)
Hear from students directly	29 (54.7)	19 (57.6)	10 (50)
Hear from teachers	16 (30.2)	8 (24.2)	8 (40)
Hear in meetings	20 (37.7)	11 (33.3)	9 (45)
Hear from clinical training institutes or clinical training instructors	35 (66)	23 (69.7)	12 (60)
Other	3 (5.7)	1 (3)	2 (10)
NA	6 (11.3)	6 (18.2)	0 (0)

**Table 6.** Practical application and use of analytical results regarding accidents and incidents caused by students in educational activities (multiple responses allowed)  
Unit = schools; (%)

	Total (n=53)	4-year program (n=33)	3-year program (n=20)
In reviewing curriculum	4 (7.5)	1 (3)	3 (15)
In discussing the teaching content of lectures, exercises and practical training	14 (26.4)	7 (21.2)	7 (35)
In discussing the teaching method of lectures, exercises and practical training	14 (26.4)	8 (24.2)	6 (30)
In discussing the evaluation method of lectures, exercises and practical training	5 (9.4)	1 (3)	4 (20)
In reviewing clinical training instruction	16 (30.2)	5 (15.2)	11 (55)
In discussing training orientation content	33 (62.3)	19 (57.6)	14 (70)
In collaborating with clinical training instructors	25 (47.2)	14 (42.4)	11 (55)
In securing and assigning teachers	0 (0)	0 (0)	0 (0)
In selecting clinical training institutes	6 (11.3)	4 (12.1)	2 (10)
Other	6 (11.3)	2 (6)	4 (20)
NA	12 (22.6)	10 (30.3)	2 (10)

**Table 7.** Response to a student when a student causes an accident (multiple responses allowed)

	Unit = schools; (%)		
	Total (n=53)	4-year program (n=33)	3-year program (n=20)
How to continue the training of a student who caused an accident	30 (56.6)	20 (60.6)	10 (50)
How to give instructions on recording the experience in an accident report	11 (20.8)	4 (12.1)	7 (35)
How to interview a student who caused an accident	12 (22.6)	7 (21.2)	5 (25)
How to protect the privacy of a student who caused an accident	10 (18.9)	7 (21.2)	3 (15)
How to make a student accept responsibility	12 (22.6)	8 (24.2)	4 (20)
How to share accident information with fellow students	18 (34)	11 (33.3)	7 (35)
How to publicize the details	11 (20.8)	7 (21.2)	4 (20)
How to continue involvement with a student who caused an accident	19 (35.8)	15 (45.5)	4 (20)
Other	5 (9.4)	3 (9.1)	2 (10)
NA	9 (17)	8 (24.2)	1 (5)

**Table 8.** Topics discussed with clinical training institutes regarding physical therapy accident prevention education (multiple responses allowed)

	Unit = schools; (%)		
	Total (n=18)	4-year program (n=33)	3-year program (n=20)
Current PT accidents at clinical training institutes and results of analysis	6 (33.3)	2 (22.2)	4 (44.4)
Methods for PT accident prevention at clinical training institutes	5 (27.8)	1 (11.1)	4 (44.4)
Current PT accidents caused by students at the collaborating institute	6 (33.3)	2 (22.2)	4 (44.4)
Current PT accidents caused by students including ones caused at other institutes	8 (44.4)	5 (55.6)	3 (33.3)
Initiatives for PT accident prevention education at the school	7 (38.9)	4 (44.4)	2 (22.2)
Latest information on PT accident prevention and education	3 (16.7)	2 (22.2)	1 (11.1)
Individualized instruction on PT accident prevention for students involved in practical training	6 (33.3)	2 (22.2)	4 (44.4)
Other	2 (11.1)	1 (11.1)	1 (11.1)
NA	11 (61)	7 (77.8)	4 (44.4)

**Table 9.** Types of arrangements in place with clinical training institute for physical therapy accident prevention education (multiple responses allowed)

	Unit = schools; (%)		
	Total n=35	4-year program (n=33)	3-year program (n=20)
Contracts in the form of training request forms and written acceptance	22 (62.9)	11 (61.1)	11 (64.7)
Documents such as manuals that outline preventive measures and others	6 (17.1)	5 (27.8)	1 (5.9)
Training guidelines or syllabuses	24 (68.6)	14 (77.8)	9 (52.9)
Verbal agreements only	4 (11.4)	1 (5.6)	3 (17.6)
Other	1 (2.9)	1 (5.6)	0 (0)
NA	1 (2.9)	0 (0)	1 (5.9)

subject would be excluded in the analysis and release of the results, thereby assuring anonymity.

