

Factors Predicting Functional Ability among Older Adults undergoing Hip and Knee Arthroplasty

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Abstract: Total joint arthroplasty is a standard surgical procedure for reducing chronic joint pain and improving functions and quality of life among older adults with osteoarthritis. Preoperative patient expectations of surgical treatment and care transitions are vital concerns involving postoperative recovery. This prospective cohort study examined factors predicting functional ability at two-week post operation in older adults undergoing hip and knee arthroplasty. Ninety-five participants scheduled for total joint arthroplasty should be: hip and knee completed questionnaires, which included the Demographic and Health Information Questions, Functional Ability Improvement Expectation Questionnaire, Care Transition Measure-15, and Modified Barthel Activities of Daily Index. The data were analyzed by using descriptive statistics, Pearson's coefficient correlation, and hierarchy regression analysis.

Results showed that the participants had a high level of functional ability. Functional ability improvement expectation and quality of care transition were positively related to functional ability, whilst patients' characteristics were not significantly correlated to functional ability. The main subscales of functional ability improvement expectation: walking ability, social participation, and quality of care transition: management preparation, were the predictors, which jointly explained 36.9% of variance in functional ability. These findings may help nurses to develop interventions focusing on helping patients to develop realistic expectations about functional ability after total joint arthroplasty. This involves particularly walking ability and social participation, and coordinating patient care among patients and their families along with health care team in order to set appropriate management preparation for older adults undergoing total joint arthroplasty, and ultimately to improve quality of nursing care and enhanced clinical outcomes.

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Introduction

Severe osteoarthritis is a common problem in older adults and is a major cause of disability due to pain and mobility limitation.^{1,2} Total joint arthroplasty

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(TJA) involving both hip and knee is known as a successful and cost-effective surgical procedure used in gold standard treatment of severe osteoarthritis and other hip conditions, such as hip fracture or avascular necrosis of the hip.^{3,4} Even after complete TJA, some patients may have unsatisfactory outcomes,⁵ but there is often improvement of functional ability and physical performance (stiffness and range of motion) as well as pain relief. Several factors namely personal characteristics (i.e. age, comorbidities, and obesity) and preoperative function, which influences functional ability or clinical outcomes postoperatively, have been documented.⁶⁻⁹ Among these, patients' expectation in regaining normal functional ability after surgery is one of many reasons for patients to seek TJA treatment. This expectation is currently known to be associated with better outcomes and acts as an independent predictor of improved physical function and pain reduction in persons with total joint arthroplasty (PWTJA).^{5,10}

Evaluating quality of care transition across care settings has been applied to assure effective care, and quality care outcomes were reported as well.¹¹ A proactive discharge plan for better transition care requires the coordination and continuity of care as well as support including in-home follow-up which is essential to improve quality of clinical outcomes.^{11,12} Focusing on quality of care transition is imperative for patient's clinical outcomes, interdisciplinary treatment goals, and health policy enactment. Admittedly, monitoring a trajectory of patient recovery from surgery is not only crucial as it would give information to patients when they can expect to return to normal activity of daily life, but is also essential to orthopedists and policymakers to plan treatment and care for these patients properly. Yet, how to evaluate and what is the practical timeline to justify quality of surgical care is even more challenging. Previous studies reveal that the functional improvement from TJA was seen within the first three months and continued up to 12 months postoperatively.¹³⁻¹⁵ These results may reflect an appropriate time period to measure clinical outcomes,

although a gap exists in which some immediate complications may not be definitely identified. The timely basis to measure outcomes after hip and knee arthroplasty were based on particular clinical consensus (i.e. clinical failure or radiographic), which might less focus on the normal postoperative recovery pattern^{10,14} starting immediately after surgery. The World Health Organization (WHO) emphasizes a priority goal of 2025 that early detection is significant to enhance quality of care.¹⁶ Thus, detecting deviant functional performance on a timely recovery pattern is practicable and critical to improving continuing care. This study attempted to verify the immediate assessment of two-week follow-up after TJA. An immediate outcome would be valuable information for bridging the gap of care and develop holistic care plans and treatment for improvement of functional ability in this population. Therefore, the study aimed to examine factors predicting functional ability in PWTJA at the 2-week postoperative follow-up.

