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### Patient Outcomes Following Hip and Knee Joint Replacement Surgery: Role of the Social and Physical Environment in Recovery

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Patient Outcomes Following Hip and Knee Joint Replacement Surgery: Role of the Social and  
Physical Environment in Recovery

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**Abstract**

Osteoarthritis is a degenerative joint disease that affects over 27 million Americans (Centers for Disease Control & Prevention, 2014). Joint replacement surgery is often recommended for patients who do not respond to conventional medical treatment. Post-surgical rehabilitation, especially occupational therapy (OT), promotes recovery in patients with osteoarthritis. Occupational therapy intervention is aimed at improving one's ability to function independently in various environments and complete basic tasks of everyday life, such as eating, bathing, shopping, driving, and preparing food. While such tasks may seem mundane for some, others faced with debilitating conditions struggle to complete them without assistance. For individuals with osteoarthritis, social and environmental factors, including the social environment, the physical home environment, and the physical community environment influence recovery from hip and knee joint replacement surgery. However, these factors are not always considered in OT intervention. This study examines the influence of these three factors among older adults age 50-80 years who have had a recent hip or joint knee replacement surgery. The purpose of this study is to understand the role of the social and physical environments during post-surgical rehabilitation.

## **Introduction and Literature Review**

Osteoarthritis (OA) is defined as a degenerative joint condition characterized by continuous loss of articular cartilage at a joint. Symptoms include pain, swelling, and stiffness (Centers for Disease Control and Prevention, 2014). As the disease progresses, joint cartilage may be worn down completely, leading to enhanced pain and debilitation. The most commonly affected joints in OA include the hand, foot, knee, spine, and hip joints (Smith-Gabai, 2011). When exercise, medication, and physical therapy fail, a successful intervention for this condition is to replace the affected joint with a prosthetic joint (Walker, 2012).

Joint replacement surgery is the treatment of choice for many patients with OA. A 20-year longitudinal study found that patients who underwent total knee joint replacement surgery improved on activities of daily living, or ADLs, instrumental activities of daily living, or IADLs, and disability measures post-procedure, while those who did not undergo surgery did not improve on these measures (George, Ruiz, & Sloan, 2008). In a similar study that also included hip joint replacement patients, significant improvements in ADLs and IADLs were documented at 6 weeks, 6 months, and 12 months post-surgery (Hamel, Toth, & Legedza, 2008).

Based on these results and those of similar studies, total replacement of the hip and knee joints provides pain relief and improves function in those with prior OA. Still, patients are restricted in performing certain movements for a time period after surgery to avoid dislocating the joint replacement. To aid in recovery, methods that adapt one's environment include installing shower seats, installing raised toilet seats, and using long-handled adaptive equipment, such as a reacher and shoe horn (Smith-Gabai, 2011). Other areas of concern for patients are transfers into and out of bed, on and off the toilet, and into and out of a car. The weeks and months following surgery are crucial for patients to re-adapt to their surroundings.

Aside from functional mobility and pain management, another major aspect of hip and knee joint replacement surgery involves patient expectations and perceptions. A study about waiting to undergo joint replacement surgery found that patients who were dissatisfied post-surgery were more likely to overestimate their initial waiting time and report a lower quality of life, while those who were satisfied post-surgery underestimated their initial waiting time (Conner-Spady et al., 2011). Furthermore, a study on the predictive nature of hope and self-efficacy found that having higher hope scores tended to predict higher depression scores before surgery (Hartley, Vance, Elliott, Cuckler, & Berry, 2008). Lastly, a systematic review on psychological factors impacting hip and knee joint replacement outcomes focused on outcomes less than one year after surgery and outcomes at one year and over a year after surgery. This review found that less than a year after surgery, patients with lower mental health scores pre-surgery tended to have worse functioning and pain scores; patients with a tendency towards pain catastrophizing, or exaggeration and perceived helplessness surrounding pain symptoms, tended to have higher pain scores post-surgery. In addition, at one year and over a year after surgery, patients with lower mental health scores pre-surgery still tended to have worse functioning and pain scores (Vissers et al., 2012). Hence, the literature on patient expectations and perceptions of hip and knee joint replacement surgery highlights an area that could benefit from OT. Pre-surgery education on assistive technology use, explanation of surgery expectations, and management of chronic disease, including depression, are some OT services that could promote mental health during recovery (American Occupational Therapy Association, 2016).

The role of occupational therapists (OTs) in the treatment of OA is to assist with regaining functional independence in ADLs, such as getting dressed, bathing, and brushing teeth, and IADLs, such as driving, doing laundry, and cooking. Typically, patients with hip and knee

replacements experience pain and limitations in functioning both within and outside of the home. The role of OTs for patients with joint replacement surgery is to adapt and modify the environment, so as to promote functional mobility and independence in ADLs and IADLs. Despite the benefits of OT after surgery, there is a gap in research on the role of OT following joint replacement surgery, particularly on the social, home, and community environments.

