

There Is No Place Like Home: A Survey on Satisfaction and Reported Outcomes of a Home-Based Rehabilitation Program Among Orthopedic Surgery Patients

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Abstract

Background: Home-based rehabilitation (HBR) was previously found to be associated with positive outcomes that are equal to inpatient rehabilitation. Few studies have examined the challenges patients are facing during rehabilitation and recovery and their satisfaction from HBR. **Objective:** The purpose of this study was to examine the overall satisfaction and reported outcomes of HBR. **Methods:** A telephone survey was conducted among 146 orthopedic surgery patients who participated in an HBR program, at the end of the HBR and 6 months after. The questionnaire included information about level of independence, satisfaction from HBR, and difficulties during HBR. **Findings:** The overall satisfaction was high (73.1%). Patients reported on improvements in level of independence between the time of hospital discharge, the end of the program ($P = .0001$), and the 6 months follow-up ($P = .004$). Long wait for beginning of HBR, being a widower, and residing in a facility or with a nonfamilial caregiver were associated significantly with less general well-being and independence. The repeated measures analysis showed age lower than 71 and private health insurance ownership were associated with a better recovery. The most common difficulties reported were physical difficulties, lack of function, and caregivers' burden. **Conclusions:** Patients and families need more emotional, social, and physical support during HBR. The increase in health services delivered in community settings requires a more clear-cut policy and supervision for HBR and the follow-up services.

Keywords

home rehabilitation, patients experience, health policy, patient-centered care, patient satisfaction, caregiver burden

Introduction

Rehabilitation is a continuous process that requires active maintenance in order to prevent a permanent disability by an illness or an injury and to increase independence (1). Rehabilitation can expedite the hospital discharge and prevent rehospitalizations (2). The closer the rehabilitation is to the hospital discharge, the more potential it will have to yield positive outcomes. The days and weeks after the injury are a “window of opportunities” for maximizing the rehabilitation potential, a window that if lost can lead to a permanent injury (3,4). In Israel, every citizen is entitled to physical rehabilitation after hospitalization, under the universal Health Insurance Law (1994). Regulations for rehabilitation are embedded in the Ministry of Health (MOH) “Criteria for rehabilitation treatment” (5) and are executed by the health-care providers.

Traditionally, rehabilitation was conducted in inpatient facilities. Inpatient rehabilitation provides 24-hour controlled

care by a multidisciplinary team. The daily routine in the rehabilitation unit is filled with activities that have a positive effect on the rehabilitation progress and on patients' motivation (6). However, as part of the growing trend of providing health-care services in the community, patients have the option of undergoing rehabilitation at home.

Home-based rehabilitation (HBR) programs provide custom-made services to patients at their home environment. Home-based rehabilitation includes the following services: physiotherapy, occupational therapy, nursing care (assistance in daily living activities such as walking, washing, and

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dressing up), physician, and nurse and social worker home visits. According to the MOH regulations, these services are to be provided within 72 hours from the hospital discharge, at least 3 times a week and at least 5 treatments per week (7). Patients are referred to HBR during inpatient care according to a number of indicators: level of motivation of the patient and the family; primary carers' ability to support the patient in the rehabilitation process; level of stability of patients' medical condition; suitability of living arrangements to patient's disability; and supportive services in the community (8). Patients who have private health insurance can purchase additional services such as physiotherapy and have more access to services and specialists after HBR is completed. However, private health care does not cover or provide HBR.

Home-based rehabilitation has been found in previous studies to have a few advantages for patients, families, and for the health system, including lower risk of deterioration from long inpatient stay, recovery in the patient's home environment, and reduced hospitalizations costs (9,10). A number of studies have shown that HBR contributed to improvements in activities of daily living (ADL), lower mortality, higher perceived health, and satisfaction from the rehabilitation compared to inpatient rehabilitation (11–13). In a study among patients who participated in an HBR program, patients reported that the home environment was comforting and relaxing and that it contributed to their recovery (10). Other studies found no differences in clinical outcomes between home and inpatient rehabilitation. Patients achieved similar improvements in pain measures and function (9,14,15). Studies that compared the cost-effectiveness between HBR and inpatient rehabilitation among varieties of patients found that it was similar (16,17). Others found that HBR is an economical alternative for inpatient rehabilitation (9,12,13).

