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Factors influencing the planning of home-based rehabilitation services by care managers

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ABSTRACT

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Purpose: To describe the planning of home-based rehabilitation (HBR) by care managers and to show the relationship between the knowledge/understanding of the care managers regarding HBR and their planning experience regarding these services.

Methods: Five hundred certified care managers in the Miyagi Care Manager Association completed a questionnaire that included queries on the participants' knowledge/understanding of HBR and on their experiences in selecting HBR in their care plans. Factors affecting selection of HBR were explored with the chi-square test, followed by logistic regression analysis.

Results: Among 113 care managers who are currently engaged in home-based care, 78 (69%) have experience with HBR. The planning of HBR was affected by the availability of facilities that offer HBR and the knowledge/understanding of care managers.

Conclusion: The knowledge/understanding of HBR by the care manager is important to provide the HBR service.

Key words: long-term care, care manager, home-based rehabilitation

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Introduction

Japan has one of the most rapidly aging societies in the world. In order to accommodate the rapidly growing elderly population, Japan established a long-term care insurance (LTCI) system in 2000 [1, 2]. In 2006, the LTCI was revised to include preventive efforts that focus on keeping the elderly from requiring nursing care, or keeping their condition stable, in addition to assisting elderly people already requiring assistance and nursing care [3−5]. In the LTCI system, the "care manager" plays an important role. Before starting a new long-term care service, the care manager assesses the condition of the client and the client's family. Throughout the long-term care service period, the care manager manages the necessary services and benefits, offers advice to the client, and revises the service plan as necessary.

The LTCI program includes home-based rehabilitation (HBR). HBR has been receiving a lot of attention both within and outside Japan. Studies in other countries have shown that HBR after early discharge from hospital can not only reduce the length of hospital stays, but also improve activities of daily living (ADL) scores, which measure the ability to perform household activities and psychological functioning [6−8]. In Japan, the national health insurance system was revised in 2006 to place a limit on the maximum coverage length of hospital-based rehabilitation. As a result, more patients still recovering after an early hospital discharge will rely on HBR. HBR, therefore, is expected to be in increased demand and play a more important role.

The demand for HBR in Japan was estimated to be around 10% of the patients requiring at-home nursing care [9]. A survey of the actual situation in 2006, however, revealed that HBR is only used by 0.8% of the patients nationwide, and is far from being adequately utilized [10]. Possible causes of this

shortfall include lack of resources, and care managers' insufficient knowledge and understanding of HBR. However, to date, there has not been any study that examines the connection between care managers' knowledge of HBR on the one hand, and their past experience with and the specific content of HBR on the other hand.

The aim of the present study is to describe the planning of home-based rehabilitation (HBR) by care managers and to determine whether a care manager's knowledge and understanding of HBR is correlated with their past experience of planning HBR.

Methods

Data collection

The participants are 500 certified care managers affiliated with the Miyagi Care Manager Association, randomly selected by the association. The questionnaire was mailed to each participant from the association. The survey period was early September through early October 2006.

The first section of the survey concerns general questions about past experience with HBR. The section examines the following: 1) whether there were any cases where the care manager considered planning HBR but was unable to select it; 2) if yes to 1), list barriers; 3) if yes to 1), list alternative plans; 4) whether the care manager has ever selected HBR; 5) if yes to 4) who was the person who originally proposed it; 6) if yes to 4) the content of the planned services (function improvement training, function sustenance training, ADL training, instructing on self-guided training, care-giving instructions, advice on obtaining assistive devices, environmental assessment with suggestions for restructuring, going-out training and mental support); 7) if the care manager has never selected HBR, the reason for never having selected it (Table 1).

The participant's knowledge and understanding of HBR was assessed by asking them to rate 57 statements regarding HBR by selecting an answer from one of five levels (definitely true, mostly true, don't know, mostly false, and definitely false). These statements were obtained from the previous semi-structured interviews of some care managers.

In an attempt to determine possible factors that influence the planning of HBR, the questionnaire included the following variables: 1) the gender of the participant; 2) the age of the participant; 3) the participant's practice area (within or outside the Sendai Metropolitan Area); 4) the number of years in practice; 5) availability of HBR staff (physical therapists, occupational therapists) in the practice area; 6) availability of facilities that offer HBR in the practice area; 7) the professional background of the participant which was a qualification to be a care manager, for example, nurse, physical therapist, caseworker, etc.).