## RESULTS

Questionnaires were returned from 53 schools (25.5% response rate), and all 53 were valid (100% valid response rate). Of the 53 schools, 33 (62.3%) had 4-year programs

**Table 10.** Arrangements with clinical training institutes relating to physical therapy accident prevention education

Unit = schools; (%)

			Have	Do not have	NA
A set procedure for contact and reporting inside or outside the school when an accident occurs	Total	n=35	32 (91.4)	0 (0)	3 (8.6)
	4-year program	n=18	17 (94.4)	0 (0)	1 (5.6)
	3-year program	n=17	15 (88.2)	0 (0)	2 (11.8)
A set response to a student who causes an accident	Total	n=35	19 (54.3)	9 (25.7)	7 (20)
	4-year program	n=18	9 (50)	6 (33.3)	3 (16.7)
	3-year program	n=17	10 (58.9)	3 (17.6)	4 (23.5)
A set procedure for the handling of a student who causes an accident	Total	n=35	2 (5.7)	22 (62.9)	11 (31.4)
	4-year program	n=18	2 (11.1)	10 (55.6)	6 (33.3)
	3-year program	n=17	0 (0)	12 (70.6)	5 (29.4)
A clear way of dealing with (including an explanation) the patient who suffered the harm	Total	n=35	9 (25.7)	15 (42.9)	11 (31.4)
	4-year program	n=18	3 (16.7)	9 (50)	6 (33.3)
	3-year program	n=17	6 (35.3)	6 (35.3)	5 (29.4)
A clear way of dealing with those close to the patient involved in an accident	Total	n=35	6 (17.1)	18 (51.4)	11 (31.4)
	4-year program	n=18	2 (11.1)	10 (55.6)	6 (33.3)
	3-year program	n=17	4 (23.5)	8 (47.1)	5 (29.4)
A clear scope of responsibilities for the school and clinical training institute involved in an accident	Total	n=35	16 (45.7)	13 (37.1)	6 (17.1)
	4-year program	n=18	7 (38.9)	9 (50)	2 (11.1)
	3-year program	n=17	9 (52.9)	4 (23.5)	4 (23.5)
An arrangement to always indicate to the clinical training institute the range of techniques a student will use on patients	Total	n=35	9 (25.7)	17 (48.6)	9 (25.7)
	4-year program	n=18	5 (27.8)	9 (50)	4 (22.2)
	3-year program	n=17	4 (23.5)	8 (47.1)	5 (29.4)
An arrangement to always receive only verbal consent from the patient regarding the assigning of a student	Total	n=35	15 (42.9)	10 (28.6)	10 (28.6)
	4-year program	n=18	5 (27.8)	7 (38.9)	6 (33.3)
	3-year program	n=17	10 (58.8)	3 (17.6)	4 (23.5)*
An arrangement to always receive written consent from the patient regarding the assigning of students	Total	n=35	9 (25.7)	16 (45.7)	10 (28.6)
	4-year program	n=18	5 (27.8)	8 (44.4)	5 (27.8)
	3-year program	n=17	4 (23.5)	8 (47.1)	5 (29.4)*
An arrangement to always indicate to the patient the range of techniques the student will use on them	Total	n=35	1 (2.9)	22 (62.9)	12 (34.3)
	4-year program	n=18	1 (5.6)	11 (61.1)	6 (33.3)
	3-year program	n=17	0 (0)	11 (64.7)	6 (35.3)
An arrangement to explain to the patient their right to refuse treatment from a student	Total	n=35	11 (31.4)	12 (34.3)	12 (34.3)
	4-year program	n=18	7 (38.9)	5 (27.8)	6 (33.3)
	3-year program	n=17	4 (23.5)	7 (41.2)	6 (35.3)
A set procedure for dealing with a student injuries (e.g. suffers back pain)	Total	n=35	7 (20)	20 (57.1)	8 (22.9)
	4-year program	n=18	5 (27.8)	9 (50)	4 (22.2)
	3-year program	n=17	2 (11.8)	11 (64.7)	4 (23.5)
A set requirement for students to be covered by insurance for clinical training	Total	n=35	31 (88.6)	1 (2.9)	3 (8.6)
	4-year program	n=18	16 (88.9)	1 (5.6)	1 (5.6)
	3-year program	n=17	15 (88.2)	0 (0)	2 (11.8)

\*:p&lt;0.05

and 20 (37.7%) had 3-year programs.

In terms of the types of institutions, 10 respondents (18.9%) were affiliated with public institutions, and 43 (81.1%) with private institutions. The most common type of institution was 3-year technical schools (18 schools, 33.9%), followed by 4-year technical schools (16 schools,

30.1%). Thirty-three schools (62.3%) belonged to national, public or private universities or were technical schools with 4-year programs, and 20 (37.7%) belonged to national, public or private universities or were technical schools with 3-year programs.

Of the 53 respondents, 49 were male (92.4%) and 3 were

**Table 11.** Background of participants

Unit = people; (%)

Parent institution	National university, 4-year	5	(9.4)
	Public university, 4-year	2	(3.8)
	Private University, 4-year	9	(1.7)
	Public technical school, 4-year	1	(1.9)
	National technical school	2	(3.8)
	Private technical school, 4-year	16	(30.2)
	Private technical school, 3-year	18	(34)
Gender	Male	49	(92.4)
	Female	3	(5.7)
	Not specified	1	(1.9)
Number of years teaching experience	1–9 years	28	(52.8)
	10–19 years	14	(26.4)
	20 or more years	11	(20.8)
Current rank	Vice-principal	1	(1.9)
	Section head	5	(9.4)
	Department head	12	(22.6)
	Deputy department head	1	(1.9)
	Director of education	3	(5.7)
	Head	3	(5.7)
	Professor	11	(20.8)
	Other	17	(32.1)
Number of years in rank	1–5 years	31	(58.5)
	6–10 years	10	(18.9)
	11–15 years	3	(5.7)
	Over 15 years	2	(3.7)
	Not specified	7	(13.2)

female (5.7%). One respondent (1.9%) did not specify.