Conceptual Framework and Review of Literature

Regaining postoperative functional ability has been considered as an outcome indicator to justify care quality in PWTJA both hip and knee arthroplasty. To assess quality of surgical care, the renowned framework known as the Donabedian model¹⁷, was used to evaluate the quality of continuing care. Basically, the model describes the association among three constructs: structures of care (i.e. characteristics of setting, workforce characteristics), process of care (i.e. nursing intervention for patient education, and coordination of care including discharge planning), and health outcomes (quality of life, and patient ability to function in daily activity). According to the model, good structure of care should lead to the likelihood of good process of care, which should in turn increase likelihood of good health outcomes.¹⁸

Evidence has been documented that the model was a valuable framework in assessing care quality, such as surgical and trauma care quality.^{19,20} For structure of care, it was the attributes of settings—material, human, and organization—where the care occurred.¹⁷ Thus, human attributes such as the characteristics of patients was included in the structure of care, which was separated from other structures of care to possibly increase the linkage of structure–process–outcome²¹ as a previous study underlined that patient needs and values are recognized as a dimension of care quality.²² For other attributes of structure of care (material and organization), the clinical care pathway may play an important role in controlling hospital facilities, multidisciplinary roles, and surgical treatments, which influence patient expectations, process of care, and postoperative health outcomes. As care for TJA is provided (hip arthroplasty: THA and knee arthroplasty: TKA), the patient moves along the continuing care delivery. In the selected clinical setting of this study, those who underwent TJA were planned to discharge home based on the clinical pathway. Briefly, the clinical pathway designed for TKA included the role of nurses and orthopedists taking care of patients during hospital admission on the preoperative day to 4 days postoperatively. For the THA, the clinical pathway included 7 days of hospital stay from preoperative to discharge, with 5 days postoperative. For example, nurses are responsible for preparing patient readiness and safety for operation and enhancing patient post–operative recovery (i.e. complete nursing assessment, preoperative teaching, pain management, and discharge planning including home and environment safety), whilst orthopaedists play an important role such as ordering preoperative laboratory tests, review care plans with patients, families, and nurses, and prescribe antibiotics used during operation. These activities were given to patients on the preoperative day. Besides the implementation of clinical pathways, the discharge process was planned by the multidisciplinary

team including a primary care nurse, who was responsible for taking care of the patient during admission, clinical pharmacists, home health care nurses, and orthopedists. Since most PWTJA are older adults, functional decline during hospitalization together with comorbidities may result in vulnerability to unsatisfactory transition and poor clinical outcomes. Additionally, as clinical pathways were specifically designed for a single disease or condition, it may worsen or deteriorate health outcomes in older adults with coexisting conditions.²³ This was consistent with previous studies which revealed that age, comorbidity, and being overweight or obese were the predictive factors of functional ability in PWTJA.^{8,24, 25} Moreover, the pre–operative functional status was one of the significant predictors in predicting excellent outcome in patients with hip arthroplasty.⁹

However, patient expectation was found to be a vital factor related to functional outcome among PWTJA. Generally, patient expectations were defined as desires, needs, and requests resulting from medical care.²⁶ As the patient expectation was one of patient’s psychological factors contributing to the success of post–operative functional recovery and rehabilitation, several studies revealed the association between patient expectations and health outcomes including functional ability postoperatively. For example, the patients who had high pre–operative expectations of postoperative outcomes revealed an association with the postoperative improvement of patient–reported outcome measures compared to those who had lower expectations.¹⁰ Additionally, a higher rating of expectations showed a correlation with a lesser improvement in pain from preoperative to three–month postoperative assessment in PWTJA. Also, a higher rating of expectations had an association with a greater improvement in functions at six–month postoperatively of TKA.²⁷ However, inconsistent findings were found as there was not a significant correlation between the level of preoperative expectations and clinical outcomes at less than 6 weeks to 12 months

postoperatively.^{28, 29} Preoperative expectations may result in different postoperative outcomes at different time intervals after TJA. As mentioned above, patient expectations were focused on functional ability improvement expectation after TJA in this study. Therefore, patients' characteristics including age, comorbidity, body mass index, pre-operative physical function, and functional ability improvement expectation were selected under the structure of care to determine the directional association with the process of care and health outcome – functional ability in this study.

In process of care, to provide perioperative care; quality of care transition as care delivery during admission to discharge home and care coordination, which includes multidisciplinary care team, are important to modify and potentially mitigate the characteristics of patients who are at risk for surgery through standardization of care. Previous studies indicated that improving coordination of discharge process through education for patients/caregiver and post discharge follow-up resulted in decreasing adverse health outcomes such as readmissions after TJA.^{30,31} Notably, incorporating characteristics of patients and quality of care transition into the Donabedian model leads to better understanding and improvement in functional ability among patients with TJA, which is one of clinical outcomes that have been focused over recent years.³² Evidence from previous studies reveals a robust positive association among structure of care, process of care, and health outcomes in hospitalized patients and traumatic patients^{20,33}, although there are limited studies conducted in Thai TJA. Development of any practical interventions for promoting postoperative health outcomes should be designed to align patient expectations on clinical outcomes that are supported by evidence. This will lead to appropriate management of healthcare providers and decision making of surgery in patients who primarily would not have undergone TJA. Importantly, applying specific quality of care framework is also necessary for better understanding and exploring the continuing care gap in this population.