Although HBR is considered cost-effective and is producing positive outcomes, patients are not always prepared for the transition from hospital to the home environment and for the emotional and physical challenges they face. Some feel isolated and find it difficult to navigate between the different services in the community (18). Most of the studies so far have examined clinical outcomes of HBR (19). Not many have examined the emotional and social challenges patients are facing during rehabilitation and recovery (20,21) or patients' satisfaction from HBR (15,22). As more and more health services are being delivered in the community rather than in inpatients facilities, it is important to examine patients' psychosocial needs, difficulties, and satisfaction from health and rehabilitation services. This study brings patients' perspective and presents the physical and emotional challenges during and after HBR.

Objective

The purpose of this study was to examine the overall satisfaction and reported outcomes from an HBR program in

order to improve HBR according to patients' needs. The specific goals were to examine (1) the overall satisfaction from HBR, (2) the reported outcomes of HBR, and (3) potential challenges faced by patients during HBR and the recovery process.

Methods

A telephone survey using a structured questionnaire was conducted among 146 orthopedic surgery patients from Rambam Medical Center in Haifa, Israel, between February 2017 and March 2018. The study included patients who were discharged from hospitalization into an HBR program. The inclusion criteria for the study were: age 18 or older, recently been hospitalized in the orthopedic department and went through surgery, currently in HBR, and having the physical and mental capability to participate in the survey. The survey was conducted at 2 time points: (1) at the end of the HBR program and (2) 6 months after completing HBR.

Sample

For the study purposes, a list of 229 orthopedic surgery patients who were referred to HBR was extracted from the orthopedic departments. Patients were contacted approximately 6 to 8 weeks after the beginning of HBR. A total of 146 (63.7%) patients met the criteria of the study population and agreed to participate. Eighty-three patients were either unavailable or could not speak at the time of the first survey. There were 2 attempts to reach each participant. Out of the 146 who participated in the first survey, 96 (65.7%) patients participated in the 6-month follow-up. Fifty participants were either unavailable or could not speak at the time of the second survey (a flowchart of the study's participation provided in Supplement 1).

A comparison was conducted between those who participated in the second survey and those who dropped out. There were more divorced and widowers and less married and singles among those who participated in the second survey compared to those who dropped out. In addition, more participants resided alone, with grown children or family members, among those who participated in the second survey. Those who did not participate in the second survey had a slightly lower level of independence compared to those who did participate in the second survey ($P = .04$; for the full comparison see Supplement 2).

Data Collection

The telephone survey was conducted using a structured questionnaire at 2 stages: (1) the end of HBR and (2) 6 months after completing HBR. The survey was conducted by social workers from the orthopedic department. Participation in the study was voluntary and obtained by participants' willingness to answer the telephone surveys. Consent was achieved verbally by answering the question: "Are you

willing to participate in the survey?” Details on study’s objectives and procedures were explained to participants by the social workers who conducted the survey. Participants were assured that all identifiers would be removed or disguised so that they are not identifiable. The Institutional Review Board of the Rambam Medical Center approved this study.

Each questionnaire administration lasted about 20 minutes. At the first questionnaire (at the end of HBR), patients were asked whether they agree to participate in the 6-month follow-up. Those who gave consent were contacted after 6 months by the same social worker who conducted the first interview.

Questionnaire

This study included 2 questionnaires, one for each stage. The questionnaires were constructed specifically for the purpose of this study. The questionnaires were built based on a psychosocial evaluation protocol used by social workers in the orthopedic department to assess readiness for rehabilitation. The protocol included personal information, level of function (filled by a nurse), level of motivation for rehabilitation, living arrangements, description of family, and the level of their involvement in the care of the patient. This protocol was expanded and evaluated by a group of experts from the orthopedic department that included the head of the orthopedic department, an orthopedic physician, and 2 nurses. The protocol was adjusted and revised based on the experts’ evaluation in order to fit the targeted population and study purposes.