In terms of the length of teaching experience, 28 respondents (52.8%) had between 1 and 9 years teaching experience, 14 (26.4%) had between 10 and 19 years, and 11 (20.8%) had 20 or more years.

For job responsibility and rank, 36 respondents (67.9%) had curriculum supervisory responsibilities, and 31 (58.5%) had been in their current rank for between 1 and 5 years, 10 (18.9%) for 6 to 10 years, 3 (5.7%) for 11 to 15 years, and 2 (3.7%) for 15 or more years. Seven (13.2%) did not respond (Table 11).

In the first category, which examined PT accident prevention curriculum and areas that need improving, 41 schools (77.3%) specified that they had “a description relating to PT accident prevention in their aims and objectives for clinical training”, the highest Yes response rate to all of the items in this category. Following this, 39 schools (73.6%) selected “items for evaluation in relation to PT accident prevention in the clinical training assessment form”, and 16 (30.2%) selected “teaching content relating to PT accident prevention which has been arranged to fit consistently within a specific view”. The items with the lowest rate of Yes response were “a description relating to safety and accident prevention in academic principles” and “a stand-alone course such as ‘Safety in Physical Therapy’ relating to PT accident prevention” (7 schools each, 13.2%). The next lowest was the item “attainment objectives for graduation relating to PT accident prevention” (14 schools, 26.4%) (Table 1).

We examined the relationships between the item “a

description relating to safety and accident prevention in academic principles” in the first category and items in the sixth category that cover arrangements between schools and clinical training institutes (Tables 1 and 10), no significant correlations were observed. However, schools that had a description on safety and accident prevention in their academic principles or teaching objectives tended to score highly with the sixth category item “an arrangement to explain to the patient their right to refuse treatment from a student” ( $p=0.056$ ).

In examining the relationship between the item “teaching content arranged to fit consistently within a specific view” in the first category, and items in the second category, which deal with teaching content adopted in the past year (Tables 1 and 2), we found that schools with teaching content arranged in such a way conducted significantly more classes covering “concept of PT accidents” ( $p=0.012$ ), “types and structure of PT accidents” ( $p=0.046$ ), “methods for preventing PT accidents” ( $p=0.003$ ), “situations when PT accidents occur” (0.012), and “responsibilities and scope of practice for PT under related laws and regulations” ( $p=0.046$ ). No significant differences were observed in the teaching content that schools wished to adopt in the coming year.

We examined the relationship between “items for evaluation in relation to PT accident prevention in the clinical training assessment form” in the first category, and items in the second category, that dealt with teaching content adopted in the past year (Tables 1 and 2). We found that schools with items for evaluation conducted

significantly more classes covering “concept of PT accidents” ( $p=0.010$ ), “methods for preventing PT accidents” ( $p=0.014$ ), and “responsibilities and scope of practice for PT in related laws and regulations” ( $p=0.047$ ), than the other items. Meanwhile no significant difference was observed in teaching contents among schools with items for evaluation that they wished to adopt in the coming year. For schools without items for evaluation on their clinical training assessment form, the following items from the second category regarding teaching content schools wished to adopt were chosen significantly more times than the other items: “safety-conscious culture” ( $p=0.000$ ), “methods for analyzing PT accidents” ( $p=0.019$ ), and “relationships between medical accidents, work conditions and organizational structure” ( $p=0.019$ ).

In comparing 4-year and 3-year programs, the Yes response rate for five of the seven items from the first category was higher among 3-year program schools, however 4-year program schools had more Yes responses for the items “a description relating to safety and accident prevention in the academic principle” and “a stand-alone course such as Safety in Physical Therapy relating to PT accident prevention”. The item “teaching content relating to PT accident prevention which has been arranged to fit consistently within a specific view” showed the largest difference in responses between the 3-year and 4-year programs, a difference of 24 percentage points, with a higher tendency seen in 3-year programs, but the difference was not significant ( $p=0.051$ ) (Table 1).

Regarding areas that need improvement in PT accident prevention curriculum in the first category, the item with the highest Yes response was “teaching content relating to PT accident prevention which has been arranged to fit consistently within a specific view” (29 schools, 54.7%). The items with the second and third largest number of Yes responses were “attainment objectives for graduation relating to PT accident prevention” (26 schools, 49.1%), and “a description relating to PT accident prevention in the educational goals and objectives” and “a description relating to PT accident prevention in the aims and objectives for clinical training” (22 schools, 41.5%). The item with the least number of Yes responses was “a stand-alone course such as Safety in Physical Therapy relating to PT accident prevention” (14 schools, 26.4%) (Table 1).

We examined the relationship between the number of years teaching experience (less than 10 years, 10 or more years) and areas that need improvement in the curriculum (Tables 1 and 11), but no significant correlation was observed. However, in examining the relationship between the respondents rank and areas that need improvement, a significantly larger number of respondents in supervisory positions (department heads, professors, section heads, directors of education, vice-principals) selected “a description relating to safety and accident prevention in the academic principle” ( $p=0.031$ ), and “a description relating to PT accident prevention in the educational goals and objectives” ( $p=0.041$ ).

In the comparison of the 4-year and 3-year programs, the rate of Yes responses for areas that need improvement was

higher for schools with 4-year programs for every item. The biggest difference in responses between the 4-year and 3-year programs was in the need for improvement in the area of “items for evaluation in relation to PT accident prevention in the clinical training assessment form”, with a difference of 19 percentage points (Table 1).

