

# Physical Therapists' Experience in House Adaptation

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**Abstract.** [Purpose] The important role of physical therapists in house adaptation has been reported in studies in the fields of architecture, care and welfare. However, to date few studies regarding this have been conducted by physical or occupational therapists. The purpose of this study was to clarify the role of physical therapists in house adaptation. [Subjects] The target study group was 714 physical therapists belonging to the Physical Therapist Society of Gunma Prefecture (fiscal 2009). [Methods] The subjects were asked to complete a survey questionnaire to identify their present activities in, and awareness of, house adaptation. The study was conducted over a two-month period from June 2009, within which time 37.4% responded. [Results] Of the therapists who responded, 70.1% had experience with house adaptation. In house adaptation, physical therapists emphasized the importance of activities of daily living (ADL) in various areas of the house. [Conclusion] Although collaboration between physical and occupational therapists in house adaptation has tended to increase, the difference in the roles of these two specialists needs to be examined in future studies.

**Key words:** Role, Specialty, Collaboration

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## INTRODUCTION

House adaptation for individuals with physical challenges implies not only support that involves construction work, but also support in the development of plans for house adaptation before the remodeling of a house, and confirmation and guidance for actions and activities of daily living (ADL) after remodeling the house<sup>1, 2)</sup>. All processes presented in Fig. 1<sup>2)</sup> were performed with the purpose of improving home-life after home renovation. The importance of the role of the physical therapist (PT) in the process of house remodeling has been reported in previous studies<sup>3-5)</sup>. In 1990, Nomura et al.<sup>6)</sup> conducted a large-scale study to ascertain the involvement of 1,105 PTs, about 15% of the registered PTs at that time, in house adaptation. However, the social situation has changed since then, as represented by increased needs for community dwelling and the commencement of the Long-Term Care Insurance in 2000, and the social needs for PTs in house adaptation have also changed. Academic subjects related to house adaptation were added to the educational curriculum of PTs in 1989<sup>NOTE 1)</sup>. Since the research conducted by Nomura et al., no survey on an equivalent scale has been conducted, although there have been several changes in the practice of house adaptations. Furthermore, it has been noted that academic research by PTs related to the role of house adaptation is scarce<sup>7)</sup>.

To provide an aid for summarizing the role of PTs in house adaptation, this report describes the questionnaire study we conducted to identify the actual involvement of PTs and their awareness of house adaptation.

## SUBJECTS AND METHODS

All PTs who belong to the Gunma Physical Therapy Association were sent this questionnaire over a two-month period beginning in June 2009. The author of this paper distributed the survey questionnaire and explained the purpose of this study to the study subjects. Of the 714 survey forms posted, 268 PTs returned the questionnaire by mail or Fax (response rate, 37.4%). Respondents were divided into two groups on the basis of their experience with house adaptation, and their data was compared and analyzed by cross tabulation.

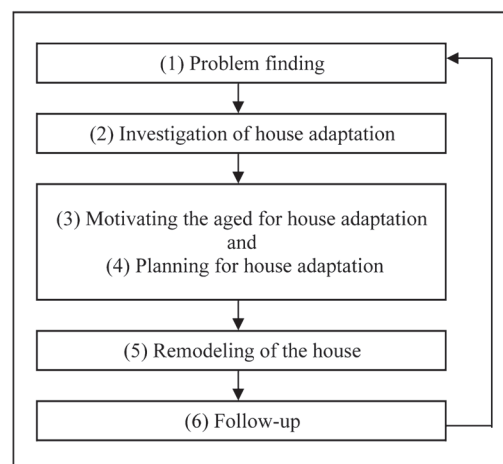


Fig. 1. A process for House Adaptation<sup>2)</sup>

**Table 1.** Number of years of experience of PT

	Less than 1 year	More than 1 year but less than 3 years	More than 3 years but less than 5 years	More than 5 years but less than 10 years	More than 10 years but less than 15 years	More than 15 years	Unknown	Average (years)
Total (n=268)	5 (1.9)	56 (20.9)	78 (29.1)	57 (21.3)	28 (10.4)	40 (14.9)	4 (1.5)	7.4 ± 7.4
Experienced group (n=188)	0 (0.0)	30 (16.0)	58 (30.9)	44 (23.4)	21 (11.2)	32 (17.0)	3 (1.6)	7.8 ± 6.8
No experienced group (n=80)	5 (6.3)	26 (32.5)	20 (25.0)	13 (16.3)	7 (8.8)	8 (10.0)	1 (1.3)	6.3 ± 8.6