The first questionnaire included the following items: (1) Satisfaction from HBR services: physiotherapy, occupational therapy, nursing care, doctors and nurses’ visits. Each service was rated on a scale of 1 to 3 (1 = not satisfied, 2 = partly satisfied, 3 = very satisfied, 999 = did not receive this service). (2) Overall satisfaction from HBR was rated on a scale of 1 to 3 (1 = not satisfied, 2 = partially satisfied, and 3 = very satisfied). (3) Reported level of independence (using assistive devices) at the time of the discharge from hospital and at the end of HBR was rated on a scale of 1 to 5 (1 = confined to bed, 5 = totally independent). (4) Number of days from the discharge from hospital until receiving HBR; and (5) sociodemographic characteristics including age, gender, family status, living arrangement, type of surgery, number of days in hospital, and private health insurance ownership.

The 6-month follow-up questionnaire included the following items: (1) overall satisfaction from HBR rated on a scale of 1 to 3 (1 = not satisfied, 2 = partially satisfied, and 3 = satisfied); (2) reported level of independence (using assistive devices) rated on a scale of 1 to 5 (1 = confined to bed, 5 = totally independent); (3) general well-being based on one question: How would you describe your overall general feeling (physical, emotional, social)—The question was rated on a scale of 1 to 5 (1 = not at all, 5 = very

good); and (4) difficulties during HBR using an open-ended question: “what were the difficulties you have experienced during HBR?”

Data Analysis

Standard univariate analyses were conducted to describe the characteristics of the study population by sociodemographic. Descriptive statistics of the study variables are presented according to the time of questionnaires (first questionnaire and 6-months follow up) using prevalence rates and mean averages according to the type of variable. Since most of the variables in this study were on a Likert-type scale and were not pure quantitative, we analyzed the data using parameter estimates for normally distributed data. Univariate analysis was conducted using *t* test, analysis of variance, and χ^2 to examine correlations between satisfaction and independence and in order to examine differences in level of independence between time of hospital discharge, the end of HBR, and the 6-month follow-up. In order to assess sociodemographic characteristics associated with satisfaction and reported outcomes of HBR, *t* test, χ^2 , and Pearson correlations conducted according to type of variable. A repeated measures analysis was used to examine the independent associations between level of independence and sociodemographic characteristics across the 3 measuring times. All analyses were performed using SPSS version 25.

The open-ended question about participants’ difficulties and challenges was summarized and divided into the following themes: caregivers’ burden, physical/function difficulties, feelings of uncertainty about the future, lack of support from the environment, lack of information (about the condition, treatment options, rehabilitation process, and so on), difficulties navigating the health system, and lack of accessibility in the home.

Findings

Table 1 presents the sociodemographic characteristics of the study population as reported by participants at the end of their participation in the HBR program. The sample included 146 orthopedic surgery patients discharged after hospitalization into HBR. Most participants were women (64.4%), married (65.5%), and resided with family members (75.2%). The rest resided alone (9.7%) in a facility or with a 24-hour caregiver who is not family (15.1%). The mean age was 65.35 (standard deviation [SD] = 15.32). Most participants did not have private health insurance (82.9%). The most common surgery was due to fractures (34.9%) and knee replacements (26.7%). The average hospital stay was 6.59 days (SD = 4.34). Patients reported an average of 4.58 (SD = 4.67) days waiting for HBR after discharge from hospital.

Participants were asked to rate their level of satisfaction from HBR services on a scale of 1 to 3 (1 = not satisfied, 2 = partially satisfied, and 3 = satisfied). Figure 1 presents the level of satisfaction from each service (physiotherapy,

Table 1. Sociodemographic Characteristics of Study Population Reported by Participants at the End of the HBR Program.^a

Age (Mean, SD)	65.35 (15.32)
Gender	n (%)
Women	94 (64.4%)
Men	52 (35.6%)
Private (commercial) health insurance ownership	25 (17.1%)
Family status	n (%)
Married	93 (65.5%)
Single	9 (6.3%)
Widower	31 (21.8%)
Divorced	9 (6.3%)
Living arrangement	n (%)
Life partner	96 (66.2%)
Alone	14 (9.7%)
Grown children	12 (9%)
Facility/Nonfamilial 24-hour caregiver	14 (10.4%)
Other	8 (4.7%)
Type of surgery	n (%)
Knee replacement	39 (26.7%)
Fracture	51 (34.9%)
Hip replacement	33 (22.6%)
Fixation	7 (4.8%)
Spine	6 (4.1%)
Other	10 (6.8%)
Hospitalization days	
2-7	108 (74%)
8-14	30 (20.5%)
15-28	8 (5.4%)
Hospitalization days, mean (SD)	6.59 (4.34)
Number of days from discharge until HBR, mean (SD)	4.58 (4.67)

Abbreviations: HBR, home-based rehabilitation; SD, standard deviation.
^an=146.

doctor's visit, nurse's visit, nursing care, and occupational therapy), the overall satisfaction, and reports on services that were not received at all.

