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Older Adults With Hip Arthroplasty: An Individualized Transitional Care Program

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Abstract

Background: Most older adults with hip fracture surgery experience functional decline (FD), causing devastating outcomes. However, few studies have examined the effects of nursing interventions to reduce FD for them.

Purpose: The aim of the study was to evaluate an individualized transitional care program (ITCP) to reduce FD for older adults with hip arthroplasty.

Methods: The study was quasiexperimental, with a nonequivalent control group design. A total of 37 participants scheduled for hip arthroplasty were recruited—21 in the experimental and 16 in the control group.

Findings: Two weeks following surgery (i.e., just prior to discharge), the ITCP group displayed less fear of falling than the usual care group. Moreover, the experimental group displayed objectively less FD with increased activities of daily living and Timed Up and Go scores, 6 weeks after hip arthroplasty.

Conclusions: This study provides evidence of the effectiveness of nurse-led rehabilitative practices to reduce FD in older adults with hip arthroplasty.

Clinical Relevance: The ITCP promoted individual physical functioning for older adults with hip arthroplasty. This study results can aid healthy transitions of elderly patients with other various diseases.

Keywords: Functional decline; hip arthroplasty; individualized transitional care program; older adult.

Hip fracture is a primary healthcare issue, especially in the older adult population. Older adults (i.e., 65 or older) accounted for 58,104 (76.4%) of the total 76,100 patients with hip fracture in Korea (Statistics Korea, 2015). Hip fracture in older adults occurs primarily due to simple falls, and older adults with fractures tend to lose bone strength due to osteoporosis and/or other underlying diseases (Handoll, Sherrington, & Mak, 2011). Currently, hip arthroplasty is accepted as a standard treatment for it (Gao, Liu, Xing, & Gong, 2012). However, the complication of physical function in older adults with hip arthroplasty is common throughout hospitalization (Handoll et al., 2011). Older adults who received arthroplasty due to hip fracture displayed functional decline (FD), without recovering their previous level of functioning even 1 year after hip fracture (Córcoles-Jiménez et al., 2015; Vochteloo et al., 2013).

Functional decline is a loss of independent self-care due to a decline in self-care functioning (Boltz, Resnick, Capezuti, Shuluk, & Secic, 2012; Hoogerduijn, Schuurmans, Korevaar, Buurman, & de Rooij, 2010). The consequences of FD in hospitalized older adults include high morbidity, dependency, institutionalization, and mortality (Boltz, Capezuti, & Shabbat, 2011; Boltz et al., 2012; Hoogerduijn et al., 2010). In contrast, the survival rate can be increased by 1 year after arthroplasty if walking is possible within 2 weeks postsurgery (Suh et al., 2012). Therefore, a rehabilitative intervention during hospitalization to reduce FD in older adults with arthroplasty is critical to promote early walking, increase survival rate, and avoid dependency.

Background

Older adults who undergo hip arthroplasty experience a health-to-disease situation, facing hospitalization, surgery, and transition from the hospital environment to their

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homes/communities (Showalter, Burger, & Salyer, 2000). Previous studies have described nursing interventions for older adults with hip arthroplasty during hospitalization, which was defined as an acute care phase, demonstrating improvement in quality of life (Shyu et al., 2013), cognition (Cheng et al., 2012), and a reduction of delirium (Todd, Barry, Hoppough, & McConnell, 2015). However, few studies have identified the effects of these interventions on self-care functions (Murphy et al., 2011; Shyu et al., 2013). This may be because nursing interventions supporting daily living activities were considered low priority during the acute phase of care (Boltz et al., 2012).

According to the middle range theory of transition (Meleis, Sawyer, Im, Hilfinger Messias, & Schumacher, 2000), a transition is not a simple change, but rather a process toward integrating changes into one's existing life (Kralik, Visentin, & van Loon, 2006). The main concepts of transition theory (Meleis et al., 2000) are as follows: types, patterns, properties of transition, transition conditions, nursing therapeutics, and response patterns. Types of transition are classified into developmental, situational, health–disease, and organizational. Transition patterns can be single, multiple, sequential, simultaneous, related, or unrelated. This study includes health–disease transition, which display sequential and related patterns.

Properties of transition comprise awareness, engagement, change/difference, time span, and critical points/events (Meleis et al., 2000). In this study, awareness referred to the recognition of different functions according to hip fracture and surgery. Active participation for healthy transitions was included in engagement. Change and differences referred to functional change between prefracture and postsurgery. Time span was set from hospitalization after hip fracture to discharge. The critical event involved hip fracture in this study.

Transition conditions included individual and environmental conditions that could promote or disrupt a healthy transitional process. In the aforementioned theory, individual conditions include meaning, cultural beliefs/attitudes, socioeconomic status, preparation, and knowledge, whereas environmental conditions include family or healthcare providers' support, role modeling, and fixed ideas of a transitional event by community and society (Meleis et al., 2000). This study considered transitional preparation as knowledge helpful for reducing FD. In contrast, healthcare providers' support and role modeling of older adults experiencing healthy transitions were considered environmental conditions.

Nursing therapeutics consist of assessment, education for the development of adaptive skills, and role supplementation (Meleis et al., 2000). Response patterns, which are the result of a healthy transition, appear with process and outcome indicators. Process indicators consist of feeling connected, interacting, being situated, developing confidence, and coping, whereas outcome indicators include mastery and integrative identities (Meleis et al., 2000). Process and outcome indicators in this study focused on developing confidence, coping, and mastery.