Regarding the second category, “teaching physical therapy accident prevention (for the past and coming year)”, 30 schools (56.6%) had taught “concept of PT accidents”, 29 (54.7%) had taught “methods for preventing PT accidents”, and 27 (50.9%) had taught “responsibilities and scope of practice for PT under related laws and regulations” in the past year. Each of these was in the 50% range. The item with the lowest rate of response was “safety-conscious culture”, 11 schools (20.8%). In the coming year, 24 schools (45.3%) planned to teach “methods for preventing PT accidents”, 20 schools each (37.7%) planned to teach “concept of PT accidents”, “types and structure of PT accidents”, and “responsibilities and scope of practice for PT under related laws and regulations”. The item with the lowest rate of response was “safety-conscious culture” (8 schools, 15.1%) (Table 2).

There was no significant correlation in the relationship between the number of years teaching experience (less than 10 years, 10 or more years) and teaching content that schools wished to adopt in the coming year (Tables 2 and 11). However, in the relationship between position rank and teaching content that schools wished to adopt, respondents in supervisory positions showed a higher tendency to select “relationships between medical accidents, work conditions and organizational structure” ( $p=0.060$ ).

The percentage of schools currently teaching “methods for preventing PT accidents” and “responsibilities and scope of practice for PT under related laws and regulations” was higher among the 4-year programs than among the 3-year programs, with differences of 15.6 and 1.5 percentage points, respectively. Meanwhile, the percentage of schools currently teaching “concept of PT accidents”, “human behavior and human error”, “safety-conscious culture”, “methods for analyzing PT accidents”, “types and structure of PT accidents”, “situations when PT accidents occur”, and “relationships between medical accidents, work conditions and organizational structure” was higher among the 3-year programs than among the 4-year programs. The greatest difference was observed in “situations when PT accidents occur”, 30.8 percentage points, which was significant ( $p=0.046$ ). Regarding teaching content that schools wished to adopt in the coming year, the Yes response rate was higher among the 4-year programs than among the 3-year programs for all items, and significant differences were seen in “methods for preventing PT accidents” (48.6%,  $p=0.001$ ) and “types and structure of PT accidents” (28.5%,  $p=0.021$ ) (Table 2).

Regarding teaching methods in the second category (Table 3), the item “explanation based lectures” received the most responses, while “written examples”, “role-play”, “group work”, and “using mock patients” each received response rates of around 10%.

In the third category, “understanding the details of



accidents and incidents caused by students over one year" (Table 4), items with a response rate in the 70% range included "type of accident" (39 schools, 73.6%), "number of accidents" (38 schools, 71.7%), and "cause of accident" and "response to the clinical training institute" (37 schools each, 69.8%). Items "student reaction and progress" and "teaching process" were in the 50% range. Response rates for the items from schools with 3-year programs were higher in every case. Moreover, 90% of schools with 3-year programs selected "response to the clinical training institute".

For information collection methods (Table 5), 35 schools (66%) selected "hear from clinical training institutes or clinical training instructors", 30 schools (56.6%) selected "read accident and incident reports by students", and 29 schools (54.7%) selected "hear from students directly". About 30% of schools selected "hear in meetings" and "hear from teachers". Also, 9.4% of schools selected "read summary reports of accidents and incidents".

Seven schools (13.2%) indicated that they analyzed accidents and incidents caused by students, of which two were schools with 4-year programs and five were schools with 3-year programs. No school indicated that they use either the SHEL model or 4M4E analysis for their means of analysis, but five schools indicated that they used other means.

No significant correlation was found between the analysis of accidents or incidents and fifth category items "collaborative initiatives with institutes" and "opportunities to discuss with institutes".

The highest item of response for "practical application and use of analytical results in educational activities" was "in discussing training orientation content" (33 schools, 62.3%). This was followed by items "in collaborating with clinical training instructors", 25 schools (47.2%), and "in reviewing clinical training instruction", 16 schools (30.2%). No school selected the item "in securing and assigning teachers". Four schools (7.5%) selected the item "in reviewing curriculum", and 5 schools (9.4%) selected "in discussing the evaluation method of lectures, exercises and practical training" (Table 6).

Items with the highest response rate regarding issues for the school to deal with when a student causes an accident were "how to continue the training of a student who had caused an accident" (30 schools, 56.6%), "how to continue involvement of a student who had caused an accident" (19 schools, 35.8%), and "how to share accident information with fellow students" (18 schools, 34%). The item selected by the least number of schools was "how to protect the privacy of a student who had caused an accident" (10 schools, 18.9%) (Table 7).

Four schools responded that they undertook initiatives in collaboration with clinical training institutes for PT accident prevention education, and of these, one was a school with 4-year program and three were schools with 3-year programs. As for specific initiatives, two schools conducted lecture meetings and the other two collaborated in other ways. Each response specified that these initiatives occurred once a year.