The overall satisfaction was high (73.1%). The services provided with the highest satisfaction rate were physiotherapy (74.1%) and doctors' visits (71.4%). Most participants reported they did not receive occupational therapy (71.4%) or nursing care (76.1%) services.

A second interview was conducted 6 months after completing HBR. Patients were asked to rate their satisfaction from HBR results and their level of independence. Table 2 presents the differences in participants' reports on their level of independence between the time of discharge from hospital, the end of HBR, and 6 months after HBR ended.

There were significant improvements in level of independence between the time of discharge (Mean = 2.88, SD = 0.80), the end of the HBR (Mean = 3.74, SD = 1.15), and at the 6-month follow-up (Mean = 3.95, SD = 1.24; $P = .0001$). Significant improvement in participants' level of independence was also found between the end of the HBR and at the 6-month follow-up ($P = .004$).

Associations were examined between level of independence and satisfaction from HBR, as presented in Table 3.

Positive associations were found between satisfaction from HBR and level of independence at the end of HBR and at the 6-month follow-up ($P = .0001$) but not with the level of independence at the time of discharge from hospital.

Additional associations were examined between waiting time for HBR, level of independence, and satisfaction with HBR. Negative associations were found between waiting time for HBR and level of independence at the end of HBR ($r = -.23$; $P = .01$) and 6 months after ($r = -.29$; $P = .004$). Patients who waited fewer days for HBR also reported a higher satisfaction from HBR at the end of the program ($r = -.30$; $P = .0001$) and at the 6-month follow-up ($r = -.23$; $P = .02$). They also reported better general well-being ($r = -.23$; $P = .02$; data not shown in table).

Patients were asked an open-ended question regarding difficulties they have experienced during the HBR program. The reports summarized and categorized into main themes. Table 4 shows patients' reports on difficulties during HBR.

Most of the difficulties reported were regarding physical condition, lack of function, and mobility (31.8%). Patients and families also reported that the caregivers' load is too high (22.7%) and that they felt alone due to lack of physical and emotional support from their environment (20.5%).

Sociodemographic Correlations

Associations between the dependent variables (level of independence and satisfaction from HBR) and sociodemographic variables (gender, age, family status, living arrangement, and having a private health insurance) were examined (data not shown in table). Older participants reported on a lower level of independence compared to younger participants at the 6-month follow-up ($r = -.28$; $P = .005$). Widowers reported on a lower level of independence at the end of HBR ($P = .007$) and at the 6-month follow-up ($P = .001$), compared to married and divorced participants, and had the lowest average of general well-being (Mean = 2.41, SD = 1.36; $P = .04$). Participants who resided with a partner or alone reported on the highest level of independence and well-being, and participants who resided in a facility or with a nonfamilial 24-hour caregiver reported the lowest level of independence and well-being at the end of the HBR and at the 6-month follow-up. Those differences were significant only at the 6-month follow-up ($P = .01$). Participants with a private health insurance reported a significantly higher independence level compared to those without a private health insurance, at the end of the HBR ($P = .03$) and at the 6-month follow-up ($P = .02$).

Repeated Measures Analysis for Associations Between Level of Independence and Sociodemographic Characteristics

A repeated measures analysis was conducted (Table 5) in order to examine the associations between level of