Purpose of the Study

The objective of this study was to evaluate the effects of an individualized transitional care program (ITCP) based on a transitional theory (Meleis et al., 2000). Specifically, the ITCP was aimed at reducing FD in older adults with hip arthroplasty due to hip fracture alone to enable participants to experience healthy transition.

Method

Study Design and Process

This study used a quasiexperimental, pretest–posttest design, with a nonequivalent control group. The institutional review board at a teaching hospital approved this study (2013-12-021). The flow of the study process is reported in Figure 1.

Focus group interviews were conducted with two different groups as part of the development of an ITCP for older adults with hip arthroplasty. All focus group interviews were conducted by the first author who attended qualitative research classes and seminars and had experiences in qualitative research. In the first group, eight elderly patients who received hip arthroplasty and their family caregivers participated in the interview. Questions were based on Meleis' transition theory (Meleis et al., 2000) and were as follows: "Tell us about your experiences during hospitalization, after surgery, and at discharge," "Which factors can reduce or accelerate FD?" and "Tell us ways to promote physical function during hospitalization." Data were collected via audio recording. The complete interview was transcribed verbatim. Then, main concepts, categories, and key themes were identified through a thematic analysis (Kim et al., 2005).

The key themes from the first group were as follows: "FD after hip fracture and surgery" and "factors to reduce or accelerate FD after hip surgery." Most patients expressed nonrecovery of mobility to the prefracture state. Participants recognized that coping after surgery, effective communication with healthcare providers, family support, self-efficacy, and a decrease in fear of falling were important elements to reduce FD (Boltz et al., 2011; Chang, Latham, Ni, & Jette, 2015; Ko & Lee, 2015; Oude Voshaar et al., 2006; Reay, Horner, & Duggan, 2015; Showalter et al., 2000). Results from the focus group interview with the second group were published as a preliminary study on healthcare providers' perceptions of physical function in older adults with hip arthroplasty in *Journal of Muscle and Joint*

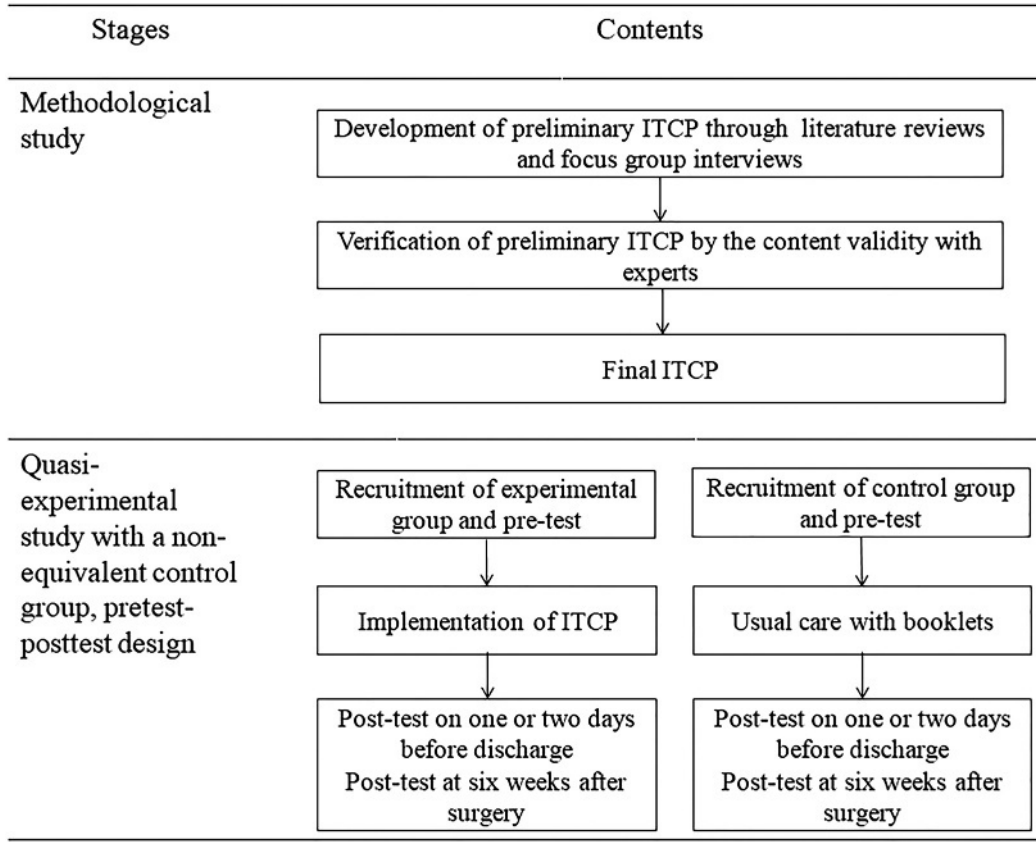

Figure 1. Flow of study process.

Health (Ko & Lee, 2015). The focus group interviews were useful to constitute rehabilitative nursing interventions and to identify appropriate outcome measures.

The final program was confirmed by verifying the content validity with seven experts, including a professor and doctors/nurses involved in the orthopedic field.

Participants

Older adults scheduled for hip arthroplasty were recruited into this study from K university hospital in D city. The sample size was calculated using G*Power software version 3.1.9.2 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany). A sample size of 34 was required to evaluate clear effectiveness in outcome measures. Taking a 10% attrition rate into consideration (Cheng et al., 2012; Shyu et al., 2013), the total sample size was set at 37. Finally, 21 and 16 patients were assigned to the experimental and control groups, respectively. The flow chart of the participants is reported in Figure 2.