Existing research suggests that OTs should incorporate at-home social support into intervention. One study on the effects of social support on hip and knee joint replacement surgery showed that patients with higher levels of social support exhibited higher levels of well-being after surgery (Kiefer, 2011). Similar effects were reported in a small-scale phenomenological study in which post-surgery patients discussed their reliance on family members upon discharge from the hospital (Perry et al., 2011). Individuals with low levels of social support in the home may need a more involved OT intervention than those with higher levels.

A second area that is worth exploring surrounds the use of assistive technology (AT) to help with ADLs after surgery. A study about nonuse of AT following surgery found that patients felt left out in the process of deciding what equipment to bring home and use (Pinkelman & Gardine, 2010). Another study found that use of adaptive equipment promoted independence following surgery (Seeger & Fisher, 1982). As exemplified by the latter study, much of the research on AT use following joint replacement is outdated. The body of research on physical home environment and AT merits updating and growth.

Third, emerging research on the role of the physical community environment highlights the limitations in functioning experienced by patients with OA. A recent study suggests that knee joint replacement patients experience local community restrictions just as OA patients who have

not undergone surgery do (Maxwell et. al, 2013). Another study measured performance satisfaction, overall performance, and confidence levels following an OT intervention that focused on community-living tasks. Significant increases in all three measures were reported. Reintegration into the community is crucial following hip and knee replacement surgery, but is sometimes neglected in OT interventions offered at outpatient centers and skilled nursing facilities (Gillen et al., 2007). Further research on community reintegration after surgery should be conducted so that it may be considered in future OT interventions.

As the number of individuals 65 years and older rises, so will the incidence of hip and knee joint replacement surgeries and, as a result, the need for more home-based rehabilitation. By exploring the role of the social and physical environments in post-surgical hip and knee joint replacement patients, this study will add to the body of research on OT intervention post-surgery and thus provide recommendations for OT clinical practice.

### Research Questions

This study centered on three research questions:

- 1) What is the role of the social environment on recovery from hip and knee joint replacement surgery?
- 2) What is the role of the physical home environment on recovery from hip and knee joint replacement surgery?
- 3) What is the role of the physical community environment on recovery from hip and knee joint replacement surgery?

### **Method**

#### Research Design

To answer the research questions, a mixed-methods concurrent explanatory (QUAN qual) design was used. Mixed-methods research designs involve collection and analysis of both quantitative and qualitative data. Mixed methods designs utilize both quantitative and qualitative traditions data to answer research questions. In concurrent explanatory designs, qualitative data is used to explain findings from quantitative data. Triangulation is achieved by verifying findings from one tradition against findings from the second tradition. This type of triangulation design centers on quantitative data and incorporates qualitative questions to support the quantitative piece (Creswell & Clark, 2006).

For this study, two questionnaires were administered, followed by semi-structured qualitative questions. Approval was received from the Institutional Review Board at the University of New Hampshire prior to recruitment of participants. Participants gave permission to be included in the study through informed consent documents.

### Participants

Participant recruitment took place in southern New Hampshire, Maine, northern Massachusetts, Connecticut, and southeastern Pennsylvania. This aimed to eliminate a single-location bias on results. Recruitment centered on distribution and posting of recruitment flyers in senior centers across these states, as well as help from an orthopedic surgeon. The surgeon helped by recruiting his patients, who were approximately 6 months from hip and/or knee joint replacement surgery. In New Hampshire, Massachusetts, Maine, and Connecticut, participants were recruited through recommendations from friends and inquiries from flyers. The inclusion criteria for this study were that participants were able to speak and understand English, fell within the age range of 50 to 80 years old, and underwent joint replacement surgery within approximately the last 6 months. Exclusionary criteria for this study were not being able to speak



and understand English, not falling within the set age range, and being diagnosed with any form of dementia. The post-surgery time frame was crucial, as ADL and IADL functioning at home and in the local community are most impacted during the months following hip and knee joint replacement surgery. During recruitment, a demographics and background information survey was collected to determine inclusion and exclusion criteria in respondents. Once inclusion and exclusion criteria were established in participants, interview dates and locations were set.

A convenience sample of 20 adults and older adults was recruited from New Hampshire, northern Massachusetts, Maine, Connecticut, and southeastern Pennsylvania. 65% of participants were female (n=13), and 35% were male (n=7). 90% of participants were white (n=18), 5% were black (n=1), and 5% were Pacific Islander (n=1). 65% of participants were under age 65 (n=13), and 35% of participants were 65 and older (n=7).

### Data Collection

To equally address both quantitative and qualitative data, face-to-face interviews were conducted with each participant. The first part of the interview was devoted to quantitative data collection with the use of two questionnaires, respectively: the Arthritis Impact Measurement Scales 2, or AIMS2, and the Home and Community Environment Survey, or HACE Survey. The interview then concluded with semi-structured interview questions. Interviews took place at participants' homes, workplaces, and at local restaurants; interviews ranged from approximately 25 to 50 minutes in length.