Unit: Upper figure shows number of people; the lower panel shows %

## RESULTS

Of the PTs who responded to the survey, 70.1% had experience with house adaptation (hereinafter designated as the Experienced group). The remaining 29.9% had no experience with house adaptation (Inexperienced group). Regarding the years of overall experience as a PT, the proportion of PTs with “more than 3 years but less than 5 years” experience was the highest in the Experienced group (30.9%), whereas the number of PTs with “more than 1 year but less than 3 years” experience was higher in the Inexperienced group (32.5%) (Table 1). The average number of years of experience was 7.8±6.8 years in the Experienced group and 6.3±8.6 years in the Inexperienced group. Regarding the reason for the Inexperienced group members’ relative lack of involvement in house adaptation, the proportion of “no subjects for house adaptation” was the highest (73.8%) among the responses (Table 2).

In terms of place of work, the numbers of respondents in the Experienced group and Inexperienced group working in a “Hospital” (68.1% for the former, 63.8% for the latter) and “Long-Term Care Health Facility” (11.7% for the former, 8.8% for the latter) were high (Table 3).

In the Experienced group, the numbers of subjects in the different stages of recovery were 23.4% in the acute stage, 33.0% in the convalescent stage and 22.3% in the chronic stage, which were not statistically significantly different from each other. In the Inexperienced group, the PTs tended to work with acute stage patients (41.3%) (Table 4).

Questions about the types of support for house adaptation provided by the Experienced group showed that “Problem finding in home-life” (96.3%), “Confirmation of housing” (91.5%), and “Motivating the subjects for house adaptation” (73.4%), which are issues that need addressing before remodeling of the house, were the areas with which the PTs had greatest experience. The percentage of PTs involved only in support before the remodeling of the house (hereinafter designated as the Pre group) was 36.7%. Among PTs who provided inputs both before and after remodeling of the house, the ratio of those who performed monitoring and follow-up of “Confirmation and guidance of actions and ADL” (55.3%) and “Confirmation of utilization status” (41.5%) of the house (hereinafter designated as the All group) was 63.3% (Table 5).

The proportion of PTs involved in “Changes in actions and ADL” was highest in the Experienced group (including

**Table 2.** Reasons for no experience with house adaptation

(multiple answers)		
	Total (number of people)	Ratio (%)
Total	80	
No target patient for house adaptation	59	(73.8)
Poor knowledge about the house adaptation system	19	(23.8)
Poor knowledge about the home renovation	16	(20.0)
Unable to be involved during office hours	16	(20.0)
Not permitted as a job duty	10	(12.5)
Poorly paid	2	(2.5)
No other profession to cooperate	2	(2.5)
Not accepted by target patient and family	1	(1.3)
Others	5	(6.3)
Details unknown	3	(3.8)

(n=80)

the All and Pre groups), the largest proportion of them being for judgment of effects of house adaptation (32.8% for the former, 24.6% for the latter). The proportion of PTs in the Inexperienced group involved in “Changes in actions and ADL” (40.0%) was also higher than in other areas of house adaptation, most of this being for judgment about the effects of house adaptation (Table 6).

Table 7 shows the significance of intervention of the PT in house adaptation. In the All group and the Pre group, the respective shares of “Confirmation of actions” (95.0% in the former, 92.8% in the latter) and “Problem finding in home-life” (93.3% in the former, 95.7% in the latter) were high before remodeling of the house. The respective shares of “Confirmation of actions” (87.5%) and “Problem finding in home-life” (91.3%) were high in the Inexperienced group before home remodeling.