Selection criteria included the following: (a) age over 65 years, (b) scheduled for bipolar hemiarthroplasty or total arthroplasty due to one femoral neck fracture, (c) walking before hip fracture with or without an aid, (d) no (<5 points on the Korean version of the Geriatric Depression Scale, GDS-K) or slight risk (5 points ≤ GDS-K score <10 points) of depression, (e) understanding the objectives of this study, and (f) providing informed consent. In contrast, the exclusion criteria were as follows: (a) previous hip arthroplasty; (b) serious neurological diseases, such as stroke or dementia; (c) score below 19 points on the Korean version of the Mini-Mental State Examination; (d) psychiatric history or taking psychiatric drugs that interfered with assessment and/or participation; and (e) participation in another, similar program. The period of this study was from January 14 to December 10, 2014, in D city, Korea.

Experimental Group

We developed an ITCP to recognize each patient separately and provide individualized nursing care according to patients' clinical characteristics such as type of hip arthroplasty, stability of surgical site, and fragility. Through transition theory (Meleis et al., 2000), the ITCP was based on the promotion of transitional properties including active engagement and awareness of changed physical function. In addition, this study considered acquisition of knowledge and supportive environment in transitional conditions to develop the ITCP. In this study, the main transitional points were determined as before and after hip arthroplasty, and before discharge.

The intervention contents were composed of nursing therapeutics, such as assessment, education, supportive

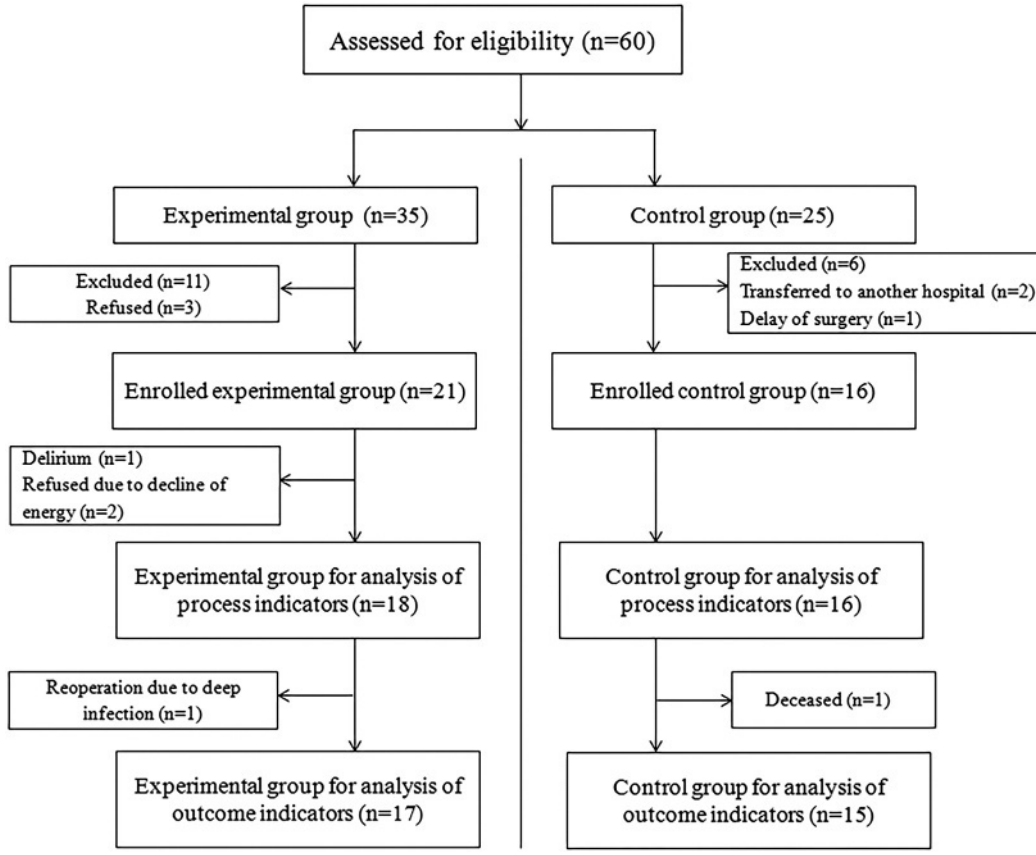

Figure 2. Flow chart of participant.

environment, and role supplementation from transition theory (Meleis et al., 2000). The program was provided 6 times for 2 weeks and was conducted during transitional time points—for example, 1 or 2 days prior to surgery and 1 day after surgery. For each time point, intervention goals were set, and details of the intervention were configured through literature reviews and meaningful data from focus group interviews. Each intervention lasted 40 minutes (i.e., 5-minute assessment, 25 minutes of education, 10 minutes of emotional support and positive reinforcement).

Assessment included pain level, fall risk, awareness of hip surgery, rehabilitative engagement during recovery, and practice of proper exercise technique through observation and face-to-face interviews. Specifically, education contents included pain management, infection management, fall prevention, improving activities of daily living (ADL) through information in a booklet, and step-by-step exercise after surgery, with a demonstration of proper technique. Emotional support and positive reinforcement were provided by listening attentively, advocating, encouraging, and showing older adults experiencing healthy transitions through a video. Every program had its own intervention goal, contents, methods, and resources.

The ITCP was conducted separately, in the patient's room, by one of the researchers and a nurse with experience caring for hospitalized older adults for several years. Prior to initiation of the program, the researcher learned how to implement the study protocol, including exercise from the bed position to walking, provided motivation and encouragement, and recognized complications during the program. The nurse was trained on the exercise protocol and safety measures of the ITCP to help participants repeat exercise daily, that is, from 1 day after hip arthroplasty to right before discharge (Table 1).