Methods

Research Design: A prospective cohort study.

Sample and Setting: Ninety-eight consecutive older adults scheduled for hip and knee arthroplasty were enrolled at a university hospital in Bangkok, Thailand. Older adults were recruited in this study if they were: aged 60 years and over; scheduled for hip and knee arthroplasty for the first time; and able to communicate in Thai. The exclusion criteria comprised older adults who had a history of cognitive impairment or psychiatric disorders, admitted to intensive care unit postoperatively due to uncontrolled health problems, developed any postoperative complications (i.e. cognitive alteration, re-operation), and were not able to be discharged to home as the clinical pathway. The sample size was calculated by using G*Power program. To determine a suitable sample size for multiple regression analysis, a small effect size of .20, a power of .80, an alpha of .05, and 11 predictors were used for sample size calculation. The sample sizes needed were 95 individuals. Since this study was a prospective correlational study, a dropout rate of 10% was added, so the required samples were 105 individuals.

Ethical Consideration: After approval was obtained from the Ethical Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand, (ID 05-57-04), the older adults who met the inclusion criteria were approached by well-trained orthopedic nurses (RNs). Participants were informed of the study objective and procedures and their right to refuse to participate or withdraw at any time without detriment to their care and treatment. There were no harmful or life-threatening risks in this study, while the minor risks to participants such as breach of confidentiality, discomfort, and inconvenience of completing questionnaires along with benefits to participants and/or society were informed. All their identities were assured to be kept confidential. An informed consent form was distributed to each participant; and written agreement was obtained before the

questionnaires were administered. In case, the participants had visual impairment, verbal agreement to participate in the study was legally accepted.

Instruments: Four instruments were used:

Demographic and Health Information Questionnaire.

This was designed to gain information related to participants' characteristics (age, educational level, healthcare payment) and health information (body mass index, fall history, types of surgery, pre-operative physical functional).

Functional Ability Improvement Expectation Questionnaire. A 15-item questionnaire was used to evaluate patient expectations of functional ability improvement at post-surgery. It was developed by the researchers based on a literature review and patient focused-interviews (10 PWTJA). This questionnaire was designed to gain information regarding patient expectations of post-surgical functional ability improvement after hip or knee arthroplasty. The questionnaire comprises 3 main subscales of function ability representing patient expectations of post-surgical function: 1) walking ability (4 items; i.e. improved ability to take a long distance walk, improved ability to walk without a walking aid), 2) symptom reduction (6 items; i.e. ability to make leg straight, relieve joint pain that interferes with sexual ability), and 3) social participation (5 items; i.e. ability to participate in religious activities, ability to participate in social activities such as elderly club or meeting with friends). The rating score for each item ranges from 0 (no expectation) to 3 (high expectation). Each subscale had unequal items, so the sum scores were divided by the numbers of items to get the total score which ranged from 0-3 on each subscale, and the higher scores indicated higher patient expectations of functional ability improvement after TJA. Content validity was verified by three experts (an orthopaedist, orthopaedic advanced practice nurse, and an experienced instrument developer) and a CVI of .93. For reliability Cronbach's alpha tested with 10 PWTJA in a pilot study was .76 and in the main study of 95 participants, the Cronbach's alphas for overall scale, walking ability subscale, symptom reduction subscale, and social participation subscale

were .71, .65, .73, and .75, respectively.

Care Transition Measure -15 (CTM-15).

The CTM-15 was developed by Coleman³⁴ to assess quality of care transition from hospital to home perceived by the study participants. It comprises 15 items (for example, 'the hospital staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left the hospital') with four subscales, critical understanding, important preferences, management preparation, and care plan.³⁵ Each item uses a 5-point Likert scale of strongly disagree, disagree, agree, strongly agree, and don't know/don't remember/not applicable. The respondent scores range from 1 (strongly disagree) to 4 (strongly agree). Regarding the last scale (don't know/don't remember/not applicable), this is not counted as an answered question and not calculated for contributing to the CTM score. A linear transformation of mean scores was performed to obtain a 0-100 score. Higher scores reflect a higher quality of care transition. The CTM-15 has demonstrated good reliability in various populations with Cronbach's alpha reliability ranging from .93 to .95.³¹ After receiving permission by the owner, the original version was translated into Thai by the standard translation method³⁶, the content validity was assessed by two experts (CVI = .91), and a pilot testing was conducted before administrating in this study. Cronbach's alpha reliability in this study was .74.