Statistical methods and data analysis

All participants who responded to the questionnaire and are currently assisting in home care were included in the analyses. Respondents who no longer work as a care manager, or who work as an institutional care manager, were excluded.

First, the participants were divided into two groups: managers with prior HBR planning experience, and those without prior HBR experience. The participants' demography and their prior HBR experience were then compared using descriptive statistics including the chi-square test or student's t-test. For the description of the prior HBR experience of care managers, we counted the number of care managers who had cases where care managers considered planning HBR but were unable to select it, and who had each barrier to selection of HBR, and who had each alternative plan for the above cases. And we counted the number of cases for the people who proposed HBR originally and the content of the planned services.

In order to explore the factors that affect the practice of HBR, answers in the "knowledge and understanding" section were compared between the two groups using the chi-square test. Next, logistic regression analysis was performed on those respondents who have facilities offering HBR services available in their service area. Whether or not each participant has ever planned HBR was used as a dependent variable for this analyses. In addition, for the two groups divided by the experience of planning HBR service content, their responses to each statement in the care manager's

Table 1. Question items about past experience with HBR.

0)	Did you plan HBR in 2005?
1)	How many cases in 2005 did you have where you considered planning HBR but were unable to select it?
2)	List barriers to selection of HBR.
3)	List alternative plans for the above cases.
4)	Have you ever selected HBR?
5)	Who originally proposed it?
6)	What was the content of the planned services?
7)	List barriers to selection of HBR in the past.

HBR, Home-based Rehabilitation.

knowledge section were compared using the chi-square test.

We used the Fisher's exact test instead of the chi-square test, when cells with an expectation frequency less than 5 existed for all cells with more than 20%. The data were analyzed with SPSS version 11 for Windows. The significance levels were set at 5%.

This study was implemented with the approval of the institutional review board of the Tohoku University Graduate School of Medicine.

Results

The questionnaires were sent to 500 members. Five of the selected participants were excluded due to an unknown forwarding address or death. Out of the remaining 495 care managers, 260 responded, giving a response rate of 52.5%. Out of the 260 responders, 113 care managers who undertook home-based assistance were analyzed.

Demographic characteristics of the participants and current condition of HBR planning

Out of the care managers who currently assist with home care (N=113), 78 (69%) have selected HBR in the past, 31 (27%) have never selected it, and 4 (4%) did not respond. Table 2 shows the attributes of the care managers with and without prior HBR planning experience. Respondents with prior HBR experience are more likely to be female (p=0.030) and younger

Table 2. Characteristics of participants (Care managers).

		CM with prior HBR planning experience N=78	CM without prior HBR experience N=31
Gender: frequency (%)*	Male / Female	11 (14%) /67(86%)	10 (32%) /21 (68%)
Age: mean (±SD)*	Male / Female	41.2 (±8.8) /47.0 (±7.8)	52.0 (±14.6) /49.0(±8.5)
The number of years in practice: mean (±SD)		4.8 (±1.79)	4.3 (±2.16)
Practice area: frequency (%)	Within the City Area	38 (49%)	15 (43%)
	Outside the City Area	37 (47%)	16 (46%)
	Unknown	3 (4%)	
The professional background: frequency (%) (More than one answer was allowed.)	Doctor	1 (1%)	2 (5%)
	Dental Practitioner	0 (0%)	1 (2%)
	Pharmacist	1 (1%)	1 (2%)
	Public Health Nurse	6 (6%)	1 (2%)
	Nurse / Assistant Nurse	24 (26%)	7 (17%)
	Occupational Therapist	1 (1%)	0 (0%)
	Social Welfare Counselor	5 (5%)	4 (10%)
	Care Worker	36 (39%)	17 (41%)
	Dental Hygienist	4 (4%)	0 (0%)
	Judo Therapist	1 (1%)	1 (2%)
	Masseur / Acupuncturist / Moxibustionist	2 (2%)	0 (0%)
	Dietician (National Registered Dietician)	1 (1%)	0 (0%)
	Consultation Support Duties Worker / Care Duties Worker	9 (10%)	7 (17%)
	Other	3 (3%)	1 (2%)
Availability of HBR staff (physical therapists, occupational therapists) in the practice area: frequency (%)*	Available in a business establishment[#]	7 (9%)	1 (3%)
	Available in the corporation	6 (8%)	0 (0%)
	Nobody in the area	64 (82%)	29 (94%)
	Unknown	1 (1%)	1 (3%)
Availability of facilities that offer HBR in the practice area: frequency (%)*	Available	70 (90%)	20 (65%)
	Not available	6 (8%)	8 (26%)
	Unknown	2 (2%)	3 (9%)

CM, Care Managers; HBR, Home-based Rehabilitation.