Control Group

In the control group, 16 participants received usual postoperative care after all participants in the experimental group were discharged. We also provided them with the booklets that participants in the experimental group received during the program 1 or 2 days before surgery. Baseline characteristics were similar between the two groups as shown in Table 2.

Data Collection

Baseline data were collected at an orthopedic surgery ward 1 or 2 days prior to surgery, using a structured questionnaire. The questionnaire included general characteristics and outcome measures, that is, the process and outcome indicators

Table 1 Individualized transitional care program

Goal	Division	Nursing Components	Contents	Methods	Resources	Time (minutes)
To improve coping of hip arthroplasty with successful transition after operation	1 (1–2 days before operation)	• Assessment • Education • Supportive environment	• Assessment of pain and individual falling risks, assessment of awareness of operation and engagement during recovery • Deep breathing and coughing, bed exercise, pain management, cautions after operation • Offering of appropriate information and emotional support	Observation Face-to-face interview Education Demonstration Therapeutic communication	Questionnaire Booklets	15 15 10
To improve coping of hip arthroplasty	2 (1 day after operation)	• Assessment • Education • Role supplementation	• Checking of pain, deep breathing, leg abduction • Bed exercise, pain management, infection management • Positive reinforcement	Observation Education Therapeutic communication	Booklets	5 25 10
To improve coping and reduce decline of fear of falling, efficacy of functional activities, and ADL	3 (5 days after operation)	• Assessment • Education • Role supplementation	• Checking of pain, exercise, change position • Sitting exercise, taking wheelchair, investigation of risks of falling and education of definition, cause and results of falling • Positive reinforcement	Observation Education Demonstration Therapeutic communication	Booklets	5 25 10
To improve coping and reduce decline of fear of falling, efficacy of functional activities, ADL, and preventive action against falls	4 (6 days of operation)	• Assessment • Education • Role supplementation	• Checking of pain, exercise, change position • Education of standing exercise, falling prevention • Positive reinforcement and introduction of an older adults experienced healthy transition	Observation Education Demonstration Therapeutic communication	Booklets	5 20 15
To improve coping and reduce decline of fear of falling, efficacy of functional activities, ADL, and preventive action against falls	5 (7 days after operation)	• Assessment • Education • Role supplementation	• Checking of pain, exercise, change position • Walking with walker, instructions of preventive actions and environments against falls • Positive reinforcement	Observation Education Demonstration Therapeutic communication	Booklets	5 25 10
To improve coping and ADL for successful transition of discharge	6 (2 days before discharge	• Assessment • Education • Supportive environment	• Checking of pain, exercise, walking • Education of cautions and activities after discharge, infection management, first aid • Emotional support	Observation Education Therapeutic communication	Booklets	5 25 10
To reduce decline of grip strength and circumference of thighs through progressive exercise	1 day after operation-before discharge	• Education • Supportive environment	• Repetition of educated exercise by a trained nurse, motivation • Progressive exercise	Education Demonstration	Booklets A trained nurse	15 – 30

Note. ADL = activities of daily living.

of the transition response patterns according to Meleis' transition theory (Meleis et al., 2000). Process indicators were coping with an artificial hip joint, self-efficacy for functional activities, and fear of falling, whereas fall prevention behaviors, ADL, and the Timed Up and Go (TUG) test were assessed as outcome indicators. Regarding outcome measures of baseline data, we asked participants to recall prefracture status. Data that could not be measured prior to surgery, such as coping with an artificial hip joint and the TUG test, were assessed after surgery only. One or 2 days before discharge, we evaluated the process indicators of transition for the two groups applying the same questionnaire used at baseline. Both groups received the same questionnaires about outcome indicators used at baseline and the TUG test at 6 weeks following surgery at an orthopedic surgery outpatient clinic. Three trained research assistants collected data to maintain data collection consistency.

Outcome Measures of the Transition Response Patterns

Process Indicators of Hip Arthroplasty

Coping with an artificial hip joint. This scale was developed to measure personal recognition of the overall coping skills for an artificial hip joint by Gammon and Mulholland (1996) using the Visual Analog Scale. The marked points were scored in millimeters on a 10-cm straight line. Whereas a score of 100 indicates "completely able to cope with the artificial hip joint," a score of 0 indicates "not able to cope with that at all." The linear analogue scale is a useful and effective tool for measuring the subjective perception of coping by individuals (Gammon & Morgan-Samuel, 2005; Gammon & Mulholland, 1996), and its validity has been verified in various physical and psychological studies (Boonstra, Schiphorst Preuper, Reneman, Posthumus, & Stewart, 2008; House, Arruda, Andrasik, & Grazzi, 2012).

Self-efficacy for functional activities. This scale assesses the degree of individuals' perceived judgment or confidence in their ability to perform each ADL at a given point in time (Resnick, 1999). It consists of nine questions ranging from 0 (*cannot perform at all*) to 10 (*can completely perform*). The final score is the sum of all scores from each question, divided by the number of questions. A higher score indicates higher self-efficacy for functional activities. Validity was supported by a significant correlation in the expected direction between self-efficacy for functional activities and fear of falling (Resnick, 1999). Cronbach's alpha coefficients during the development of the tool ranged from .84 to .92. Cronbach's alpha coefficient for this study was .87.

Fear of falling. The Falls Efficacy Scale (Tinetti, Richman, & Powell, 1990) was developed to measure the degree of being cautious about or avoiding ADLs. This scale has 10 questions, ranging from 1 (*not afraid at all*) to10 (*I avoid because I am very afraid*), and a higher score indicates higher fear of falling. This scale showed good test–retest reliability and high correlation with other measures of fear of falling (Tinetti et al., 1990). The reliability at the time of development was .71. The Cronbach's alpha coefficient for this study was .92.