Eighteen schools (34% of respondents) responded that they had opportunities to discuss accidents and accident prevention with clinical training institutes, of which nine were schools with 4-year programs (27.3% of 4-year program schools) and nine were schools with 3-year programs (45% of 3-year program schools). Regarding the number of times these opportunities had arisen in the past year for these 18 schools, the most common response was "once" (12 schools, 66.7%). For topics of the discussion, 8 schools (44.4%) selected the item "current PT accidents caused by students including ones caused at other institutes", 7 schools (38.9%) selected "initiatives for PT accident prevention education at the school", and 6 schools (33.3%) selected "current PT accidents at clinical training institutes and results of analysis", "current PT accidents caused by students at an institute of education", and "individualized instruction on PT accident prevention for students involved in practical training" (Table 8).

In examining the relationship between the presence or absence of opportunities to discuss PT accident prevention education with clinical training institutes and the 13 items (Table 10) of response in regard to arrangements with clinical training institutes, schools that had such opportunities responded with significantly higher rates to the items "a set procedure for contact and reporting inside or outside the school when an accident occurs" ( $p=0.013$ ) and "a set requirement for students to be covered by insurance for clinical training" ( $p=0.013$ ), than the other 11 items.

In total 35 schools (66%) specified that they had arrangements in place with clinical training institutes with regard to PT accident prevention. The breakdown was 18 4-year program schools (54.4% of 4-year program schools) and 17 3-year programs (85% of 3-year program schools), with a significant difference between them ( $p=0.037$ ).

In terms of the types of arrangements in place, the most frequent item of response was "training guidelines or syllabuses" (24 schools, 68.6%). This was followed by "contracts in the form of training request forms and written acceptance" (22 schools, 62.9%). The rate of response for the item "training guidelines or syllabuses" was higher for schools with 4-year programs than for schools with 3-year programs. For the item "contracts in the form of training request forms and written acceptance", schools with 3-year programs had a slightly higher rate of response (Table 9).

For the 35 schools that had arrangements with clinical training institutes in place, the most common of the 13 items of response in regard to the details of the arrangements was "a set procedure for contact and reporting inside or outside the school when an accident occurs" (33 schools, 94.3%). Following this was "a set requirement for students to be covered by insurance for clinical training", (31 schools, 88.6%), and "a set response to a student who causes an accident" (19 schools, 54.3%). Ten of the 13 items had a response rate of less than 50%. Those items with the lowest rates of response included "an arrangement to always indicate to the patient the range of techniques the student will use on them" (1 school, 2.9%), "a set procedure for the handling of a student who causes an accident" (2 schools, 5.7%), and "a clear way of dealing with those close to a

patient involved in an accident" (6 schools, 17.1%) (Table 10). The item for which significant correlation was observed with curriculum length was "an arrangement to always receive only verbal consent from the patient regarding the assigning of a student", selected by more schools with 3-year programs, with a difference of 29.1 percentage points ( $p=0.042$ ).

In examining the relationship between the presence or absence of arrangements with clinical training institutes when a student causes an accident, and the 13 items of response in regard to accident prevention-related arrangements with clinical training institutes, we found that schools that had arrangements had a significantly higher rate of responses for items "a set procedure for contact and reporting inside or outside the school when an accident occurs" ( $p=0.000$ ) and "a set requirement for students to be covered by insurance for clinical training" ( $p=0.000$ ), than the other items.

## DISCUSSION

In terms of the current status of physical therapy accident prevention curriculum, although "objectives" and "items for evaluation" in clinical training were prevalent among the responses, there was still a noted lack of set, stand-alone courses.

Our previous study showed that clinical training instructors perceived PT risk management ability as one of the necessary skills for physical therapists<sup>14)</sup>. However in this survey directed at PT schools which investigated how matters relating to PT accident prevention are positioned and set forth in schools' curriculum, only 13.2% of schools revealed that they had a stand-alone course on PT accident prevention. This indicates that PT accident prevention is not clearly positioned in the curriculum of PT schools. A survey by Fuse<sup>19)</sup> (March 2009) on medical safety education regarding revisions in 2009 to the regulations concerning educational institutions for public health nurses, midwives, and registered nurses reported that 42.5% of such schools had established safety related courses prior to the revision of the curriculum. Considering this, it seems evident that physical therapy schools are lagging in their efforts on safety education.

On the other hand, items with a high number of responses regarding the current PT accident prevention curriculum were those relating to clinical training: "a description relating to PT accident prevention in the aims and objectives for clinical training" and "items for evaluation in relation to PT accident prevention in the clinical training assessment form", each in the 70% range. These schools teach "the concept of PT accident prevention", "methods for preventing accidents in PT", and "related laws and regulations" in their curriculum, and we found that they carry out some form of teaching related to clinical training evaluation.

In total, 37.5% of schools specified the presence of PT accident prevention related items in their current curriculum, whereas 40.2% of schools indicated some sort of need for improvement. Respondents in supervisory

positions in particular felt there was a need to include clear descriptions on safety and accident prevention in academic principles and descriptions on PT accident prevention in educational goals and objectives. There was also a high rate of response by respondents from schools with 4-year programs about the need for curriculum improvement. Moreover, there was a high overall rate of response to the need for establishing attainment objectives for graduation relating to PT accident prevention and having the teaching content of PT accident prevention arranged to fit consistently within a specific view. These facts suggest that awareness of PT accident prevention education will increase in the future. Accordingly, we anticipate that PT safety education will be clearly placed and stated in curriculums, with teaching content arranged consistently. We also anticipate that students will be aware of safety-related learning objectives, and teachers will be able to develop their teaching through clear objectives.