*, $p<0.05$

[#], If a corporation has several facilities such as hospitals, care houses, and home-visit nursing stations, each facility is called a business establishment.

Table 3. Prior HBR experience of care managers.

		Frequency (%)
Cases where care managers considered planning HBR but were unable to select it (out of 113 participants)	I considered it.	72 (64%)
	I did not consider it.	36 (32%)
	Unknown	5 (4%)
Barriers to selection of HBR (multiple answers) (out of 72 care managers who had applicable cases)	Opposition by the client	36 (50%)
	Opposition by the client's family	26 (36%)
	Reservations against someone visiting their house	21 (29%)
	Disagreement with the doctor	5 (7%)
	Lack of rehabilitation staff	25 (35%)
	Economic reasons	14 (19%)
	Excess of rehabilitation credit	11 (15%)
	Others	15 (21%)
Alternative plans for the above cases (multiple answers) (out of 72 care managers who had applicable cases)	Outpatient rehabilitation at hospitals	13 (18%)
	Outpatient rehabilitation at care houses	47 (65%)
	Home-visit nursing	36 (50%)
	Home-visit care	7 (10%)
	Doing nothing	14 (19%)
	Others	7 (10%)
The person who originally proposed HBR (out of 609 applicable cases)	The client	65 (11%)
	The client's family	88 (14%)
	Care manager	377 (62%)
	Others	79 (13%)
The content of the planned services (multiple answer) (out of 609 applicable cases)	Function improvement training	189 (31%)
	Function sustenance training	170 (28%)
	ADL training	140 (23%)
	Instruction on self-guided training	36 (6%)
	Care-giving instructions	13 (2%)
	Advice on obtaining assistive devices	12 (2%)
	Environmental assessment with suggestions for improvement of housing	17 (3%)
	Going-out training	12 (2%)
	Mental support	6 (1%)
	Others	5 (1%)

(p=0.028). They tend to have facilities (p=0.006) that offer HBR services available in their practice area.

Table 3 shows the prior HBR experience of care managers. There were 72 (64%) respondents who reported a case where they considered but were unable to select HBR, 36 (32%) with no such cases, and 5 (4%) with no response. Common barriers (more than one answer was allowed) were the following: the client was opposed to it in 36 (50%) of the care managers' cases; the client's family was opposed to it in 26 (36%) of the care managers' cases; and the client or the family had reservations against someone visiting their house in 21 (29%) of the care managers' cases. Thus, the most common reasons were related to the client or the client's family. In 25 (35%) of the care managers' cases, on the other hand, a lack of resources such as rehabilitation staff was reported. In 60 (83%) of care managers' cases, ambulatory rehabilitation service using LTCI and National Health Insurance was selected instead. The most common party who originally proposed HBR in each case was the care manager (377 cases; 62%), followed by the client's family (88 cases; 14%), and the client (65 cases; 11%). These three parties combined (530 cases) proposed the service in 87% of all the selected cases. The most common contents of HBR services selected were function improvement training, function sustenance training, and ADL training.

Table 4. Six statements in the knowledge section made by two groups divided by their past selection status.

Item	CM with prior HBR planning experience N=78	CM without prior HBR experience N=31	chi-square test *p* value
"HBR can be adjusted to the home care setting."	N=77 (99.7%)	N=28 (86.8%)	0.069*
"HBR involves ADL training."	N=74 (94.9%)	N=24 (77.4%)	0.012
"HBR should be performed continually as a daily routine."	N=42 (53.8%)	N=25 (80.6%)	0.009
"HBR is not indicated for clients requiring medical management."	N= 4 (5.1%)	N= 6 (19.4%)	0.030
"There are few candidates for HBR"	N=17 (21.8%)	N=17 (54.8%)	0.001
"I am not familiar with the process for setting up HBR"	N= 5 (6.4%)	N=12 (38.7%)	<0.001

CM, Care Managers; HBR, Home-based Rehabilitation.
Numbers in the table represent the number of people who responded "definitely true" or "mostly true".
*, marginally significant (p<0.10)

Table 5. Factors influencing planning HBR: The results of logistic regression.