Modified Barthel Activities of Daily Index (MBAI). The MBAI-Thai version of Jitapunkul et al.³⁷

was employed to measure functional ability of the study participants. The MBAI-Thai version is a 10-item questionnaire asking about activities such as feeding, toilet use, transferring, and going up and down stairs (for example, transferring: ability to transfer from bed to chair or wheelchair). Each item contains different scores according to its difficulties. Total score ranges from 0 to 20. Because data was collected at a 2-week follow-up in this study, when participants were not allowed to go up and down stairs, so the items involving these activities were not assessed. Therefore, the total score

ranged from 0 to 18. The Cronbach's alpha reliability of the MBAI-Thai version tested in 703 older adults was .67, and its inter-rater reliability was .79.³⁷ The Cronbach's alpha reliability in this study participants was .80

Data Collection: To avoid invalid information due to writing and vision problems, an interview method and extraction from medical record were employed for data collection, which was given on the first day preoperatively (Demographic and Health Information Questions and Functional Ability Improvement Expectation Questionnaire), and at two-week postoperative follow-up (CTM-15 and MBAI) by well-trained orthopedic nurses (RNs).

Data Analysis: All data analyses were performed using SPSS for Windows version 18 (Software License Download @ Mahidol). Descriptive analysis was performed for all study variables. Assumptions of linearity and normality were checked before using Pearson's correlation and predictive analysis. Additionally, autocorrelation and multicollinearity were also verified for regression analysis assumptions, and Pearson's correlation was employed to examine the strength and associated direction between the study variables. Based on a theoretical framework, the hierarchy regression analysis was used to examine predictive capability of the set of variables in predicting the likelihood of functional ability at a 2-week follow-up.

Results

Participants' Characteristics

The total of initial participants was 98. Among these, three participants dropped out (one participant could not be discharged to home as per the clinical pathway, and two others were lost to follow-up and could not contact due to changes in address). The remaining participants (n=95) had a mean age of 67.2, and 93.7% were female. More than half (54.7%) had ≥ 2 comorbidities. Most participants lived with and got support from their children. The average time of illness since diagnosis of osteoarthritis was 15.25

years. Pain intensity mean score from medical records at admission was 3.10 from 10 numeric rating score. Most participants (67.4%) were independent pre-operative physical function. Overall average LOS was 4.2 days (See Table 1)

Functional Ability Improvement Expectation, Quality of Care Transition, and Functional Ability

As shown in Table 2, the participants had moderate functional ability improvement expectation and quality of care transition when the mean score was compared with the mid possible score of the measures. The Social Participation subscale was the highest expectation of improvement, while the lowest expectation of improvement was symptom reduction. Regarding quality of care transition, the critical understanding dimension showed the highest score, followed by care plan. For functional ability, participants reported high ability to perform activities of daily living (ADLs) when the mean score was compared with the mid possible score.

Predictors of Functional Ability

As shown in Table 3, patients' characteristics including age, body mass index (BMI), comorbidity, and pre-operative physical function did not show a statistical correlation to functional ability. Overall functional ability improvement expectation and quality of care transition showed a positive correlation to functional ability.

In the regression model, the structure of care variable, patients' characteristics (age, BMI, comorbidity, and pre-operative physical function), were entered into the model first, followed by functional ability improvement expectation. Then, the care process variable, quality of care transition was entered into the predictive model. To assess more specific benefits of functional ability improvement expectation and quality of care transition on improvement of care, only subscales of those two variables were investigated for their predictive powers. In the first model, although the model was insignificant, pre-operative physical function was a significant predictor of functional

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Table 1. Percentage, mean, and standard deviation of participants' characteristics (N = 95)