Outcome Indicators of Hip Arthroplasty Transition

Fall prevention behaviors. The scale of fall prevention behaviors has 14 questions on a dichotomous scale (yes or no) and includes items related to safe environments, tools, walking aids, periodic vision and hearing checkups, taking medications, and drinking alcohol (Hyeon, Park, Park, & Kim, 2010). This scale was originally developed to evaluate a fall prevention program for low-income older adults in a community setting. The scale validity has been reported that fall prevention behaviors were improved significantly after conducting the fall prevention program (Hyeon et al., 2010). A higher score indicates a higher level of fall prevention behaviors. The Cronbach's alpha coefficient according to Hyeon et al. (2010) was .78, and the Cronbach's alpha coefficient in this study was .71.

Activities of daily living. Activities of daily living was assessed using the Korean-Modified Barthel Index (Jung et al., 2007), which was originally developed to measure functional status of individuals with stroke. This scale consists of 10 questions. Scores were divided into five steps, from the first step (cannot be performed) to the fifth step (can be performed independently), with scores ranging from 0 to 100. The higher the score, the higher the independent ADL level of participants. Interrater reliabilities and construct validity of the scale were confirmed through a previous

Table 2 Baseline characteristics between the two groups

	Experimental Group (n = 18)		Control Group (n = 16)	
Variables	Mean (*SD*)	*n* (%)	Mean (*SD*)	*n* (%)
Gender (female)		14 (77.8)		13 (81.3)
Age	75.50 ± 3.70		77.94 ± 5.37	
Marital status (bereavement)		8 (44.4)		11 (68.8)
Living together family		12 (66.7)		11 (68.8)
Education (<elementary school graduation)		16 (88.9)		15 (93.8)
Job (no)		16 (88.9)		13 (81.3)
Chronic diseases (number)	2.56 ± 0.51		2.19 ± 0.54	
Medication (number)	2.27 ± 0.67		2.25 ± 0.58	
Fractural cause (falling)		15 (83.3)		16 (100)
Frequency of falling	1.50 ± 0.92		1.56 ± 0.81	
Type of hip arthroplasty (bipolar hemiarthroplasty)		16 (88.9)		13 (81.3)

study (Jung et al., 2007). The Cronbach's alpha coefficient was .84 during development and .92 in this study.

Timed Up and Go. The TUG, which was developed to test functional mobility of frail older adults by Podsiadlo and Richardson (1991), measures the time in seconds a participant takes to get up from a chair with armrests, walk a 3-m distance, and come back to sit in the chair. If the time taken to accomplish this task exceeds 30 seconds, this indicates that the subject cannot walk outdoors by himself or herself and is physically dependent. The TUG test is a useful tool to objectively measure FD and is reliable and valid (Wells & Wade, 2013).

Data Analysis

All data were analyzed using SPSS, version 22.0 software (SPSS, Inc., Chicago, IL). Baseline characteristics were examined with descriptive statistics. The homogeneity of the transition response patterns between experimental and a control group was analyzed using a Fisher's exact test and Mann–Whitney *U* test. Mean differences in the transition response patterns between the study groups across the two time points were compared using repeated-measures analysis of variance. When there was a difference with respect to baseline data of the transition response patterns between the study groups, analysis of covariance was used for analysis. The difference of indicators measured after intervention was tested using Fisher's exact and Mann–Whitney tests. The level of significance was set at .05.

Results

Homogeneity of the Transition Response Patterns Between the Experimental and Control Groups

There was no significant difference between the two groups in transition response patterns, except the fear of falling ($p < .01$) and fall prevention behaviors ($p < .01$).

Effects of the ITCP on the Transition Response Patterns

Results of the process indicators 1–2 days before discharge. Results of the process indicators showed that fear of falling showed significant differences between the two groups ($p = .002$), demonstrating that fear of falling in the control group increased more than in the experimental group. The coping level of participants measured only before discharge was 58.22 and 42.96 points for the experimental and control groups, respectively, which was not statistically significant ($p = .055$). The mean self-efficacy toward functional activities between the groups was significantly different ($p = .011$), and these scores were also significantly different between the study time points ($p < .001$). However, the interaction effect between time and group was not significant ($p = .282$). That is, the experimental and control groups had no significant difference in self-efficacy toward functional activities between prefracture and postintervention (1–2 days before discharge).

Results on the outcome indicators 6 weeks after surgery. The ITCP in this study was effective to reduce the decline of ADL and TUG scores. The difference of ADL between prefracture and postintervention was 14.22 points in the experimental group and 34.07 points in the control group. The mean difference between the groups for ADL was significant ($p < .001$), and the ADL scores were significantly different between the two time points ($p < .001$). The interaction between time and group was significant ($p = .003$), namely, the experimental and control groups were significantly different in ADL scores between prefracture and postintervention (6 weeks after surgery).

TUG was measured at 6 weeks after surgery. The TUG score of all participants in the experimental group was below 30 seconds and the mean was 19.41 seconds, whereas 33.3% of participants in the control group exceeded 30 seconds and 20% could not walk at all. Furthermore, groups divided into under 30 seconds and 30 seconds or more for the TUG score showed a significant difference ($p = .015$). Fall prevention behavior in the analysis of covariance analysis displayed no statistically significant result between the two groups in the mean difference ($p = .739$). The results of the transition response patterns are presented in Tables 3 and 4.

Discussion

The current study examined an ITCP developed for older adults with hip arthroplasty to facilitate the experience of healthy transitions based on transition theory (Meleis et al., 2000). The results suggest that the ITCP to reduce FD as part of the healthy transition of older adults receiving hip arthroplasty was effective overall. In this chapter, we will discuss the specific effects of the ITCP on transition response patterns.