In terms of intervention after remodeling of the house, the ratio of “Confirmation and guidance of actions and ADL” was the second highest after the two above-described items in the All group (83.2%) and the Inexperienced group (73.8%) (Table 7).

In the Experienced group, more PTs had collaborated with “Long-Term Care Support Specialists” (91.6% in the All group, 78.3% in the Pre group) and “Occupational therapists” (OTs) (77.3% in the All group, 78.3% in the Pre group). In terms of architectural professionals, collaboration with the “Builder’s office” (42.9% in the All group, 37.7% in the Pre group) and “Carpenter” (47.1% in the All group, 26.1% in the Pre group) was most common (Table 8).

**Table 3.** Place of work

	Hospital	Long-Term Care Health Facility	Clinic	Home nursing station	Educational institution	Administrative agency	Others	Details unknown
Total (n=268)	179 (66.8)	29 (10.8)	27 (10.1)	12 (4.5)	1 (0.4)	10 (3.7)	6 (2.2)	4 (1.5)
Experienced group (n=188)	128 (68.1)	22 (11.7)	15 (8.0)	9 (4.8)	1 (0.5)	6 (3.2)	3 (1.6)	4 (2.1)
No experienced group (n=80)	51 (63.8)	7 (8.8)	12 (15.0)	3 (3.8)	0 (0.0)	4 (5.0)	3 (3.8)	0 (0.0)

Unit: Upper figure shows the number of people; the lower panel shows %

**Table 4.** Main target patients in job execution

	Acute stage	Convalescent stage	Chronic stage	Home-care patient	Training school student	Child	Others	Unknown
Total (n=268)	77 (28.7)	76 (28.4)	55 (20.5)	38 (14.2)	9 (3.4)	4 (1.5)	5 (1.9)	4 (1.5)
Experienced group (n=188)	44 (23.4)	62 (33.0)	42 (22.3)	29 (15.4)	6 (3.2)	1 (0.5)	3 (1.6)	1 (0.5)
No experienced group (n=80)	33 (41.3)	14 (17.5)	13 (16.3)	9 (11.3)	3 (3.8)	3 (3.8)	2 (2.5)	3 (3.8)

Unit: Upper figure shows number of people; the lower panel shows %

**Table 5.** Supports related to house adaptation (multiple answers)

	Before the remodeling of the house					The remodeling of the house	After the remodeling of the house			Others
	Problem finding in home-life	Confirmation of house	Motivating the target patient for house adaptation	Developed plans for house adaptation	Calculation of costs		Confirmation and guidance of actions and ADL	Confirmation of utilization status	Confirmation of place of the remodeling of the house	
Total (n=188)	181 (96.3)	172 (91.5)	138 (73.4)	71 (37.8)	10 (5.3)	5 (2.7)	104 (55.3)	78 (41.5)	51 (27.1)	2 (1.1)
All group (n=119)	114 (95.8)	108 (90.8)	96 (80.7)	47 (39.5)	9 (7.6)	3 (2.5)	104 (87.4)	78 (65.5)	51 (42.9)	2 (1.7)
Pre group (n=69)	67 (56.3)	64 (53.8)	42 (35.3)	24 (20.2)	1 (0.8)	2 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Unit: Upper figure shows number of people; the lower panel shows %

**Table 6.** Items most important for judgment of effects of house adaptation

	Change in actions and ADL	Opinion of target patients	Utilization frequency	Opinion of family	Opinion of other professionals	Others	Unknown*
Total (n=268)	88 (32.8)	51 (19.0)	23 (8.6)	22 (8.2)	3 (1.1)	2 (0.8)	79 (29.5)
Experienced group (n=188)	56 (29.8)	39 (20.7)	18 (9.6)	21 (11.2)	3 (1.6)	1 (0.5)	50 (26.6)
All group (n=119)	39 (32.8)	22 (18.5)	8 (6.7)	13 (10.9)	2 (1.7)	1 (0.8)	34 (28.6)
Pre group (n=69)	17 (24.6)	17 (24.6)	10 (14.5)	8 (11.6)	1 (1.4)	0 (0.0)	16 (23.2)
No experienced group (n=80)	32 (40.0)	12 (15.0)	5 (6.3)	1 (1.3)	0 (0.0)	1 (1.3)	29 (36.3)

Unit: Upper figure shows number of people; the lower panel shows %. \*: "Unknown" includes no answer and those who presented multiple answers to single-answer questions.

