



Don't Worry, Be Positive: Improving Functional Recovery 1 Year After Hip Fracture

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KEY WORDS

Functional Independence Measure
hip fracture
physical function
rehabilitation

It is not uncommon for studies examining factors associated with functional recovery 1 year after hip fracture to be presented from the perspective of clinicians or researchers. Few studies have examined factors that facilitate functional recovery from the patient's perspective. This article discusses community-dwelling older adults age 65 and older who sustained a hip fracture and received surgical repair and postacute rehabilitation. Data were collected 1 year after postacute rehabilitation. Content analysis was used for the descriptive study. Participants reported that rehabilitation services greatly facilitated their recovery. Participants also recognized the importance of their own motivation, and noted it was essential to maintain a positive attitude and fully engage in recommended rehabilitation activities. The keys to functional recovery were active participation in rehabilitation and following instructions from care providers. In addition, self-determination, a positive attitude, and social support played significant roles in making rehabilitation work.

Hip fractures cause significant mortality, morbidity, and disability among older adults (Frihagen, Nord-sletten, & Madsen, 2007; Hershkovitz, Kalandarov, Hermush, Weiss, & Brill, 2007; Latham, Jette, Warren, & Wirtalla, 2006; Press, Grinshpun, Berzak, Friger, & Clarfield, 2007), account for 266,000 hospital discharges (DeFrances & Hall, 2007) and 600,000 nursing home admissions, and cost Medicare \$2.8 billion each year (Latham et al.; Schneider & Guralnik, 1990; Titler et al., 2007). More than 4% of patients with hip fractures die during initial hospitalization, and 18%–33% will die within 1 year of fracture (Frihagen et al.; Hershkovitz et al.; Latham et al.; Pitto, 1994; Schroder & Erlandsen, 1993). Between 26%–65% of patients lose their ability to walk or do not recover their prefracture ambulatory status within the year following their fracture (Binder et al., 2004; Hershkovitz et al.; Koval & Zuckerman, 1994; Latham et al.; Wolinsky, Fitzgerald, & Stump, 1997).

Compromised mobility and self-care ability affect not only a person's functional independence, but his or her family and society as a whole. The older population in the United States is expected to reach 71.5 million in 2030, when all baby boomers will have turned 65 (U.S. Census Bureau, 2004). Because hip fracture is associated with aging, its incidence is certain to increase. The healthcare cost and society's ability to provide necessary care to older people with hip fractures is a crucial healthcare issue.

Studies focusing on hip fracture rehabilitation and functional outcomes can be categorized into three groups. The first group, clinical research, focuses on surgical treatments (e.g., internal fixation versus hemiarthroplasty) or rehabilitation (e.g., rehabilitation hospital versus skilled nursing facility rehabilitation) on selected functional outcomes during the acute care and postacute hospi-

talization periods (Hershkovitz et al., 2007; Isotalo, Rantanen, Aarimaa, & Gullichsen, 2002; Latham et al., 2006; Rodriguez-Merchan, 2002; Young, German, Brant, Kenzora, & Magaziner, 1996). These types of studies have helped our understanding about which treatment modalities can produce better functional recovery, such as mobility or activities of daily living (ADLs). The second types of studies are epidemiological, which focus on hip fracture prevalence and incidence rates, postacute care mortality and disability rates 1 year after hip fracture, or postacute care discharge location (Chevalley et al., 2007; Ingemarsson, Frandin, Mellstrom, & Moller, 2003; Latham et al.; Magaziner et al., 2000; Rosell & Parker, 2003; Young, Brant, German, Kenzora, & Magaziner, 1997). These studies provide valuable information so policymakers and healthcare providers can make informed decisions on health manpower planning and scarce health resources allocation. The third types of studies are outcome evaluation studies that primarily center on factors associated with functional recovery, including sociodemographics (age, gender, income, and marital status), health status (osteoporosis or diabetes), functional status (mobility and ADLs), and social support (frequency of contacts with children and friends; Adunsky, Lusky, Arad, & Heruti, 2003; Boonen et al., 2004; Kristensen, Foss, & Kehlet, 2007; Press, Grinshpun, Berzak, Friger, & Clarfield, 2007; Young et al., 1996). Study results on determinants are useful and play important roles in shaping or modifying treatment methods and interventions to foster functional recovery.