The ITCP was effective in reducing the typical increase in the fear of falling observed before discharge ($p = .002$). Hip fracture in older adults has been associated with fear of falling, and fear of falling has been shown to negatively influence functional recovery (Crotty et al., 2010; Scheffers-Barnhoorn et al., 2017). A previous study (Oude Voshaar et al., 2006) found that fear of falling in 291 patients predicted physical functional status after 6 months. Therefore, reduction in the fear of falling as a process indicator on transition response patterns (Meleis et al., 2000) may be a key intervention during the early rehabilitative period after hip arthroplasty.

In this study, there were no statistically significant differences in coping with an artificial hip joint ($p = .055$) or

self-efficacy for functional activities (p = .282) between the two groups of process indicators based on Meleis' transition theory (Meleis et al., 2000). Although we could not find previous studies to compare our results, Reay et al. (2015) found that coping with hip arthroplasty was easier in older adults than in younger patients, because older individuals tended to have been less active prior to the hip fracture. These inactive lifestyles might make older adults more adaptable in their physical restrictions after hip arthroplasty. Through this result, further development of a validated tool is necessary for older adults to recognize not only precautions of physical limitations but also effective coping management after implantation of an artificial hip joint.

In addition, the direct effect of self-efficacy on functional activity reported here is similar to results presented by Chang et al. (2015). Specifically, self-efficacy slightly decreased from baseline to 6 months after a function-oriented rehabilitation program, while it increased from 6 to 9 months. Although self-efficacy has been shown to be a significant factor related to functional recovery of older adults with hip arthroplasty (Singh et al., 2012), these effects may take longer for improvements to be observed. Thus, future longitudinal studies are needed to investigate the long-term effects of a rehabilitative intervention incorporating self-efficacy.

Fall prevention behaviors, ADL, and TUG for outcome indicators on transition response pattern (Meleis et al., 2000) were evaluated 6 weeks after surgery. There was no effect (p = .739) on fall prevention behaviors after intervention when compared to previous studies (Hyeon et al., 2010; Yoo, Jeon, & Kim, 2013). A possible reason for this could be related to the lack of appropriate methods to educate older adults. Fall prevention education in this study was partially included in the ITCP and was conducted using a booklet. Previous studies by Hyeon et al. (2010) and Yoo et al. (2013) described fall prevention education performed 20 minutes at a time using a repeated explanation and images/videos for hard-to-explain items. Therefore, it might be necessary to incorporate repeated education with visual aids to increase fall prevention behaviors.

The experimental group showed significantly better ADL (p = .003) and TUG (p = .015) scores compared to

Table 4 Effect of TUG by an individualized transitional care program (N = 32)

	Exp. (n = 17)	Cont. (n = 15)	
Variables	n (%)	n (%)	p
TUG			
≤20	11 (64.7)	6 (40)	
21–30	6 (35.3)	4 (26.7)	
31–40		1 (6.7)	
>100		1 (6.7)	
Can't walk		3 (20.0)	
≤30[a]	17 (100)	10 (66.7)	.015*
>30[a]		5 (33.3)	

Note. TUG = Timed Up and Go.
[a]Fisher's exact test.
*p < .05.

Table 3 Effects of process (n = 34) and outcome indicators (n = 32) by an individualized transitional care program

			Exp. (n = 18)	Cont. (n = 16)			
Classification	Variables	Time	Mean ± SD	Mean ± SD	Source	t or F	p
Process indicators	Coping[a]	Posttest	58.22 ± 14.73	42.96 ± 22.36		−1.94	.055
	Self-efficacy for functional activities	Pretest	9.44 ± 0.92	8.58 ± 1.41	Group	7.21	.011*
		Posttest	5.31 ± 0.65	3.70 ± 2.61	Time	158.65	<.001**
		Difference	−4.14 ± 1.63	−4.87 ± 2.52	G*T	1.20	.282
	Fear of falling[b]	Pretest	19.39 ± 16.15	36.19 ± 19.25		11.67	.002**
		Posttest	43.22 ± 22.64	72.38 ± 21.19			
		Difference	23.83 ± 29.35	36.19 ± 26.86			
			Exp. (n = 17)	Cont. (n = 15)			
Classification	Variables	Time	Mean ± SD	Mean ± SD	Source	t or F	p
Outcome indicators	Preventive actions against falls[§]	Pretest	23.78 ± 2.29	26.12 ± 1.75			
		Posttest	25.47 ± 1.81	26.20 ± 1.37		0.11	.739
		Difference	1.88 ± 2.60	0.13 ± 1.77			
	ADL	Pretest.	99.28 ± 1.74	91.31 ± 13.70	Group	20.42	<.001**
		Posttest	90.06 ± 9.76	56.67 ± 30.85	Time	30.37	<.001**
		Difference	−14.22 ± 23.60	−34.07 ± 30.51	G*T	10.07	.003**

Note. Exp. = experimental group; Cont. = control group; G*T = Group * Time; ADL = activities of daily living.
[a]Mann–Whitney test.
[b]Analysis of covariance.
**p < .01.

the control group. This is especially evident in the TUG score of the experimental group, as all were below 30 seconds, indicating recovery from their mobility impairments. The results were similar to previous studies (Shyu et al., 2013). The improvement in ADL and TUG scores may have been the result of the walking that was performed in this program. Participants were encouraged to walk as soon as possible after hip arthroplasty, which resulted in overall improved physical recovery. For older adults, high performance of ADL can be defined as a health indicator (Wells & Wade, 2013). Thus, evaluation of ADL and TUG for mastery of outcome indicators in Meleis' transition theory (Meleis et al., 2000) should be considered as core measures in this study.