Variables	Standard partial regression coefficient	*p* value
"There are few clients suitable for HBR."	−1.21	0.003
"I am not familiar with the process for setting up HBR."	−1.33	<0.001
Gender	0.08	0.097
Age	−0.58	0.556

HBR, Home-based Rehabilitation.

Relationship between knowledge and understanding of the care manager and experience of planning HBR service

There were six statements in the knowledge/ understanding section where significant (p<0.05) or marginally significant (p<0.1) differences were found between the two groups divided by their past selection status (Table 4). These statements, sex and age were taken as independent variables for the logistic regression analyses. Whether or not the care manager has planned HBR was used as a dependent variable for this analyses. There are two statements that were shown to have significant correlation in the analyses. The results of the analyses show that the following two statements are negatively correlated with the care manager's prior HBR planning experience: "there are few clients suitable for HBR" (p=0.003), and "I am not familiar with the process for setting up HBR" (p<0.001) (Table 5).

Relationship between knowledge and understanding of the care manager and selected HBR service content

Of the 63 care managers who responded to this section, 8 were male (37.8±7.07 years old) and 55 were female (47±7.93 years old). For each type of service content, the two groups, those who have selected the service content and those who have not, were compared in their responses to the statements in the knowledge/ understanding section. Table 6 lists all the statements for which there was a significant difference between the two groups. We found that subjects who have selected services such as function improvement training, care-giving instructions, advice on obtaining assistive devices, and going-out training, generally agreed with the following statements: "HBR enables clients to do what they currently cannot do", "HBR trains clients to be able to go out", or "HBR can be used as a preparatory step for ambulatory rehabilitation services". On the other hand, managers who have never selected care-giving instructions, evaluating and suggesting home care restructuring, and going-out training, agreed with the following: "HBR often remains incomplete due to facility limitations", "HBR is conducted in the patient's own home" and "limited types of exercise can be offered in HBR".

Table 6 . Relationship between knowledge and understanding of the care manager and selected HBR service content.

Service content	Knowledge and understanding that were selected by the care managers who planned indicated content (left panel)	Knowledge and understanding that were selected by the care managers who did not plan indicated content (left panel)
Function improvement training	・HBR enables clients to do what they currently cannot do. ・HBR is used for clients who continue rehabilitation after discharge from hospital.	
ADL training		・HBR involves improving clients' living environment. ・HBR involves advice on assistive devices.
Instructing on self-guided training	・HBR is indicated only when a doctor determines so. ・The unit cost of HBR is high.	・HBR is used for clients who continue rehabilitation after discharge from hospital. ・HBR is used as a recreational activity.
Care-giving instructions	・HBR trains clients to be able to go out. ・HBR is mainly carried out therapeutically. ・There are different levels of competence in HBR among therapists.	・HBR often remains incomplete due to facility limitations.
Advice on obtaining assistive devices	・HBR involves range-of-motion training. ・HBR is training of a standing posture for activities. ・HBR involves physical strength training. ・HBR enables clients to leave their bed. ・HBR involves stretching exercises. ・HBR enables clients to do what they currently cannot do. ・HBR should be performed continually as a daily routine. ・HBR is performed as part of nursing care. ・HBR can be used as a preparatory step for ambulatory rehabilitation services. ・HBR is mainly used preventively. ・HBR is mainly carried out therapeutically. ・There are different levels of competence in HBR among therapists.	・HBR is used for clients who have difficulty in visiting hospitals. ・HBR is influenced by the relationships between the therapist and the client or his/her family.
Environmental a ssessment with suggestions for improvement of housing	・HBR is mainly carried out therapeutically. ・HBR is indicated only when a doctor determines so. ・HBR is used for clients who continue rehabilitation after discharge from hospital. ・The unit cost of HBR is high.	・HBR is conducted in the patient's own home. ・Limited types of exercise can be offered in HBR. ・HBR is used for clients who have difficulty in visiting hospitals.
Going-out training	・HBR should be performed continually as a daily routine. ・HBR can be used as a preparatory step for ambulatory rehabilitation services. ・HBR is used for bed-bound clients. ・HBR is mainly carried out therapeutically. ・HBR is difficult to accept for clients and their families.	・HBR is for when limited types of exercise can be offered. ・HBR is indicated when the client's illness is stabilized. ・I found it difficult to ask the rehabilitation staff for HBR.
Mental support		・HBR is used for clients who have difficulty in visiting hospitals.