Findings from these clinical, epidemiological, and outcome evaluation studies have improved our understanding of the hip fracture functional recovery process and associated outcomes. However, most of these studies come from the perspective of clinicians and

researchers, but not patients. Patients with hip fractures are the key players in the recovery process and often do not have the opportunity to contribute their ideas about what was most helpful for functional recovery 1 year after hip fractures. To determine why some hip fracture survivors return to their prefracture function and others do not, this article explores factors associated with functional recovery from the patient's perspective.

Methods

The goal of this study was to explore the perceptions of older adults regarding their functional recovery 1 year after hip fracture and was part of a larger longitudinal study "Rehabilitation and Functional Recovery after Hip Fracture (Rehab&Hipfx)," funded by a National Institutes on Aging grant. The primary goal of the Rehab&Hipfx study was to explore the effectiveness of postacute rehabilitation on functional recovery and the costs incurred during recovery among elderly patients with hip fracture.

Study Sample and Data Source

Using convenience sampling, 62 participants from the Rehab&Hipfx study ($N = 280$) were invited and completed an exit interview immediately after the 12-month posthip-fracture follow-up data collection. The exit interview was a thematic survey with open-ended questions that explored areas influencing functional recovery and participants' willingness to engage in rehabilitation activities. Interview questions focused on four areas: satisfaction with functional recovery postfracture, factors that facilitated or hindered postacute recuperation

experiences, areas that would improve the functional recovery process, and the advice participants would give to other patients with hip fracture to help with recovery (Figure 1). The responses were transcribed verbatim by a physical therapist and a physician assistant. Both clinicians were familiar with hip fracture care and received three sessions of interview training at the Center on Aging and Health at Johns Hopkins in Baltimore. Both interviewers also were certified to use the Functional Independence Measures (FIM) instrument. Eligibility criteria for this substudy were the same as for the Rehab&Hipfx study and were determined 12 months before the substudy. Eligibility criteria included 1) age 65 years or older, 2) community-dwelling, 3) admitted to one of the five predetermined rehabilitation sites with a primary diagnosis of acute hip fracture (ICD9-CM 820.0-820.9), 4) receiving a surgical procedure (ICD9-CM 81.21, 81.40, 81.51, 81.52; National Center for Health Statistics and Centers for Medicare & Medicaid Services, 1997), 5) having a nonpathological fracture, and 6) having no evidence of metastatic cancer. The study was approved by the internal review boards of the Johns Hopkins Bloomberg School of Public Health and each participating rehabilitation facility in Baltimore.

Table 1 shows the sociodemographic characteristics of the study participants ($n = 62$). The average age of the patients was 78 years, with a range of 65–91. The majority of the patients were women (76%), Caucasian (92%), and living with others (45%). They had an average of 12.6 years of education, and 17% had an annual income of \$50,000 or more.

Figure 1. 1-Year Postrehabilitation Questionnaire

1. Have you been satisfied with your functional recovery since your hip-fracture surgery? • YES ____ • NO ____
1a. If "YES," what do you think has helped the most with regards to your recovery process? _____ _____
1b. If "NO," what do you think has hindered your recovery process the most? _____ _____
1c. If "NO," what things would you have liked to see differently regarding your recovery process? _____ _____
2. What do you think needs to be done to help improve the functional recovery process for future hip-fracture patients? _____ _____
3. What one piece of advice would you give a hip-fracture patient to help them with their recovery? _____ _____

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Table 1. Comparisons of Sociodemographic Characteristics at Baseline Between Patients Satisfied and Not Satisfied with Their Functional Recovery (n = 62)