Regarding cooperation with other professionals, PTs reported cooperation for the promotion of a team approach in house adaptation "Long-Term Care Support Specialists" (92.4% in the All group, 88.4% in the Pre group, 75.0% in

the Inexperienced group), "OTs" (87.4% in the All group, 85.5% in the Pre group, 80.0% in the Inexperienced group), and "PTs" (77.3% in the All group, 78.3% in the Pre group, 71.3% in the Inexperienced group) was high. With architect-

**Table 7.** Significance of intervention of PT in house adaptation (multiple answers)

	Before the remodeling of the house				The remodeling of the house	After the remodeling of the house			Adjustment of collaboration with the professionals	Others	Unknown
	Confirmation of actions	Problem finding in home-life	Motivating the target patient for house adaptation	Developed plans for house adaptation		Confirmation and guidance of actions and ADL	Confirmation of utilization status	Confirmation of place of the remodeling of the house			
Total (n=268)	247 (92.2)	250 (93.3)	125 (46.6)	158 (59.0)	16 (6.0)	198 (73.9)	158 (59.0)	61 (22.8)	39 (14.6)	5 (1.9)	2 (0.7)
Experienced group (n=188)	177 (95.7)	177 (95.7)	96 (51.9)	125 (67.6)	13 (7.0)	139 (75.1)	114 (61.6)	44 (23.8)	33 (17.8)	5 (2.7)	2 (1.1)
All group (n=119)	113 (95.0)	111 (93.3)	63 (52.9)	84 (70.6)	11 (9.2)	99 (83.2)	82 (68.9)	34 (28.6)	21 (17.6)	4 (3.4)	1 (0.8)
Pre group (n=69)	64 (92.8)	66 (95.7)	33 (47.9)	41 (59.4)	2 (2.9)	40 (58.0)	32 (46.4)	10 (14.5)	12 (17.4)	1 (1.4)	1 (1.4)
No experienced group (n=80)	70 (87.5)	73 (91.3)	29 (36.3)	33 (41.3)	3 (3.8)	59 (73.8)	44 (55.0)	17 (21.3)	6 (7.5)	0 (0.0)	0 (0.0)

Unit: Upper figure shows the number of people; the lower panel shows %

**Table 8.** Professionals once collaborated (multiple answers)

	Medical system					Architectural system			
	Occupational therapist	Physical therapist	Clinical nurse	Doctor	Public health nurse	Builder's office	Carpenter	Architect	Care goods provider
Total (n=188)	146 (77.7)	76 (40.4)	75 (39.9)	32 (17.0)	26 (13.8)	77 (41.0)	74 (39.4)	57 (30.3)	43 (22.9)
All group (n=119)	92 (77.3)	49 (41.2)	49 (41.2)	19 (16.0)	21 (17.6)	51 (42.9)	56 (47.1)	41 (34.5)	25 (21.0)
Pre group (n=69)	54 (78.3)	27 (39.1)	26 (37.7)	13 (18.8)	5 (7.2)	26 (37.7)	18 (26.1)	16 (23.2)	18 (26.1)

	Architectural system		Care system		Administrative officer	Others*	Unknown
	Housing environment coordinator for elderly and disabled people	Welfare equipment planner	Long-Term Care Support Specialists	Certified social worker			
Total (n=188)	33 (17.6)	28 (14.9)	163 (86.7)	67 (35.6)	37 (19.7)	21 (11.2)	17 (9.0)
All group (n=119)	23 (19.3)	22 (18.5)	109 (91.6)	40 (33.6)	24 (20.2)	16 (13.4)	11 (9.2)
Pre group (n=69)	10 (14.5)	6 (8.7)	54 (78.3)	27 (39.1)	13 (18.8)	5 (7.2)	6 (8.7)

Unit: Upper figure shows number of people; the lower panel shows %. \*: "Others" include those who have no experience of cooperation (one person)

tural professionals, collaborations with "Carpenter", "Architect", and "Builder's office" were at the same level (Table 9).