The items in the knowledge and understanding section that have different response weightings between the two groups divided by their past selection status of indicated HBR service content (left panel).

Discussion

Current situation of HBR

Since 35% of the reasons for not being able to select HBR services were "lack of rehabilitation staff", many respondents pointed out the lack of resources. This has been reported nationwide[11], and it suggests that more resources are required. The revision of the medical treatment fees system in 2012 suggested that the at-home return of seriously ill patients increased. Therefore, it is thought that the role of home-based rehabilitation increased. With a view to the above tendency, governmental commitment is imperative.

While 88% of HBR services were proposed by the client, the client's family, or the care manager, 55% of the reasons for not using HBR were also due to resistance from the client or the client's family. The client, the client's family, and the care manager, rather than rehabilitation professionals, play the central role in utilizing HBR. The results of this study reconfirmed the importance to gain the understanding of clients and their family members, as noted by previous studies [12]. A gap in perception between patients and professionals on the idea of rehabilitation could interfere with efficient services, and could cause a temporary disabled state that requires nursing care [13]. Many of the current patients who require nursing care at home are categorized as falling into this temporary disabled state, where their ADL could be improved and their nursing care needs could be decreased if they received appropriate rehabilitation [14].

In almost half of the cases (48%) where HBR was not selected, ambulatory rehabilitation services were selected instead. It is thought that these cases included a lot of subjects who are appropriate for ambulatory rehabilitation rather than HBR. In other words it suggests the current situation that a lot of subjects who can use the ambulatory service are often prescribed home-based service. The objectives of HBR include treating social withdrawal and improving daily routines [15]. HBR is indicated when professional skills are called for directly in the daily activity setting, but it is not necessarily a better solution than institutional service for function sustenance [16]. The care manager needs to advise and manage care of the clients with a thorough understanding of the functions of rehabilitation services, while respecting the clients' own decisions and supporting their efforts towards an independent life.

Factors that affect selection of HBR and content of HBR services

The care managers who have selected HBR, compared with those who have not, tend to think that more clients are suitable for HBR, and tend to be more likely to understand the necessary procedures for starting HBR. Among the care managers with the experience, those who answered "HBR helps to enable clients to do things they are currently unable to do" and "HBR can be used as preparation for utilizing ambulatory rehabilitation services" are more likely to select a wider range of service content, including family care instructions and advice on obtaining assistive devices. It is thought that the managers who feel that HBR is a resource that can be used to assist recovering patients and to expand their living space propose broader contents. Care managers who have knowledge of the functions of HBR are more likely to select such contents as care-giving instructions, solidifying currently possible ADL at home, home care restructuring, and introducing appropriate assistive devices [17]. Different levels of knowledge and understanding among care managers, therefore, affect not only the selection, but also the content of the HBR services that they select.

On the other hand, subjects who have never selected HBR tend to think that there are no candidates that can benefit from HBR. This suggests that inadequate knowledge of the care manager leads to overlooking suitable candidates, and to not selecting HBR for the right clients at the right time. In order to recognize the appropriate points of intervention for HBR (i.e., re-establishment of the client's life, acceleration of the client's social participation, and appropriate times during living sustenance) [9], it needs to be understood widely that HBR is not merely functional training performed at home, but rather a resource that can facilitate improvements in various aspects of the client's daily life, such as living environments, improvement of housing and care-giving instructions, and can facilitate access to recovering patients after early discharge.

Future work

Previous studies pointed to "care managers' inadequate knowledge", but without any supporting data. The present study has shown that differences in care managers' knowledge and understanding, particularly concerning suitable candidates for HBR, does affect their HBR planning experience, and also affects the content of HBR services. Future work should examine the factors that cause such different levels in care managers' knowledge.

The collection rate for this study was 52.5%. Those who participated in this study are assumed to have a higher interest in HBR. It is possible, therefore, that the result of this study has a sampling bias toward a higher level of knowledge. The effect of knowledge might be more prominent if the subjects that were uncollected were included.

Future studies on this topic should focus on case characteristics, and should aim to identify the factors that influence the care managers' knowledge. This should help formalize the necessary public policy to facilitate optimal utilization of HBR.

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