Variable	N (%)	Variable	N (%)
Gender		Site of surgery	
male	6 (6.3)	hip	14 (14.7)
female	89 (93.7)	knee	81 (85.3)
Age		Duration of disease	
(M ± SD = 67.2 ± 9.0)		(M ± SD = 15.25 ± .75 years)	
60-74 years	76 (80)	no	17 (17.9)
75- 84 years	16 (16.8)	1-2	26 (27.4)
85 +	3 (3.2)	≥ 2	52 (54.7)
Education		Pain (M ± SD = 3.10 ± .24)	
informal education	3 (3.2)	mild	70 (73.6)
primary school	55 (57.9)	moderate	25 (26.4)
secondary school	22 (23.1)	Fall history	
graduate +	15 (15.8)	no	54 (56.8)
Marital status		yes	41 (43.2)
single	7 (7.4)	Visual problem	
married	77 (81.1)	no	45 (47.4)
widowed/divorced	11 (11.5)	yes	50 (52.6)
Living		LOS (M ± SD = 4.2 ± 2.3)	
alone	2 (2.1)	3-5 days	83 (87.4)
with spouse	21 (22.1)	6-7 days	12 (12.6)
with children	52 (54.7)	Body mass index (kg/m²) *	
with relatives	20 (21.1)	underweight (<18.5)	2 (2.1)
Social support		normal (18.5 - 22.9)	12 (12.6)
spouse	18 (18.9)	obese level I (23 - 24.9)	20 (21.1)
children	69 (62.2)	obese level II (25 - 29.9)	42 (44.2)
other (i.e relatives)	18 (18.9)	obese level III (≥ 30)	19 (20.0)
Pre-operative physical function		Comorbidity	
independent	64 (67.4)	no	17 (17.9)
mild dependent	25 (26.3)	1-2	26 (27.4)
moderate dependent	6 (6.3)	≥ 2	52 (54.7)

Note: * Based on Asian Index value

Table 2. Mean scores and standard deviation of study variables (N = 95)

Variables	Range		M ± SD
	Possible score	Actual score	
Overall FAI expectation*	0 - 3	1.33 - 2.87	2.12 ± 0.30
walking ability subscale	0 - 3	0.75 - 3.00	2.14 ± 0.51
symptom reduction subscale	0 - 3	1.17 - 2.83	2.04 ± 0.41
social participation subscale	0 - 3	1.33 - 3.00	2.20 ± 0.48
Overall quality of care transition	0 -100	28.89 - 80.00	60.42 ± 12.50
critical understanding subscale	0 -100	27.78 - 88.89	63.21 ± 14.04
important preferences subscale	0 -100	11.11 - 100.00	59.29 ± 21.10
management preparation subscale	0 -100	8.33 - 83.33	57.98 ± 16.70
care plan subscale	0 -100	16.67 -100.00	58.59 ± 19.42
Functional ability (MBAI)**	0 -18	15.00 - 18.00	16.63 ± 0.88

Note: * Functional ability improvement expectation; **Modified Barthel Activities of Daily Index

Table 3. Correlation between independent variables and functional ability (N = 95)

Variable	1	2	3	4	5	5.1	5.2	5.3	6	6.1	6.2	6.3	6.4	7
1. Age	1.00													
2. Body mass index	-.02	1.00												
3. Comorbidity	.16	-.05	1.00											
4. Pre-operative physical function	.08	.10	.30**	1.00										
5. FAI Expectations ^a	.11	.10	-.16	-.14	1.00									
5.1 walking ability	.09	.04	-.12	-.05	.73**	1.00								
5.2 symptom reduction	.14	.17	-.17	.01	.75**	.57**	1.00							
5.3 social participation	-.01	-.02	-.05	-.28**	.56**	.12	-.03	1.00						
6. Quality of care transition	.06	-.03	-.05	.21*	.46**	.38**	.43**	.14	1.00					
6.1 critical understanding	-.14	-.13	-.13	.12	.41**	.29**	.35**	.19	.54**	1.00				
6.2 important preferences	.13	.05	-.02	.18	.32**	.24*	.31**	.07	.75**	.52**	1.00			
6.3 management preparation	.11	.02	.03	.07	.34**	.36**	.36**	.12	.71**	.42**	.35**	1.00		
6.4 care plan	.19	.01	.02	.35**	.23*	.21*	.16	.10	.55**	.35**	.32**	.22*	1.00	
7. Functional ability	-.03	-.09	-.10	.17	.24*	.42**	.34**	-.17	.39**	.36**	.16	.39**	.17	1.00

Note: ^afunctional ability improvement expectation; * significance at the .05 level; ** significance at the .01 level

ability. In the second model, after controlling patients' characteristics, only pre-operative physical function and walking ability were significant predictors and explained an additional 21.9% of variance in functional ability. For the final model, all predictors explained 36.9% of variance in functional ability,

which accounted for an extra 8.0% of the variance in functional ability. However, only walking ability, social participation, and management preparation, were significant predictors of functional ability in the final model (Table 4).