## DISCUSSION

For quality house adaptation, various professionals, each with a different specialty, should collaborate to form a team. Execution of the remodeling of a house is an important task, the responsibility of which is usually borne solely by architectural engineers. However, as shown in Fig. 1, professionals in the fields of medical care, welfare, and nursing can play more important supportive roles before and after the remodeling of the house than architectural engineers. To study the special role of PTs, professionals who are rehabilitation specialists, in house adaptation, here I discuss the present status and significance of intervention in house adaptation by PTs.

The results of this study indicate that the percentage of PTs with experience in house adaptation has reached 70%, which is similar to the percentage reported in a preceding study<sup>8)</sup>, which indicated 65.5%. These results demonstrate that house adaptation is not a special intervention for PTs. When the results for the Experienced and Inexperienced groups were compared, the average years of experience in the field of physiotherapy was longer in the Experienced group. Moreover, experience in house adaptation was influenced by the number of years of experience as a PT. However, because PTs who have worked for a long time have a greater variety of experiences, experience in house adaptation is regarded as just one kind of those experiences.

Regarding the main subjects, the Experienced group had intervened for a wide variety of people, such as those in the acute, convalescent and chronic stages of their illnesses, as well as home-care patients. The Inexperienced group had mostly intervened for patients in the acute stage. The acute

**Table 9.** Professionals intened for collaboration (multiple answers)

	Medical system					Architectural system			
	Occupational therapist	Physical therapist	Clinical nurse	Doctor	Public health nurse	Carpenter	Architect	Builder's office	Housing environment coordinator for elderly and disabled people
Total (n=268)	227 (84.7)	203 (75.7)	121 (45.1)	88 (32.8)	37 (13.8)	130 (48.5)	128 (47.8)	122 (45.5)	108 (40.3)
Experienced group (n=188)	163 (86.7)	146 (77.7)	90 (47.9)	60 (31.9)	31 (16.5)	103 (54.8)	94 (50.0)	94 (50.0)	73 (38.8)
All group (n=119)	104 (87.4)	92 (77.3)	63 (52.9)	40 (33.6)	25 (21.0)	68 (57.1)	62 (52.1)	62 (52.1)	50 (42.0)
Pre group (n=69)	59 (85.5)	54 (78.3)	27 (39.1)	20 (29.0)	6 (8.7)	35 (50.7)	32 (46.4)	32 (46.4)	23 (33.3)
No experienced group (n=80)	64 (80.0)	57 (71.3)	31 (38.8)	28 (35.0)	6 (7.5)	27 (33.8)	34 (42.5)	28 (35.0)	35 (43.8)
	Architectural system		Care system				Administrative officer	Others	Unknown
	Care goods provider	Welfare equipment planner	Long-Term Care Support Specialists	Welfare caretaker	Home helper	Caretaker			
Total (n=268)	78 (29.1)	62 (23.1)	231 (86.2)	94 (35.1)	92 (34.3)	89 (33.2)	29 (10.8)	7 (2.6)	7 (2.6)
Experienced group (n=188)	62 (33.0)	53 (28.2)	171 (91.0)	75 (39.9)	67 (35.6)	65 (34.6)	24 (12.8)	5 (2.7)	3 (1.6)
All group (n=119)	43 (36.1)	36 (30.3)	110 (92.4)	49 (41.2)	48 (40.3)	43 (36.1)	21 (17.6)	4 (3.4)	1 (0.8)
Pre group (n=69)	19 (27.5)	17 (24.6)	61 (88.4)	26 (37.7)	19 (27.5)	22 (31.9)	3 (4.3)	1 (1.4)	2 (2.9)
No experienced group (n=80)	16 (20.0)	9 (11.3)	60 (75.0)	19 (23.8)	25 (31.3)	24 (30.0)	5 (6.3)	2 (2.5)	4 (5.0)