In regard to the teaching of PT accident prevention, although the three items "concept of PT accidents", "methods for preventing PT accidents" and "responsibilities and scope of practice for PT under related laws and regulations" ranked at the top of responses, they were only in the 50% range. This, coupled with the fact that only 35.7% of schools had PT accident prevention related content in their curriculum, indicates a low level of acknowledgement of safety education.

Regarding the program length, there was a higher rate of response by 3-year programs in seven of the nine items relating to teaching PT accident prevention, which indicates that, while the length of study is shorter, such schools are more proactive in their efforts. In regard to schools' intentions for future adoption of teaching content, the rate of response by 4-year programs was higher for every item, and it was particularly evident that such schools were seeking to teach about the types and structure of PT accidents and methods for preventing PT accidents. Also, from the fact that respondents in supervisory positions gave consideration to adopting teaching content concerning the relationships between medical accidents, work conditions and organizational structure, it seems highly likely that PT schools will approach the standard set by nursing schools, who lead the way in their curricula regarding safety education for medical related occupations.

Many respondents expressed a desire for their schools to adopt consistent teaching content in regard to PT accident prevention, but for schools that responded that they already had this in place, "concept of PT accidents", "types and structure of accidents", "situations when PT accidents occur", "methods for prevention", and "responsibilities and scope of practice for PT" were also being taught. It would therefore seem that there may be a need for PT accident prevention education to be consistently arranged into the curriculum within a specific view.

Teaching methods were centered on explanation based lectures, and it appears that the development of effective teaching methods that incorporate simulation or group work is needed. Maruyama<sup>20)</sup> stated that simulation-based learning methods in nursing safety education were effective,

because nursing students who used such methods in their studies had a sense for detecting hidden causes of accidents in the practical learning environment and were able to deal with and control such problems to ensure that accidents did not occur. Haskvitz LM et al.<sup>21)</sup> also reported that curricula that made use of simulation-based teaching enhanced student learning and maintained safety in patient care. It was reported in the survey conducted by Fuse<sup>19)</sup> on the methods of teaching medical safety at nursing schools that lectures and exercises accounted for approximately half of the course work, and that the respondents felt that it was difficult to sufficiently raise the effect level of medical safety related education when teaching was conducted only through lectures. Considering this, teaching methods for effective PT safety education that incorporate simulation and group work should also be developed.

It was observed that schools with 3-year programs were more proactive in their efforts toward information gathering, analysis and practical application in regard to cases when a student caused an accident or incident in clinical training. In particular, the rate of 3-year schools was high in responding to clinical training institutes, and it would appear that such schools give careful consideration to training institutes. For information collection methods, many schools heard from the clinical training institute or student, or took their data from student accident and incident reports, but few took reports from teachers or meetings. It was indicated that medical accidents that occur during clinical training were not examined in a systematic fashion within schools. This is also shown by the fact that only 9.4% of schools read summary reports of accidents and incidents.

Only 13.5% of schools analyzed accidents and incidents, and awareness in this regard appeared low in comparison to the figure of 32.8% for nursing schools as reported in the survey by Maruyama et al.<sup>16)</sup>

Examination of the practical application and use of information and analytical results of student-caused accidents and incidents in teaching activities showed that at present such practical application is limited to discussing training orientation content and collaborating with clinical training instructors, and that there was little feedback from reviews of curriculum, teaching content, teaching methods, and evaluation methods. It is likely that factors for this lack of feedback are that there are very few schools that carry out analysis and that none make use of analytical methods such as the SHEL model.

When a student causes an accident, an immediate response to the patient, family or clinical training institute is required, but there also needs to be adequate consideration of the response to the student who caused the accident. This can also be attested by the fact that, in our survey of clinical training instructors<sup>14)</sup>, 22.8% were of the view that there is a need for clinical training instructors to teach risk management during clinical training because when a student causes an accident they may be demoralized by the shock.

Since 2007 under the instruction of the Office for University Chartering and the Medical Education Division within the Ministry of Education, Culture, Sports, Science and Technology, schools have had to detail their efforts for

personal information protection and accident prevention within the practical training plan section of the PT school curriculum establishment documentation. This makes us feel there is a strong need for further discussion on courses relating to medical safety in PT education.

Students in clinical training integrate their knowledge and skills and learn through their own experiences. For this reason, clinical training should be distinctly placed in PT accident prevention education to allow for systematic learning. This means that constant efforts are required by schools and clinical training institutes for mutual understanding in PT accident prevention education.

Arrangements between schools and clinical training institutes for PT accident prevention education are necessary, primarily to respect the rights of patients and students, and also to ensure the safety of patients in the case that an accident or incident occurs. They should also be put in place to allow quick action to be taken in the event of an accident, and moreover to clarify the responsibility of clinical training institutes, clinical training instructors, teachers and students. In this survey 66% of respondents specified that their school had arrangements with clinical training institutes in place, of which many were schools where these arrangements were through documentation: 65.7% specified "training guidelines or syllabuses", and 62.9% specified "contracts in the form of training request forms and written acceptance".