Characteristics	Patients with Exit Interviews		P value
	Satisfied with Recovery (%) (n = 53)	Not Satisfied with Recovery (%) (n = 9)	
Age			
65–74	22.6	33.3	0.53*
75–84	62.3	44.4	
85+	15.1	22.2	
Mean (SD)	78.6 (6.7)	76.9 (7.4)	0.49
Range	[65–91]	[66–86]	
Gender			
Female	75.5	77.8	1.00*
Male	24.5	22.2	
Race			
White	90.4	0.0	1.00*
Nonwhite	9.6	100.0	
Marital status			
Currently married	41.5	33.3	0.73*
Not currently married	58.5	66.7	
Living arrangement			
Living alone	45.3	44.4	1.00*
Living with others	54.7	55.6	
Education in years			
Mean (SD)	12.8 (3.6)	11.9 (3.0)	0.68
Range	[0–20]	[7–16]	
Income			
Less \$9,999	0.0	0.0	1.00*
\$10,000–\$24,999	55.6	66.7	
\$25,000–\$49,999	22.2	33.3	
\$50,000 or more	22.2	0.0	
Mini Mental State Examination			
Mean (SD)	28.0 (1.8)	28.6 (1.9)	0.44
Range	[24–30]	[25–30]	
Comorbidity			
Mean (SD)	2.1 (1.3)	2.1 (1.2)	1.00
Range	[0–5]	[0–3]	

Note. *Fisher's exact test.
Comorbidity (0–12) includes angina, myocardial infarction, congestive heart failure, peripheral vascular disease, osteoporosis, osteoarthritis, rheumatoid arthritis, stroke, Parkinson's disease, respiratory disease, diabetes, and cancer.

Data Analysis

Data analysis was conducted using basic content analysis (Crabtree & Miller, 1992) and started with the first interview. Although the interview guide used in this study contained specific themes and directed participants to address things that facilitated their recovery process, response analysis was conducted using participants' own words to capture their particular responses and ideas about thematic areas. The analysis was consistent with in vivo coding (Dowd, 1991). The following is an example of in vivo coding:

The code identified was "be positive"

- Have a positive attitude
- Be positive and never give up

- Don't feel helpless—try not to depend on others, do it yourself
- Be always positive.

A list including a definition of each code was developed and continually revised as new codes were added. Codes were then grouped based on similarities and differences. For example, a number of codes that focused on the factors that helped individuals through the recovery process were identified in the data. This theme was referred to as "factors that facilitate recovery post-hip fracture." Using the above coding strategy, 25 codes were identified and collapsed into four major themes (Table 2): facilitators of the recovery process, factors that hindered recovery, system recommendations to facilitate recovery, and peer advice to facilitate recovery.

Confirmability and Credibility of the Qualitative Data

Confirmability refers to the degree of agreement among different analysts' interpretations of data. To achieve confirmability, data initially were coded by the first reviewer who was a geriatric nurse practitioner and researcher familiar with the hip fracture recovery trajectory. The coded data then were given to a second researcher, an epidemiologist and gerontologist who had studied patients post-hip fracture across the entire recovery trajectory. The second reviewer independently coded the transcripts, compared her coding to the coding of the first reviewer, and then discussed the findings with the first reviewer. As the discrepancies were identified, the reviewers went back to the data to clarify their interpretations. This type of iterative process was continued until consensus was achieved.

Data credibility refers to the believability, fit, and applicability of the findings to the phenomena under study (Habermann-Little, 1991). To address credibility, the findings were presented to an interdisciplinary group of clinicians and researchers (one physician, four epidemiologists, three exercise trainers, one physical therapist, and one occupational therapist) familiar with the hip fracture recovery trajectory to establish if the findings made sense and were consistent with the current understanding of the recovery process post-hip fracture. The findings were presented informally in a small group and one on one in the clinical setting. Participants were asked to verbally confirm or refute the findings.

Results

Participants who were satisfied with their functional recovery ($n = 53$) shared their experiences of factors conducive to their functional recovery; those who were not satisfied ($n = 9$) shared their experiences of factors that hindered recovery. The other two themes were system recommendations to facilitate functional recovery and intrinsic or peer advice for future patients with hip fracture on factors that facilitate functional recovery.

Facilitators of Recovery

Participants described a number of factors that facilitated recovery, including professional care, social support, determination, spirituality, individualized care, lifestyle factors, goals, and environment (Table 2).