Unit: Upper figure shows number of people; the lower panel shows %

stage refers to the stage immediately following diagnosis during which treatment in the priority. At this stage, it is unknown if returning home will eventually be possible. Further, it is difficult to ascertain what the future holds for patients with a cerebrovascular disease. Since institutions that handle only patients in the acute stage transfer subjects to other institutions when their clinical condition has stabilized, there are a fewer number of such patients requiring house adaptation. Accordingly, as the study results show, the most common explanation for the Inexperienced group members' lack of experience with house adaptation intervention is that no patients in their care had required house adaptation.

Previous research<sup>1,2)</sup> reported that PTs play valuable roles in the analysis and assessment of actions or ADL as part of the intervention in house adaptation. The present study revealed that both the Experienced and Inexperienced group members recognize the role of PTs in relation to action analysis of various items, including planning of house adaptation, judgment of the effects of house adaptation and the significance of the intervention of the PT in house adaptation. It is said that action analysis and assessment are "common measures which everyone performs and is at the heart of physical therapy"<sup>9)</sup> for clinical physical therapists. In other words, the special knowledge and skills that a PT brings to house adaptation are not specific to intervention in house adaptation, but are those that are routinely used in their daily clinical practice.

However, with regards to the judgment of effects of house adaptation, the Inexperienced group tended to primarily perform action analysis, whereas the Experienced group members were likely to have turned their attention to items other than actions. Possibly, when the Inexperienced group members actually intervene in home adaptation, their inexperience would become apparent. For example, they may hear the opinion of the person and family.

Experienced group members most often tended to cooperate with OTs, second only to Long-Term Care Support Specialists. Although differences in the roles of PTs and OTs in house adaptation have not been examined, previous studies<sup>3-5)</sup> have discussed their importance. Both physiotherapy and occupational therapy are rehabilitation professions that are governed by one law, designated "the Physical Therapists and Occupational Therapists Act", making these specialties common in many aspects. Furthermore, they work in environments that foster collaboration. However, expectations for OTs to be collaborative as a team in house adaptation are high, second only to Long-Term Care Support Specialists. PTs believe that the roles of PTs and OTs in house adaptation are different and that the specialty of occupational therapy is necessary for house adaptation. However, this study did not identify the details of how PTs regard the differences in these two specialties. This remains a topic for a future investigation.

In practical interventions for house adaptation, there was a tendency to emphasize items before remodeling of the

house, and the presence of a PT who intervened solely in support before the remodeling of the house was identified as the reason for this tendency. Monitoring and follow-up after remodeling of the house does not merely imply checking to ensure that remodeling has been executed in accordance with the plan. At this stage, besides confirming adequate execution of the plan, it is necessary for PTs to give guidance for actions, methods of assistance, and new lifestyles under the new environment. If the confirmation or guidance is insufficient, it can lead to a remodeled house not being used, being used incorrectly or the desired living image not being achieved. A PT with greater ability of analysis and assessment of actions and ADL can play an important role in the follow-up stage. Since undertaking this role is “directly coupled to improve the specialty of house adaptation by PTs”<sup>10)</sup>. It is said that in the follow-up stage, an “awkwardly maintained place was found in many cases while giving guidance for actions after the remodeling of the house”<sup>10)</sup>. However, since the Pre group did not intervene in the stage after remodeling of the house, they had no feedback about the results of house adaptation and living conditions under the new environments from the subjects and family. This lack of feedback limits the ability of the Pre group PTs to improve their skills, which may further widen the gap between the ability of the Pre group and All group in house adaptation.

In this study, which was undertaken to obtain data for use as an aid to discuss the specialty of PT in house adaptation, I performed an investigation of the current activities of PTs in, and their awareness of, house adaptation. However, this report did not identify some aspects of the background, specialty, and roles specific to PTs and OTs, which are handled in parallel. Therefore, the results underscore the importance of these specialties and suggest areas that must be studied in the future as new

research topics.

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