Table 4 Summary of hierarchical regression analysis of factors predicting functional ability (N = 95)

Predictors	b	S.E (b)	Beta	t	p-value
Model 1					
constant	17.373	.923		18.820	.000
age	-.003	.010	-.026	-.249	.804
body mass index	-.027	.022	-.124	-1.206	.231
comorbidity	-.404	.249	-.175	-1.620	.109
pre-operative physical function	.349	.157	.239	2.219	.029
R = .265; R ² = .070; Adjusted R ² = .029; SEE = .875; Overall F _(4,90) = 1.702, p = .157					
Model 2					
constant	16.594	.963		17.234	.000
age	-.009	.009	-.095	-1.022	.309
body mass index	-.034	.020	-.156	-1.680	.097
comorbidity	-.211	.226	-.092	-.933	.354
pre-operative physical function	.283	.146	.193	1.940	.050
walking ability ^a	.646	.195	.373	3.313	.001

Table 4 Summary of hierarchical regression analysis of factors predicting functional ability (N = 95)(Cont.)

Predictors	b	S.E (b)	Beta	t	p-value
symptom reduction ^a	.266	.223	.138	1.192	.237
social participation ^a	-.299	.174	-.164	-1.721	.089

R = .538; R² = .289; Adjusted R² = .232; SEE = .778; R² change = .219; Overall F_(7,87) = 5.054, p = .000

Model 3

constant	15.643	1.022		15.309	.000
age	-.004	.010	-.043	-.444	.658
body mass index	-.023	.020	-.103	-1.104	.273
comorbidity	-.214	.222	-.093	-.963	.339
pre-operative physical function	.230	.156	.157	1.471	.145
walking ability ^a	.549	.194	.317	2.838	.006
symptom reduction ^a	.073	.228	.038	.320	.750
social participation ^a	-.377	.177	-.207	-2.128	.036
critical understanding ^b	.014	.008	.228	1.816	.073
important preferences ^b	-.005	.005	-.126	-1.160	.249
management preparation ^b	.011	.006	.211	2.037	.045
care plan ^b	-.001	.005	-.014	-.137	.891

R = .607; R² = .369; Adjusted R² = .285; SEE = .751; R² change = .080; Overall F_(11,83) = 4.407, p = .000

Note: * significance at the .05 level; ^a functional activity improvement expectation subscale, ^b quality of care transition subscale

Discussion

Results from our study address the functional ability of Thai older adults undergoing TJA at the immediate time point, on a 2-week assessment post-discharge, and a predictive power of care structure (patients' characteristics and functional ability improvement expectation) and care process (quality of care transition) on functional ability. Results from our study revealed functional ability assessed by MBAI was high. Previous studies suggest that the significant change of treatment outcomes for TJA was observed at the first three months until six months^{27,28,38}, while some studies examined outcomes at 12 months postoperatively.^{14,29} Unfortunately, our findings could not be compared with those studies since we assessed the outcomes at a different time

point together with different outcomes. This high level of functional ability in this study may be because participants received routine preoperative health education at the out-patient department along with screening for operative risks. In the case of patients who had risks for surgery, they were referred to specialists, such as cardiologists or anesthesiologists for evaluation and treatment before getting surgery. Obviously, our results showed high level of performing ADLs, basic physical performance.

In the first model of regression analysis results, only pre-operative physical function showed significant predictability on functional ability 2-week postoperatively, while age, BMI, and comorbidity were not significant predictive powers on functional ability. This result was partly supported by previous studies, which indicated that advancing age, high BMI, and having

comorbidities were negative predictors of post-operative functional outcomes; in contrary to pre-operative physical function was a strong predictor of functional outcome.^{25, 39} The explanation of these results maybe because most of the participants in this study had predominantly independent physical function preoperatively. Additionally, they received elective surgery, which were given the comprehensive pre-operative assessment, evaluation, and management for preventing post-operative complications. These led the participants to maintain their functional ability postoperatively. However, age, BMI, and comorbidity were not significant predictor of functional ability which was differed from previous studies.^{7, 25, 39} The different findings could be explained by the average age and BMI of participants in this present study were lower than those in the previous studies. In addition, the difference in comorbidity and functional outcome measure may affect the results. For example, the comorbidity in this study was investigated by counting the number of comorbidities compared with the Charlson index and the Elixhauser comorbidity measures used in other studies.³⁹ For post-operative outcomes, functional ability in this study was evaluated by using MBAI, which indicated basic functional ability, while previous studies measured both physical and emotional function representing functional outcomes by using the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) and Short Form-36 (SF-36).^{25, 39} Another explanation may be because the participants in this study were a younger age group and half of them had more than two comorbidities (mostly metabolic syndromes), which were common diseases reported in older adults. These led the participants to maintain their pre-operative physical function more than it influenced post-operative functional ability.