Professional Care

Participants repeatedly noted that the professionals (physical therapists and nurses) they encountered during their postacute inpatient rehabilitation program had a major effect on their recovery. This included interactions with orthopedic surgeons, nurses, and therapy staff (physical and occupational therapists). Participants felt buoyed by seeing their physician frequently and having what they perceived as "very good doctors" or "good surgeons," and getting "correct" or "professional" care from rehabilitation providers. They evaluated providers as a team in the rehabilitation setting and did not single out one provider over the other in terms of help and support received. Moreover, participants particularly recognized the skill of the provider, evaluated based on successful surgical outcomes or receiving information that facilitated recovery. Communication and a positive attitude on the part of professional providers also were important to participants.

Social Support and Spirituality

Participants reported that support from family and friends also was essential to their recovery. Specifically, participants said verbal encouragement from family and friends helped them maintain an optimistic attitude during rehabilitation. "The help, encouragement, and support that I got from my family and friends are essential..." and "People around me lifted up my spirits" were among participants' comments. In addition, participants reported that spirituality and a belief in a supreme being helped them maintain their optimism throughout the recovery process.

Table 2. Theme Development

Theme	Facilitators of Recovery	Factors That Hinder Recovery	System Recommendations to Facilitate Recovery	Peer Advice to Facilitate Recovery
Codes (number of times noted)	Professionals (40) Social support (13) Determination (12) Spirituality (4) Individualized care: Verbal encouragement (4) Lifestyle factors (4) Goals (3) Environment (1)	Medical complications/ comorbidities (4) Unpleasant sensations (3) Age (1)	More care (26) Better care (9) Additional information (8) Elimination of unpleasant sensations (4) Spirituality (3) Social support (2) Policy (1)	Participate (48) Positive attitude (20) Listen to providers (19) Determination (13) Be careful (8) Push through pain (6) Don't worry (4)

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Determination

Participants noted that a major factor facilitating their recovery process was their own determination to once again walk. Participants reported they were determined to exercise and be involved in physical activities as advised by medical professionals both during inpatient rehabilitation and after discharged to home. Examples of related comments included "my determination to walk again," "my mental attitude—never give up," and "my determination to learn and improve." They believed this helped with their entire recovery process.

Lifestyle Factors and Environment

Participants reported that beyond their own beliefs and determination, positive lifestyle activities also facilitated their recovery. Health-promoting behaviors contributing to recovery included eating healthy food, taking appropriate medications and vitamins, and, most importantly, engaging in regular exercise. One participant recognized that an environment that encouraged healthy behaviors (i.e., facilitated physical activity) was important to promote exercise.

Identifying Goals

Participants identified their goals as returning home, regaining independence, and being able to walk like they could before their incident. These goals helped facilitate patients' recovery process.

Factors that Hindered Recovery

Participants who were not satisfied with their functional recovery ($n = 9$) identified a number of factors that hindered the recovery process. Generally, these focused on challenges and unpleasant sensations that participants could interpret to mean they should not or could not participate in rehabilitation activities or recover fully from the hip fracture.

Medical Complications/Comorbidities

A medical complication or underlying disease was perceived as the major barrier to recovery. Complications included surgical complications (such as loosening of hardware) or subsequent falls. Participants did not indicate whether these complications resulted in a medical contraindication that led to their inability to actively engage in rehabilitation or whether the complications resulted in self-imposed restrictions.

Unpleasant Sensations

Several participants reported that pain was a limiting factor in their recovery process that affected rehabilitation participation. Conversely, many participants would recommend to other hip fracture patients that they take their pain medications as prescribed and listen to what healthcare providers say to help relieve pain and encourage rehabilitation.

System Recommendations to Facilitate Recovery

Participants suggested that several system-related factors be changed to facilitate the recovery process. They requested additional physical therapy sessions and nursing care at home following postacute rehabilitation discharge. Some participants also recommended that better and more care be given. Better care was described as meeting with better-qualified surgeons and practitioners who could provide more education about the recovery process. A few participants suggested policy changes to improve care services, provide additional home rehabilitation sessions, and incorporate social supports.

More Care/Better Care

The most common system-related suggestion was to increase the amount of care provided. More care included more direct physical and occupational therapy and more education about the recovery process and ways to optimize physical function after hip fracture. Requests for additional care frequently were related to follow-up and care in the home setting after discharge from inpatient rehabilitation. Better care entailed providers having more training and better emergency management skills.