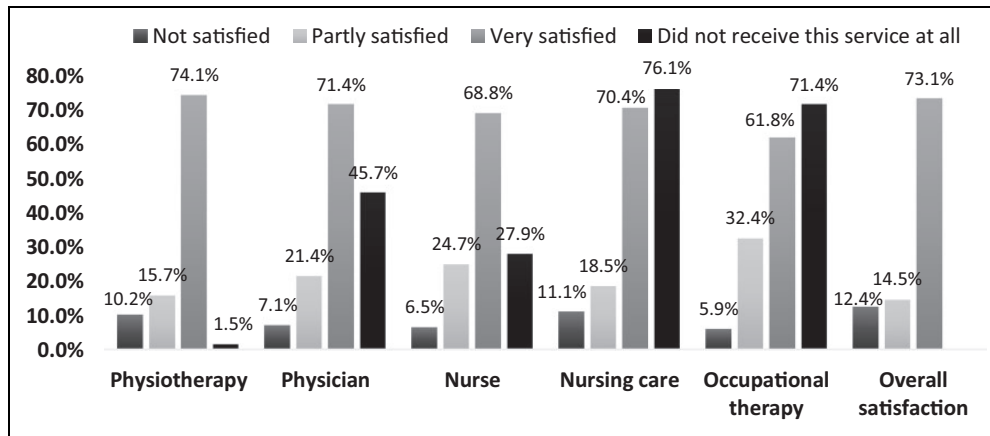


Figure 1. Satisfaction from home-based rehabilitation (HBR) services as reported by patients at the end of HBR (n = 146).

Table 2. Multivariate Repeated Measures Analysis of Differences in Participants' Reports on the Level of Independence (Using Assistive Devices; 1 = confined to bed, 5 = Independent) Between Different Times of Measuring.

Level of Independence, n (%)	Confined to Bed	Wheelchair	Walker	Cane/Crutches	Independent	Mean (SD)	P ^a
Discharge from hospital	9 (6.3%)	36 (25.4%)	75 (52.8%)	21 (14.8%)	1 (0.7%)	2.88 (0.80)	P ₁ = .0001
End of HBR	6 (6.3%)	7 (7.3%)	20 (20.8%)	35 (36.5%)	28 (29.2%)	3.74 (1.15)	P ₂ = .0001
Six-months follow-up	8 (8.3%)	6 (6.3%)	13 (13.5%)	27 (28.1%)	42 (43.8%)	3.95 (1.24)	P ₃ = .004

Abbreviations: HBR, home-based rehabilitation; P₁, discharge from hospital vs end of HBR; P₂, discharge from hospital vs 6-month follow-up; P₃, end of HBR vs 6-month follow-up; SD, standard deviation.

^aMultiple comparisons by Bonferroni.

Table 3. Associations Between the Reported Overall Satisfaction From HBR and Level of Independence (Using Assistive Devices; 1 = Confined to bed, 5 = Independent) During Discharge From Hospital, the End of HBR, and 6 Months After HBR Ended (1-Way ANOVA).

Level of Independence, Mean (SD)	Not at All Satisfied	Partially Satisfied	Very Satisfied	P ^a
Hospital discharge	2.73 (0.82)	2.88 (1.05)	2.92 (0.75)	P ₁ = 1.00 P ₂ = .91 P ₃ = 1.00
End of HBR	2.81 (1.23)	3.90 (0.78)	4.12 (0.91)	P ₁ = .01 P ₂ = .0001 P ₃ = 1.00
6-months follow-up	3.00 (1.47)	4.20 (0.63)	4.27 (1.03)	P ₁ = .01 P ₂ = .0001 P ₃ = 1.00

Abbreviations: ANOVA, analysis of variance; HBR, home-based rehabilitation; P₁, not at all vs partially satisfied; P₂, not at all vs very satisfied; P₃, partially vs very satisfied; SD, standard deviation.

^aMultiple comparisons by Bonferroni.

Table 4. Patients' Reports on Difficulties They Have Experienced During the HBR Program.

	n	%
Physical/function/mobility difficulties	14	31.8
Caregivers' burden	10	22.7
Lack of support from the environment	9	20.5
Difficulties navigating the health system	5	11.4
Lack of accessibility in the home	4	9.1
Lack of information	1	2.3
Feeling of uncertainty	1	2.3

Abbreviation: HBR, home-based rehabilitation.

independence and sociodemographic variables at different times of the survey (discharge from hospital, end of HBR, and 6-month follow-up). The sociodemographic variables included in the analysis were age-group (18-60, 61-70, and 71+), gender (men/women), family status (married and not married), and private health insurance ownership (no/yes).

All age-groups showed improvement in level of independence across the 3 measures. There were no differences between the groups at discharge from hospital. However, participants aged 61 to 70 reported on a higher level of independence compared to those aged 71+ at the end of HBR (P = .007) and at 6-month follow-up (P = .001). Men

Table 5. Repeated Measures Analysis for Associations Between Sociodemographic Characteristics and the Improvement in Level of Independence Over Time.