After functional ability improvement expectation subscales were added in the second model, only social participation and walking ability subscales were independent predictors of functional ability at a 2 week follow-up. This was in contrast to a previous

study that patients' expectations of surgical treatment outcomes, particularly relief of pain, which one of vital symptoms of osteoarthritis, was an independent predictor of physical function in both the WOMAC and SF-36 subscales.¹⁰ This dissimilar finding may be due to the different types of measures used, the timing of assessment, and outcome aspects.²⁸ In addition, the participants in this study might have some difficulty in walking as well as social participation as their average duration of time since diagnosis was long lasting, whereas pain was reported as low level, and no other symptoms such as stiffness or warmth and swelling were reported. Therefore, these participants may be more concerned about their ability of walking and social participation, which led to a need to fulfill improvement more than symptom reduction of pain, which they perceived less at the timing of assessment. Interestingly, social participation showed a negative association and prediction with functional ability. One possible reason may be the participants only performed basic functional ability at a 2-week follow-up, which it might be some limitations in functional ability impeding the daily rituals at post-surgery. Notably, due to the nature of post-operative TJA, the PWTJA are only able to perform full functional performance at least three months post-operatively, so during the immediate time assessment of a 2-week follow-up, the participants may rely on walking aids or some help from their family members or others. In Thai traditional culture, children commonly live with or are willing to take care of their ageing parents and thus participants in this study perceived functional ability improvement expectation which was not congruent with functional ability post-operatively due to feeling dependent and needing help from their children. However, this association between functional ability improvement expectation and functional ability was relatively consistent with a systematic review which showed that patients' pre-operative expectations were inconsistently associated with treatment outcomes in PWTJA.²⁸

In the final model, quality of care transition subscales were added into the final model; only management preparation dimension was found to be significant predictor of functional ability. Not surprisingly, during admission, not only the clinical pathway was applied to all PWTJA, but also clinical pharmacists were responsible for medication reconciliation, and these factors may have resulted in successful care transitions among PWTJA who were older adults with coexisting chronic illness. Importantly, nursing's role also strengthened the quality of care transition particular to home healthcare. During admission the home healthcare nurses visited, educated, and prepared patients and family members on how to care for patients after discharge to their homes. They also visited patients at their homes on the first three days after discharge to evaluate and help the patient to cope and manage any problems that occurred. This was in agreement with a previous study that found a holistic transitional care program, comprising discharge planning and in-home visiting, led to successful care transition among older adults.⁴⁰ Moreover, this service system given to PWTJA in this study helped to provide the comprehensive care which produced overall success.^{12,38}

However, other quality of care transition subscales had insignificant predictive powers on functional ability. This may be because the information related to transition care in these subscales was consistent with routine TJA care along with clinical pathway provided to the participants. This led these subscales to have less power than the management preparation subscale to predict functional ability as previously mentioned. This may, at least in part, have lead the quality of care transition to join with functional ability improvement expectation to predict functional ability. Pre-operative physical function was an insignificant predictor of functional ability, which may be because it was suppressed by walking ability, social participation, and management preparation which showed higher predictive power. However, results from this study supported that a triad of structure, process, and outcome components

based on Donabedian's model which states that good structure should lead to good process, and in turn promote good outcomes.¹⁸

Limitations

There were some study limitations which should be acknowledged. Participants were recruited from one tertiary care university hospital, and the majority of participants were persons with TKA. This limits generalizability. Due to a small number of people with THR, analyses to compare functional ability improvement expectation and quality of care transition between TKA and THR were not possible. Regarding functional ability assessment, only a self-reported ADL was used, so it might lead to an over-estimate of outcomes. Moreover, the functional ability improvement expectation questionnaire was new, so psychometric property testing in a large sample sized is needed. In addition, a different type of surgery may influence functional ability even although the patient is encouraged to start early ambulation in performing functional ability early as possible.