The ITCP reduced FD during the transitional periods for older adults with hip arthroplasty in acute care hospitals, not long-term care facilities. In acute care hospitals, nursing care to promote ADL and exercise for older adults with hip fracture surgery is underestimated (Boltz et al., 2012). Therefore, nurses need to recognize the severity of FD and the importance of rehabilitative strategies for healthy transition.

Limitations

There were some limitations of the current study. First, this study used a quasiexperimental design and did not consider variables that may have limited internal validity, such as nutritional status or hospitalization period of emergency room. Second, only a small number of participants took part in this program due to restrictions to a specific health condition. Therefore, people with diverse underlying disease and frailty were not considered. For this reason, we cannot generalize these findings based on this study alone. Lastly, we excluded older adults whose cognitive function was decreased or who demonstrated clinical depression. Thus, we cannot draw any conclusion for these groups.

Implications for Research

This study might contribute to evidence-based nursing practice that the ITCP was effective in reducing FD and was based on transition theory (Meleis et al., 2000). It can promote the development of studies to aid healthy transitions of elderly patients with other various diseases. In addition, we evaluated only outcome variables at discharge and 6 weeks after surgery. Continued research paralleled more closely with this study is needed to investigate the long-term effects.

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References

Boltz, M., Capezuti, E., & Shabbat, N. (2011). Nursing staff perceptions of physical function in hospitalized older adults. *Applied Nursing Research, ANR*, *24*(4), 215–222. doi:10.1016/j.apnr.2010.01.001

Boltz, M., Resnick, B., Capezuti, E., Shuluk, J., & Secic, M. (2012). Functional decline in hospitalized older adults: Can nursing make a difference? *Geriatric Nursing*, *33*(4), 272–279. doi:10.1016/ j.gerinurse.2012.01.008

Boonstra, A. M., Schiphorst Preuper, H. R., Reneman, M. F., Posthumus, J. B., & Stewart, R. E. (2008). Reliability and validity of the visual analogue scale for disability in patients with chronic musculoskeletal pain. *International Journal of Rehabilitation Research*, *31*(2), 165–169. doi:10.1097/MRR. 0b013e3282fc0f93

Chang, F. H., Latham, N. K., Ni, P., & Jette, A. M. (2015). Does self-efficacy mediate functional change in older adults participating in an exercise program after hip fracture? A randomized controlled trial. *Archives of Physical Medicine and Rehabilitation*, *96*(6), 1014–1020.e1.

Cheng, C. M., Chiu, M. J., Wang, J. H., Liu, H. C., Shyu, Y. I., Huang, G. H., & Chen, C. C. (2012). Cognitive stimulation during hospitalization improves global cognition of older Taiwanese undergoing elective total knee and hip replacement surgery. *Journal of Advanced Nursing*, *68*(6), 1322–1329. doi:10.1111/j.1365-2648.2011.05842.x

Córcoles-Jiménez, M. P., Villada-Munera, A., del Egido-Fernández, M. Á., Candel-Parra, E., Moreno-Moreno, M., Jiménez-Sánchez, M. D., & Piña-Martínez, A. (2015). Recovery of activities of daily living among older people one year after hip fracture. *Clinical Nursing Research*, *24*(6), 604–623. doi:10.1177/1054773815573261

Crotty, M., Unroe, K., Cameron, I. D., Miller, M., Ramirez, G., & Couzner, L. (2010). Rehabilitation interventions for improving physical and psychosocial functioning after hip fracture in older people. *The Cochrane Database of Systematic Reviews*, (1), CD007624. doi:10.1002/14651858.CD007624.pub3

Gammon, J., & Morgan-Samuel, H. (2005). A study to ascertain the effect of structured student tutorial support on student stress, self-esteem and coping. *Nurse Education in Practice*, *5*(3), 161–171. doi:10.1016/j.nepr.2004.09.003

Gammon, J., & Mulholland, C. W. (1996). Effect of preparatory information prior to elective total hip replacement on post-operative physical coping outcomes. *International Journal of Nursing Studies*, *33*(6), 589–604. doi:S0020748996000193

Gao, H., Liu, Z., Xing, D., & Gong, M. (2012). Which is the best alternative for displaced femoral neck fractures in the elderly?: A meta-analysis. *Clinical Orthopaedics and Related Research*, *470*(6), 1782–1791. doi:10.1007/s11999-012-2250-6

Handoll, H. H., Sherrington, C., & Mak, J. C. (2011). Interventions for improving mobility after hip fracture surgery in adults. *The Cochrane Database of Systematic Reviews*, (3), CD001704. doi:10.1002/14651858.CD001704.pub4

Hoogerduijn, J. G., Schuurmans, M. J., Korevaar, J. C., Buurman, B. M., & de Rooij, S. E. (2010). Identification of older hospitalised patients at risk for functional decline, a study to compare the predictive values of three screening instruments. *Journal of Clinical Nursing*, *19*(9–10), 1219–1225. doi:10.1111/ j.1365-2702.2009.03035.x

House, E. D., Arruda, J. E., Andrasik, F., & Grazzi, L. (2012). The reliability and validity of the visual analog mood scales in non-English-speaking pain patients. *Pain Practice: The Official Journal of World Institute of Pain*, *12*(8), 626–632. doi:10.1111/j.1533-2500.2012.00544.x

Hyeon, I. S., Park, M. H., Park, K. M., & Kim, C. N. (2010). The effects of a fall prevention program on the low-income elderly at risk of falls. *Journal of the Korean Academy of Community Health Nursing*, *21*(2), 200–209.