Responses to the 13 items put forward on details of arrangements varied considerably from 2.9% to 94.3%, and arrangements such as "indicating to the patient the range of techniques the student will use", "having a set procedure for the handling of a student who causes an accident", "having a clear way of dealing with those close to the patient involved in an accident", and "having a set procedure for dealing with a student injury" received low responses. This appears to indicate a difference in acknowledgement of arrangements among schools, and also shows that protective measures for the patient, who is of top priority in a clinical setting, are insufficiently considered on the part of both schools and clinical training institutes and are not clearly stated in the arrangement.

Schools that discuss PT accident prevention education with clinical training institutes at their school and have arrangements with clinical training institutes on the assignment of responsibility, manner of response, and extent of assistance when a student causes an accident appear to have procedures in place for contact and reporting when an accident occurs inside or outside the school and a set requirement for insurance coverage in clinical training. However, joint initiatives were hardly undertaken at all with regard to methods and details of how schools and clinical training institutes should collaborate over PT accident prevention education, and only 34.6% of schools were involved in discussions with institutes, with many saying they only held such discussions once a year. Given this, it would be desirable for PT schools to discuss methods of collaboration with clinical training institutes. The importance of consistency in in-school teaching and clinical training is commonly acknowledged in the pre-graduate

teaching of physical therapists. Also, it seems essential that schools, who are responsible for teaching at school, and training institutes, who are responsible for clinical education, share the same goals for clinical training so each can engage with the other for student education by working together and understanding each other's position and responsibilities. Oku et al.<sup>22)</sup> stated that 40% of schools understood the system of practical training at training institutes, and, likewise, 40% of training institutes understood the system of practical training at schools. This indicates insufficient collaboration between the two sides. Factors at play in this situation may include an increase of schools and subsequent lack of training institutes and instructors, heavier work load, and diversified needs for physical therapists. These factors appear to have led to a situation where priority is given to the securing of training institutes rather than mutual understanding of the system of practical training.

Coordinated efforts to reduce medical accidents have already begun, but what should be the role of education for physical therapists in such efforts? "Safety" in the conventional education curriculum for physical therapists is perhaps not being undertaken in a systematic way. In this survey, only 30.2% of schools responded that their teaching content relating to PT accident prevention was arranged to fit consistently within a specific view, and only 13.2% had a stand-alone course. In comparing the figure of 84.2% from Onda's<sup>23)</sup> survey of nursing accident related classes at basic nursing educational institutes, it is obvious that safety education at PT schools is lagging far behind nursing schools. Even in medical and dentistry education, "safety assurance" is positioned as one of the most important fundamental elements for developing patient focused medical services, and is incorporated into the curriculum for students to acquire through their six years of education. Considering this, safety assurance should also be systematically incorporated into the PT education curriculum. Teaching content connected with "safety" should be incorporated in incremental steps throughout the entire learning process, from admission to graduation. We recommend that after students take a course such as "Safety in Physical Therapy", they should undertake safety-conscious practice at school, and then proceed to clinical training.

To effectively carry out PT clinical training in the current situation, amid a process of transition in training curriculum for physical therapists, in which time spent in clinical training has been reduced and emphasis has shifted from experience-based learning to classroom learning, classroom teaching that takes into consideration clinical training must be developed.

The relaxing of the regulations concerning curriculum was a way of setting only the outline of the curriculum. Regulations establish only the curriculum framework within which schools form the content of their courses, and organize their curriculum. Leaving course formulation to the schools makes it easier for each school to develop their own distinctive characteristics. In order for physical therapists to respond to the diverse needs of society,

teaching content must be further enhanced, and improvements to the teaching curriculum for physical therapists should be discussed in keeping with the needs of society. The notions of "safety" and "security" should be included in the curriculum as a matter of course, but they should not be taught as mere knowledge or technique. Rather, students should be taught empathetic patient handling and communication skills with clinical settings in mind that are easy for the patient to understand and give a sense of security. Thus, there needs to be some sort of collaborative system constructed where students can integrate and apply knowledge and skills learnt in the classroom when learning outside the classroom.

PT schools and clinical training institutes should strive for sufficient collaboration in PT safety education, but it was indicated that there is confusion concerning not only teaching at schools but also during clinical training. Many schools rely on outside hospitals or institutions as they do not have affiliated institutes of their own at which their students may undertake clinical training. Meanwhile, hospitals and institutes where clinical training can be undertaken are limited in number and are overflowing with students. Clinical training instructors must first give top priority to the medical treatment of patients and are unable to offer instruction to students as they did previously. Considering this situation, and also other issues such as medical safety and malpractice litigation, we must think of new approaches to clinical training.

It is well acknowledged that teaching nursing students only the principles and basics of nursing in their fundamental education and then allowing them to go on to learn advanced applications on-the-job after graduation results in novice nurses who lack the knowledge and awareness required for accident prevention. Therefore, accident prevention education through lectures and practical exercises must be taught from the initial stages of nursing education. Kayashima<sup>24)</sup> stated that when students undertake practical exercises they must also learn from the aspects of accident prevention and safety awareness. Accordingly, if accident prevention or countermeasures are not taught during the course of fundamental education and clinical training, there is a very high possibility that medical accidents will occur in clinical training or at the place of work after graduation. This goes to show that medical accidents usually associated with doctors and nurses are by no means just "other people's problems".