Conclusions and Implications for Nursing Practice

This study examined functional ability among patients with TJA over an immediate time point, and predictive power of patients' characteristics, functional ability improvement expectation, and quality of care transition of functional ability. Functional ability improvement expectation (walking and social participation subscales) and quality of care transition (management preparation subscale) were demonstrated to be predictive of functional ability. For a successful recovery from surgery for performing ADL, nurses are key to providing holistic care and need to design preoperative education interventions. These can help patients to develop realistic expectations about treatment outcomes to fulfil their expectations, particularly

since walking ability is potentially an important contributor to functional ability in PWTJA. In addition, to help older adults with limited functional ability to maintain their social participation, engaging family-integrated care is pivotal to improving nursing care in PWJA. Moreover, nurses need to communicate and coordinate care not only with patients and their families, but also with health care teams to properly manage preparation for PWTJA during hospitalization. Importantly, in providing transitional care, that is continuing care from hospital through to the home, there is emphasis on professional nursing roles in long-term care management for PWTJA. This will elucidate the benefits to promote quality of transition care successfully and better health outcomes postoperatively.

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ปัจจัยทำนายความสามารถในการทำกิจกรรมของผู้สูงอายุที่ได้รับการผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียม

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บทคัดย่อ: การผ่าตัดเปลี่ยนข้อเทียมถือเป็นมาตรฐานการรักษาเพื่อลดอาการปวดข้อเรื้อรัง เพิ่มประสิทธิภาพการทำงานของข้อ รวมทั้งคุณภาพชีวิตของผู้สูงอายุที่มีปัญหาข้อเสื่อม ความคาดหวังในผลลัพธ์หลังผ่าตัดและคุณภาพการดูแลขณะเปลี่ยนผ่าน เป็นประเด็นสำคัญที่เกี่ยวข้องกับการฟื้นฟูสภาพของผู้ป่วยหลังผ่าตัด การศึกษาแบบไปข้างหน้าในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยทำนายความสามารถในการทำกิจกรรมของผู้สูงอายุหลังได้รับการผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียม 2 สัปดาห์ กลุ่มตัวอย่างคือผู้สูงอายุที่เข้ารับการผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียมจำนวน 95 ราย เก็บข้อมูลด้วยแบบสอบถามข้อมูลส่วนบุคคลและข้อมูลสุขภาพ แบบสอบถามความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัด แบบสอบถามคุณภาพการดูแลขณะเปลี่ยนผ่าน และแบบประเมินความสามารถในการทำกิจวัตรประจำวัน วิเคราะห์ข้อมูลด้วยสถิติบรรยาย วิเคราะห์ความสัมพันธ์ของเพียร์สัน และวิเคราะห์ถดถอยพหุคูณแบบเชิงชั้น

ผลการศึกษาพบว่า ผู้สูงอายุกลุ่มตัวอย่างมีระดับความสามารถในการทำกิจกรรมสูง ขณะมาติดตามการรักษา 2 สัปดาห์หลังได้รับการผ่าตัด ความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัด และคุณภาพการดูแลขณะเปลี่ยนผ่านมีความสัมพันธ์ทางบวกกับความสามารถในการทำกิจกรรมหลังผ่าตัด 2 สัปดาห์ ในขณะที่ปัจจัยลักษณะส่วนบุคคลของกลุ่มตัวอย่างมีความสัมพันธ์กับความสามารถในการทำกิจกรรมอย่างไม่มีนัยสำคัญทางสถิติ ความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัดด้านความสามารถในการเดินและด้านการมีส่วนร่วมทางสังคม และคุณภาพการดูแลขณะเปลี่ยนผ่านด้านการเตรียมการจัดการการดูแลเป็นตัวแปรทำนายและร่วมกันทำนายโดยอธิบายความแปรปรวนความสามารถในการทำกิจกรรมของผู้สูงอายุหลังผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียม 2 สัปดาห์หลังได้รับการผ่าตัด ร้อยละ 36.9 ผลการศึกษานี้ช่วยให้พยาบาลออกแบบกิจกรรมการพยาบาลที่เน้นการช่วยให้ผู้ป่วยมีความคาดหวังความสามารถในการทำกิจกรรมตรงกับความเป็นจริงหลังการผ่าตัดเปลี่ยนข้อเทียมโดยเฉพาะความสามารถในการเดินและการมีส่วนร่วมในสังคม และการประสานการดูแลทั้งผู้ป่วยและญาติ รวมถึงทีมสุขภาพในการจัดการการดูแลผู้ป่วยอย่างเหมาะสม อันจะนำไปสู่การพัฒนาคุณภาพการพยาบาลและผลลัพธ์ทางคลินิก

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คำสำคัญ: ความสามารถในการทำกิจกรรม, ความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัด, คุณภาพการดูแลขณะเปลี่ยนผ่าน, การผ่าตัดเปลี่ยนข้อเทียม

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