Spirituality/Social Support

A small number of participants said they would have liked exposure to spiritual support options throughout the course of their rehabilitation program. Similarly, some participants felt that additional social and spiritual supports were needed from family and friends.

Peer Advice and Recovery

Finally, all participants were asked to offer advice they would give patients with new hip fractures to help them with their recovery. Building on their own personal experiences of the recovery process post-hip fracture, they had several recommendations for their peers: 1) stay engaged in the therapy process, 2) do what is recommended by healthcare providers, 3) keep positive and determined to recover, 4) pursue pain management as indicated, and 5) be cautious to prevent future fractures.

Participate and Listen to Healthcare Providers

The most common participant suggestions were to listen to healthcare providers' instructions and participate as much as possible in rehabilitation activities. "Listen to the advice from medical staff such as doctors, therapists, and nurses" and "Do a lot of physical and occupational therapy even if it's painful!" were among participants' suggestions.

Determination and a Positive Attitude

Participants strongly recommended that older adults who sustain hip fractures maintain a positive attitude, avoid worry, and remain determined throughout the recovery process. Some participants suggested, "Keep on trying and never give up," "Sitting around isn't going to help," "Go and exercise!" "Get up and do as much as you can and don't worry," and "Be positive!"

Be Careful

Participants who experienced a hip fracture and the recovery process recommended that others be careful to avoid subsequent trauma and prevent anything that would impede the recovery process. In particular, they voiced warnings to prevent future falls. Participants suggested "Be very careful with recovery and follow all the safety instructions from the medical staff."

Relieve Pain or Work Through Pain

Some participants recommended that patients with new hip fractures take necessary measures to alleviate pain so they could participate optimally in therapy. Other participants suggested that new patients work through their pain. "Do your physical therapy even though it may hurt" and "Use all offered medications that could alleviate pain and relax muscles" were among the suggestions.

Discussion

This study provided insight from the patients' perspectives through the use of in-person interviews 12 months after postacute inpatient rehabilitation. Overall, participants in this study had a positive experience with rehabilitation and attributed their successful recovery to exposure to physical therapy and occupational therapy. The patients recognized and acknowledged that the rehabilitation experience helped them return to their prefracture function and mobility. Previous studies on determinants of functional recovery 1 year after hip surgery vary. Determinants include increasing age, comorbidities, lengthy acute hospital stay, chronic or acute cognitive deficits and depressive symptomatology while hospitalized, worse prefracture ADLs and instrumental ADLs, unsteady gait, and discharge to institution (Koot, Peeters, de Jong, Clevers, & van der Werken, 2000; Young et al., 1997). These studies did not include rehabilitation as a significant predictor of functional recovery.

Rehabilitation alone, however, may not be sufficient for optimal recovery. Participants in this study also attributed their functional recovery to their surgeon's care and support and encouragement from other professional staff. The rehabilitation setting and staff within the setting promote and encourage the rehabilitation

process throughout all care activities (Resnick, Slocum, Ra, & Moffett, 1996). In addition, the care environment had to be conducive to recovery. It is important to assure older adults post-hip fracture that they are in a safe environment with grab bars and hand rails to aid functioning. Personal items must be easily accessible, and pathways must be uncluttered and well lit to encourage optimal functional activities.

Participants in this study reiterated the importance of self-determination and their personal desires to recover. This had been noted previously among older adults in rehabilitation settings (Resnick, 2002) and in the Exercise Plus Program following hip fracture (Resnick et al., 2005). *Self-determination* is the "capacity to choose and to have those choices be the determinants of one's action" (Deci & Ryan, 1985, p. 38). Perceived self-efficacy (Bandura, 2004) is a person's belief that personal action can bring about desired changes. In this study, patients stressed that "determination to walk again," "determination to learn and improve," a "positive attitude," and a "never give up" frame of mind helped their postacute functional recovery. Self-determination and perceived self-efficacy may propel patients to exercise more and comply more fully with instructions given by health professionals, resulting in better functional recovery.