Due to the low response rate, the conclusions of this study are limited in that we cannot make generalizations regarding the current situation and initiatives undertaken for medical accident prevention education at PT schools in Japan. Medical accident prevention education was more actively undertaken at schools with 3-year programs. However, it was insufficient in schools with 4-year programs despite their longer and more flexible curriculums and greater hopes for the future adoption of initiatives. These issues need to be addressed now. In striving for a change in curriculum design, it is important that teachers at PT schools have the ability to incorporate PT accident prevention education into the curriculum, the planning and management ability to

realize a teaching plan, and the ability to collaborate with clinical training institutes. We would like to address these issues in a future study.

# REFERENCES

- 1) Yamashita T, Koeda H, Nagai H, et al.: Questionnaire survey about the medical accident in the Higashikobe block. 8th Hyogo physical therapist society program / abstracts, 1995: 26 (in Japanese).
- 2) Mitani Y, Okuyama M, Ito T, et al.: Medical accident / Hiyarihatto analysis in this hospital physiotherapy department. Rigaku ryohogaku, 2010, 37: 1159 (in Japanese).
- 3) Sumiya K, Kinoda N, Tomaru T: Relations of the outbreak situation of the incident according to the level in this hospital rehabilitation part. A collection of 2008 rehabilitation care combination study meet Fukui abstracts, 2008: 218 (in Japanese).
- 4) Arai S: Consciousness investigation about the risk management of the rehabilitation staff. A collection of 2008 rehabilitation care combination study meet Fukui abstracts, 2008: 219 (in Japanese).
- 5) Watanabe K: Risk management in this hospital physiotherapy section (1). Japanese Journal of Physical Therapy, 2001, 35: 706–710 (in Japanese).
- 6) Taniuchi Y: Risk management in this hospital physiotherapy section (2). Japanese Journal of Physical Therapy, 2001, 35: 711–714 (in Japanese).
- 7) Hanaoka T, Kurihara K, Himukai Y, et al.: Risk management in this hospital physiotherapy section (3). Japanese Journal of Physical Therapy, 2001, 35: 715–719 (in Japanese).
- 8) Fujitani N: Risk management in this hospital physiotherapy section (4). Japanese Journal of Physical Therapy, 2001, 35: 720–723 (in Japanese).
- 9) Association of Japanese physical therapist editing: White paper on physical therapy 2000, Japan: Japanese Physical Therapy Association, 2000, pp43–44 (in Japanese).
- 10) Uchiyama Y, Yamaji T: The curriculum which raises ability for practice in the physiotherapy education. Japanese Journal of Physical Therapy, 2005, 39: 119–129 (in Japanese).
- 11) Tanabe Y, Ogishima H, Nakashima T, et al.: Fact-finding about the accident that a student experienced during training and the incident. Rigaku ryohogaku, 2004, 31: 307 (in Japanese).
- 12) Ionaga S, Fujisue F, Nara N, et al.: A report on incident events in clinical education. Rehabilitation Kyoiku Kenkyu, 2002, 7: 37–39 (in Japanese).
- 13) Kamimoto T, Ishida K, Shimamoto Y, et al.: Medical accidents by occupational therapy students in clinical practice –Students questionnaire–. Rehabilitation Kyoiku Kenkyu, 2002, 7: 35–36 (in Japanese).
- 14) Koeda H, Satouchi Y, Naruse S, et al.: Education for risk management at the physical therapy training college –From the questionnaire to supervisors–. Journal of Kansai Rehabilitation College, 2008, 1: 37–42 (in Japanese).
- 15) Koeda H, Oka H, Satouchi Y, et al.: About physiotherapy safety education –Than questionnaire survey to the clinical training leader–. 8th Hyogo general rehabilitation care study meet abstracts, 2007: 60 (in Japanese).
- 16) Maruyama M, Iwamoto I, Waga T, et al.: A study about the development of the education method for prevention of accident in nursing / the medical care, 2003 public welfare labor science research funds subsidy business medical technology evaluation synthesis study business 2003 report, 2004 (in Japanese).
- 17) Takeuchi N, Kuwahara T, Kimura T, et al.: The accident factor analysis that I used an SHEL model for –An action in this Hospital physiotherapy section. Japanese Journal of Physical Therapy, 2008, 42: 167–171 (in Japanese).
- 18) Sugimoto M: Risk Management of Physical Modalities. Rigaku ryoho, 2001, 18: 593–605 (in Japanese).
- 19) Fuse J: How to lead medical safety education to bring up the risk sensitivity of the student. Kango jinzai kyoiku, 2009, 6: 86–94 (in Japanese).
- 20) Maruyama M, Iwamoto I, Waga T, et al.: A study about the development of the education method for prevention of accident in nursing / the medical care. 2002 public welfare labor science research funds subsidy business report, 2003 (in Japanese).
- 21) Haskvitz LM, Koop EC: Students struggling in clinical? A new role for the patient simulator. J Nurs Educ, 2004, 43: 459–464.
- 22) Oku T, Takada H, Eguchi H: A survey of mutual understanding about the clinical practice at the physical therapy school between teachers and supervisors at hospitals. Journal of Clinical Welfare, 2004, 1: 51–55 (in Japanese).
- 23) Onda K: How to lead medical safety education to bring up the risk sensitivity of the student. Journal of Japan Society of Nursing Research, 1998, 21: 214 (in Japanese).
- 24) Kayashima Y: Examination of the prevention of accident education in the nursing basic education. Kango kyoiku, 2004, 45: 175–180 (in Japanese).