		Level of Independence, Mean (SD)			P_1
		Discharge From Hospital	End of HBR	6-Month Follow-Up	
Age-group	18-60	2.79 (0.83)	3.67 (1.12)	3.96 (1.19)	.001
	61-70	3.05 (0.70)	4.11 (1.07)	4.38 (1.18)	.0001
	71+	2.74 (0.89)	3.35 (1.17)	3.42 (1.17)	.01
	P_2	.11	.007 ^a	.001 ^a	
Gender	Women	2.74 (0.66)	3.62 (1.04)	3.88 (1.18)	.0001
	Men	3.11 (0.98)	3.94 (1.30)	4.06 (1.30)	.0001
	P_2	.03	.20	.51	
Family status	Married	2.98 (0.77)	3.83 (1.15)	4.12 (1.18)	.0001
	Not married	2.70 (0.86)	3.55 (1.17)	3.61 (1.33)	.003
	P_2	.13	.27	.06	
Private health insurance	No	2.92 (0.77)	3.62 (1.17)	3.82 (1.26)	.0001
	Yes	2.66 (0.97)	4.33 (0.90)	4.60 (0.91)	.0001
	P_2	.27	.02	.02	

Abbreviations: HBR, home-based rehabilitation; P_1 , comparison within groups; P_2 , comparison between groups; SD, standard deviation.

^aDifferences between ages 61 to 70 and ages 71+.

had a higher independence level compared to women during the discharge from hospital ($P = .03$). However, both men and women reported improvement in independence level across the 3 measuring times ($P = .0001$). Both married and not married participants reported on improvement in the level of independence across the 3 measures, and no differences were found between them across the 3 measures. Improvement in independence level was found among participants with and without private health insurance. However, participants with private health insurance had a significantly higher improvement at the end of HBR and at the 6-month follow-up compared to participants without private health insurance ($P = .02$).

Discussion

The purpose of the current study was to examine the reported satisfaction and outcomes of HBR among orthopedic surgery patients at the end of HBR and 6 months after. The overall satisfaction was high, and the service provided with the highest satisfaction rate was physiotherapy. The reported level of independence improved from the time of hospital discharge and until the 6-month follow-up. High satisfaction from HBR was strongly correlated with a high level of independence. Patients who waited for fewer days for the HBR reported on a higher satisfaction and a better general well-being. Most of the difficulties reported by the participants were regarding the patients' physical condition and the caregivers' burden of care. Older age, being a widower, residing in a facility or with a nonfamilial caregiver, and not having a private health insurance were found to be associated significantly with lower independence level and less general well-being. Age 71+ and private health

insurance ownership were associated with higher improvement in independence level over time.

Home-based rehabilitation is becoming increasingly prevalent as the preferred rehabilitation method. Therefore, it is important to examine the reported subjective efficacy and satisfaction among patients and families who receive it. In this study, the reported independence level has improved during HBR and continued to improve at the 6-month follow-up. These findings are in coherence with previous studies that showed improvements in ADL, level of independence, and quality of life at 6 and 9 months after HBR completed (23,24).

Although most patients in this study reported they were very satisfied with HBR, a high percentage reported they did not receive many of the HBR services such as nursing care, occupational therapy, and doctor visits. These findings indicate that patients are not always aware of the services they are entitled to or that they lack the power and motivation to report and insist on receiving the missing services. These findings also indicate that HBR is not yet well established, and more resources and information for patients are needed in order to make sure that patients receive the full HBR program.

An important finding of this study was the association found between waiting times for HBR and the reported outcomes and satisfaction. Shorter waiting times were associated with more positive reported outcomes. These findings are consistent with previous studies which showed that the major part of recovery occurs during the first month after hospital discharge, and therefore it is important to take advantage of this "window of opportunity" in order to maximize the recovery potential (2,25).

Returning home after hospitalization may be difficult and requires readjustments to daily life. The purpose of HBR is

to alleviate some of these difficulties by having the rehabilitation in patients' normal surroundings. In this study, most patients reported that their physical disability itself was the main problem. Others reported that they did not have enough support in their community. These difficulties are common among patients who have experienced long hospitalizations due to an injury or an illness. Patients may struggle socially and experience loneliness and social isolation after discharge from hospital and in the recovery process while their function is limited (21).