Jung, H. Y., Park, B. K., Shin, H. S., Kang, Y. K., Pyun, S. B., Paik, N. J., … Han, T. R. (2007). Development of the Korean version of

modified Barthel Index (K-MBI): Multi-center study for subjects with stroke. *Annals of Rehabilitation Medicine*, *31*(3), 283–297.

Ko, Y. J., & Lee, J. H. (2015). Health care providers' perceptions of physical function in older adults with arthroplasty from hip fracture. *Journal of Muscle and Joint Health*, *22*(2), 67–77.

Kim, G. B., Shin, K. R., Kim, S. S., Yoo, E. K., Kim, N. C., Park, E. S., Hyun, M. S. (2005). *Qualitative research methodology*. Seoul, South Korea: Hyunmoonsa.

Kralik, D., Visentin, K., & Van Loon, A. (2006). Transition: A literature review. *Journal of Advanced Nursing*, *55*(3), 320–329.

Meleis, A. I., Sawyer, L. M., Im, E. O., Hilfinger Messias, D. K., & Schumacher, K. (2000). Experiencing transitions: An emerging middle-range theory. *Advances in Nursing Science*, *23*(1), 12–28.

Murphy, S., Conway, C., McGrath, N. B., O'Leary, B., O'Sullivan, M. P., & O'Sullivan, D. (2011). An intervention study exploring the effects of providing older adult hip fracture patients with an information booklet in the early postoperative period. *Journal of Clinical Nursing*, *20*(23–24), 3404–3413. doi:10.1111/j.1365-2702.2011.03784.x

Oude Voshaar, R. C., Banerjee, S., Horan, M., Baldwin, R., Pendleton, N., Proctor, R., … Burns, A. (2006). Fear of falling more important than pain and depression for functional recovery after surgery for hip fracture in older people. *Psychological Medicine*, *36*(11), 1635–1645. doi:S0033291706008270

Podsiadlo, D., & Richardson, S. (1991). The timed "up &go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society*, *39*(2), 142–148.

Reay, P. A., Horner, B., & Duggan, R. (2015). The patient's experience of early discharge following total hip replacement. *International Journal of Orthopaedic and Trauma Nursing*, *19*(3), 131–139.

Resnick, B. (1999). Reliability and validity testing of the self-efficacy for functional activities scale. *Journal of Nursing Measurement*, *7*(1), 5–20.

Scheffers-Barnhoorn, M. N., van Haastregt, J. C., Schols, J. M., Kempen, G. I., van Balen, R., Visschedijk, J. H., … van Eijk, M. (2017). A multi-component cognitive behavioural intervention for the treatment of fear of falling after hip fracture (FIT-HIP): Protocol of a randomised controlled trial. *BMC Geriatrics*, *17*(1), 71.

Showalter, A., Burger, S., & Salyer, J. (2000). Patients' and their spouses' needs after total joint arthroplasty: A pilot study. *Orthopaedic Nursing*, *19*(1), 49–62.

Shyu, Y. I., Liang, J., Tseng, M. Y., Li, H. J., Wu, C. C., Cheng, H. S., … Yang, C. T. (2013). Comprehensive and subacute care interventions improve health-related quality of life for older patients after surgery for hip fracture: A randomised controlled trial. *International Journal of Nursing Studies*, *50*(8), 1013–1024. doi:10.1016/j.ijnurstu.2012.11.020

Singh, N. A., Quine, S., Clemson, L. M., Williams, E. J., Williamson, D. A., Stavrinos, T. M., … Smith, E. U. (2012). Effects of high-intensity progressive resistance training and targeted multidisciplinary treatment of frailty on mortality and nursing home admissions after hip fracture: A randomized controlled trial. *Journal of the American Medical Directors Association*, *13*(1), 24–30.

Statistics Korea. (2015). *National health insurance statistics*. Retrieved from http://kosis.kr/statHtml/statHtml.do?orgId=350&tblId=TX_35001_A061&vw_cd=&list_id=&scrId=&seqNo=&lang_mode=ko&obj_var_id=&itm_id=&conn_path=K1&path=

Suh, Y. S., Kim, Y. B., Choi, H. S., Yoon, H. K., Seo, G. W., & Lee, B. I. (2012). Postoperative mortality and the associated factors in elderly patients with hip fracture. *Journal of the Korean Orthopaedic Association*, *47*(6), 445–451.

Tinetti, M. E., Richman, D., & Powell, L. (1990). Falls efficacy as a measure of fear of falling. *Journal of Gerontology*, *45*(6), P239–P243.

Todd, K. S., Barry, J., Hoppough, S., & McConnell, E. (2015). Delirium detection and improved delirium management in older patients hospitalized for hip fracture. *International Journal of Orthopaedic and Trauma Nursing*, *19*(4), 214–221.

Vochteloo, A. J., Moerman, S., Tuinebreijer, W. E., Maier, A. B., de Vries, M. R., Bloem, R. M., … Pilot, P. (2013). More than half of hip fracture patients do not regain mobility in the first postoperative year. *Geriatrics & Gerontology International*, *13*(2), 334–341.

Wells, M., & Wade, M. (2013). Physical performance measures: An important component of the comprehensive geriatric assessment. *The Nurse Practitioner*, *38*(6), 48–53. doi:10.1097/01.NPR.0000429895.41373.7e

Yoo, J. S., Jeon, M. Y., & Kim, C. G. (2013). Effects of a fall prevention program on falls in frail elders living at home in rural communities. *Journal of Korean Academy of Nursing*, *43*(5), 613–625.