In addition to being determined, participants in this study described being resilient in the face of acute hip fracture. *Resilience* has been described as a person's capacity to make a "psycho-social comeback in adversity" (Kadner, 1989, p.22). Resilience in women older than age 85 is defined as the ability to achieve, retain, or regain a level of physical or emotional health after devastating illness or loss (Felten & Hall, 2001). Resilient people tend to manifest adaptive behavior, especially with regard to social functioning, morale, and somatic health (Wagnild & Young, 1990) and are less likely to succumb to illness (Caplan, 1990; O'Connell & Mayo, 1988). Older women who have successfully recovered from orthopedic or other stressful events have often described themselves as resilient and determined (Felten, 2000; Felten & Hall). Community-dwelling older adults who are resilient were noted to have better function, mood, and quality of life than those who were less resilient (Glantz & Johnson, 1999; Hardy, Concato, & Gill, 2004; Wagnild, 2003). Stressful events such as hip fractures are perceived differently by those who consider themselves to be resilient (Hardy, Concato, & Gill, 2002). This variation in response to stressful events further supports the importance of resilience in the recovery of function and willingness to engage in activities such as rehabilitation.

After professional care and self-determination, patients ranked social support from family and friends as significant in helping with functional recovery. This confirms previous studies that found social support is independently associated with better functional recovery among elderly patients with hip fracture (Roberto,

Key Practice Points

1. Active participation in rehabilitation and following a healthcare professional's instructions greatly contribute to the successful recovery of older adults after hip fracture.
2. To reach optimal functional recovery, a patient's self-determination, positive thinking, and social support play pivotal roles in making rehabilitation work.
3. Fall prevention is an essential aspect in the recovery process.

1992; Young et al., 2005). Better understanding of social support mechanisms at home and in communities can foster functional recovery. Providing information about support mechanisms and patient resources should be integrated into postacute discharge planning.

Participants who were not satisfied with their functional recovery at 1 year reported that factors hindering their functional recovery included older age, medical complications, comorbidities, and unpleasant sensations such as pain. Modifiable barriers such as unpleasant sensations should be anticipated and addressed to optimize the rehabilitation process. Likewise, attempts should be made to prevent commonly noted adverse events after the fracture, such as deep vein thrombosis, pressure ulcers, pneumonia, and urinary tract infections through early mobilization and medical management with appropriate anticoagulation therapy.

When asked about what could improve functional recovery for patients with hip fracture, study participants unanimously said that receiving more information about the rehabilitation process after hip fracture and increasing and extending physical therapy and occupational therapy at postacute inpatient settings would be beneficial. It is possible these respondents needed the support, encouragement, and confidence building they received from the professional staff in the rehabilitation setting on an ongoing basis. Several studies have tested the effect of home-based exercise programs after hip fracture (Mangione & Palombaro, 2005; Resnick, Magaziner, Orwig, & Zimmerman, 2002), and the participants in these studies were willing to engage in additional exercise activities after rehabilitation discharge.

Participants in this study encouraged other patients with hip fracture to be positive, do what they are told to do in the rehabilitation setting, keep working with therapists, and avoid worry. Although this small sample does not represent all patients who have sustained hip fracture, their optimism should be carefully considered. All too often for older adults and their professional and nonprofessional caregivers, hip fractures are perceived as the beginning of a functional and emotional decline. As noted by the participants in this study, recovery can

occur with optimal medical management, the support of professional therapists and other healthcare providers, personal determination, and the support and encouragement of others in the social network.

Functional recovery among older adults with hip fracture is complex and multidimensional. Self-determination, positive attitude, and social support play significant roles in reaching optimal functional recovery.

Limitations

Participants in this study were recruited from the Baltimore metropolitan area; therefore, sociodemographic and geographical variations may limit the generalizability of the findings to other populations or cities. The Rehab&Hipfx study had stringent eligibility criteria because it was designed to evaluate the effectiveness of rehabilitation. Because of these inherent data source limitations, the findings of this study may be applicable only to patients with hip fractures with similar characteristics. Although the study findings were found to be credible with rehabilitation clinicians and researchers, they were not verified with patients who had sustained hip fractures. Finally, because the themes were determined by the interview guide, additional research exploring functional recovery experiences from the perspective of these patients is warranted.

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