Family caregivers face many challenges themselves. They might have feelings of powerlessness, uncertainty, and can even experience physical and psychological symptoms such as posttraumatic stress disorder. They might feel ashamed for not being successful in taking care of the patients and too embarrassed to reach out for help (26–28). These findings indicate that patients may report they are satisfied with HBR and show great improvement. However, there are still many unmet needs that patients and families face which are not always reported. Case managers and rehabilitation professionals assist patients and families in formulating and implementing the treatment plan according to patients' medical, psychosocial, and functional needs. Case managers accompany patients from the day of the injury or illness eruption, throughout the rehabilitation process. They consult and support patients and their families and relieve some of the burden of care (29).

When examining associations with sociodemographic variables, widowers and participants who resided in a facility or with a nonfamilial caregiver reported less independence and well-being. In addition, age 71+ was associated with less improvement in independence. Literature shows that people with less familial support and of old age are more prone to loneliness and social isolation (30). Family and social support contribute to recovery and positive outcomes during rehabilitation (20,31).

Private health insurance was also found associated with better reported outcomes from HBR. Home-based rehabilitation is part of patients' universal health care and is time limited. Although private health care does not provide HBR, patients may use their private health insurance in order to purchase more services after completing HBR. This finding indicates that participants who had additional resources could have used those to sustain their recovery even after HBR was over. This finding highlights the need to provide more services in the community as part of universal health care for patients who completed rehabilitation and in the need of maintaining the results they achieved, especially among weaker populations. The use of technology is one of the ways to monitor patients remotely in a cost-effective way, which is beneficial especially for patients with limited resources (32). Previous studies have shown that using technology in rehabilitation is not only cost effective but also gives patients the aids and motivation to perform the therapy and to monitor the outcomes independently (33).

Limitations

This study had a few limitations. First, the small convenience sample and lack of randomization may incline to certain perceptions and preferences regarding HBR and affect the generalizability of the findings. Second, the variability of participants' surgeries and living arrangements may have had an influence on the recovery process and HBR outcomes. In addition, there could be potential bias resulting from the attrition accrued between the first and the second rounds of the survey. Third, confounders such as adherence to HBR and the amount of activity performed by the participants may have swayed the results. Finally, this study examined patients' perspective and opinions, and therefore the findings may be subjected to social desirability and reporting bias. Despite these limitations, the current study offers new insights into the practice of HBR and brings patients' perspective and voice in order to adjust the current services according to their needs.

Conclusions and Recommendations to Policy

Overall, this study showed that patients were satisfied with the services provided to them and reported positive outcomes. However, our findings reveal that patients and families need more emotional, social, and physical support, especially among older adults who constitute the majority of the target population for rehabilitation and are at higher risk of loneliness and social isolation. Older adults are also vulnerable to injuries and deterioration due to long hospital stay and are less likely to regain independence after an injury. Our findings suggest that HBR services need to be adjusted to this vulnerable population by offering more services that will support their psychosocial needs. The MOH continues to develop new services and to improve existing ones. However, there are no definitive and obligatory guidelines for the services that should be included in HBR. The lack of a clear-cut policy, guidelines, and control results in difficulty in services de facto.

Our findings suggest that patients might report they are satisfied from health services and that they have experienced improvement in independence. However, they are not always aware of the services they are entitled to or have the power to coordinate these services. Therefore, there is a risk that patients and families might not receive enough support during the time of rehabilitation. A case manager can provide a consistent follow-up and coordinate between patients and the service providers. Technology may also serve as a tool to bridge the current gaps in HBR and to provide a follow-up and maintenance for HBR patients. In an era where the institutional care is becoming shorter, it is important to strengthen the services in the community and to provide evidence-based services.

Future research can compare HBR to inpatient rehabilitation in a randomized control trial of larger samples, in order

to examine clinically the efficacy, satisfaction, and the challenges patients are facing. In addition, it is important to examine the role of case management in HBR and how effective it is in minimizing social isolation, burden of care, and the overall recovery of patients. Longitudinal studies needed in order to examine the efficacy of using advanced technology in maintaining patients' improvements for the long term.

Authors' Note

Roni Gagin and Neta HaGani have contributed equally to this work. All authors participated in the manuscript preparation and contributed to the conception and design of the study.

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Supplemental Material

Supplemental material for this article is available online.

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