### Measures

#### *Arthritis Impact Measurement Scales 2 (AIMS2)*

The AIMS2 questionnaire consists of 12 subscales, each on a 5-point scale: Mobility level, walking and bending, self-care tasks, household tasks, hand and finger function, arm

function, work, arthritis pain, social activity, support from family and friends, level of tension, and mood. These 12 subscales are categorized into a 5-Component Health Scale, which includes a Physical scale made up of mobility level, walking and bending, hand and finger function, arm function, self-care, and household tasks; an Affect scale made up of mood and level of tension; a Symptom scale made up of the arthritis pain subscale; the Social Interaction scale made up of social activity and support from family and friends, and lastly, the Role scale made up of the work subscale. Each score of the five-component scale was normalized to range from zero to 10, with zero being best health and 10 being worst. Additionally, a Satisfaction scale that ranked each of the 12 subscales was also normalized to range from zero to 10 (Meenan et al., 1990).

The AIMS2 questionnaire has good internal consistency and test-retest reliability among its 12 subscales, with Cronbach's alpha coefficients ranging from 0.74-0.96 for participants with osteoarthritis (Gignac, Cao, Mcalpine, & Badley, 2011).

#### *Home and Community Environment (HACE) Survey*

Following administration of the AIMS2 questionnaire was the HACE survey. This survey consists of three main sections, including home accessibility, AT facilitators and barriers, and community facilitators and barriers. The home accessibility section includes questions about steps to the home, steps inside the home, presence of a ramp, and overall accessibility, such as access to a car and ability to drive. Furthermore, the AT facilitators and barriers section includes 'yes' and 'no' questions about what AT one does or not have, as well as a computer and access to the Internet. Lastly, the community facilitators and barriers section includes questions about community accessibility and attitudes on disability of individuals within the community (Keysor, 2008). The HACE questionnaire has sufficient reliability (Keysor, Jette, Haley, 2005).

#### *Semi-Structured Interview Questions*

Finally, after administration of the AIMS2 and HACE questionnaires, the interview concluded with semi-structured qualitative questions. These questions centered on life after surgery and surgical impact, OT post-surgery, pain post-surgery, role of family and friends in surgery recovery, and confidence in getting around the home and community; These questions were designed to expand off of quantitative data from the AIMS2 questionnaire and HACE survey. If participants expanded upon these topics at any point during the interview, this information was considered sufficient and a similar question was not repeated.

## **Procedures**

### Data Analysis

#### Quantitative

For Research Question #1 (What is the role of the social environment on recovery from hip and knee joint replacement surgery?), Pearson correlations were conducted between the 5-Component Health Scale scores and other measures from the AIMS2, including Overall Arthritis Impact and Satisfaction sections. For Research Questions #2 (What is the role of the physical home environment on recovery from hip and knee joint replacement surgery?) and #3 (What is the role of the physical community environment on recovery from hip and knee joint replacement surgery?), Pearson correlations were conducted between each of the 5-Component Health Scale scores and the Satisfaction scale from the AIMS2, and the summed measures of the home environment, AT, and community sections from the HACE survey. Data for all research questions was analyzed using SPSS Statistics 23 software.

## Qualitative

For all research questions, qualitative data from administration of the AIMS2 and HACE and from semi-structured questions was analyzed using open coding, identification of themes, and content analysis. Six interviews were coded.

## Results

### *Quantitative*

For Research Question #1 (What is the role of the social environment in recovery from hip and knee joint replacement surgery?), a significant ( $p < 0.05$ ) moderate positive correlation ( $r = 0.606$ ) was found between the Social Interaction Component Health Scale and the Role Component Health Scale from the AIMS2. This finding exhibits that participants who were more successful in work tended to be more socially active, and those who were less successful in work tended to be less socially active.<sup>1</sup>

For Research Question #2 (What is the impact of the physical home environment on recovery from hip and knee joint replacement surgery?), a highly significant ( $p < 0.01$ ) moderate positive correlation ( $r = 0.588$ ) was found between physical functioning, based on the Physical Component Health Scale from the AIMS2, and amount of AT, based on the AT section of the HACE survey. This finding exhibits that participants with better physical function scores also tended to have less AT, and those with worse physical function scores tended to have more AT.

A highly significant ( $p < 0.01$ ) moderate positive correlation ( $r = 0.674$ ) was found between amount of overall satisfaction, based on the Satisfaction scale from the AIMS2, and amount of AT, based on the AT section of the HACE survey. This finding exhibits that

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<sup>1</sup> See Table 1.

participants who had more AT tended to have lower levels of satisfaction, and those with less AT had higher levels of satisfaction.

A significant ( $p < 0.05$ ) moderate positive correlation (0.609) was found between work role, based on the Role Component Health Scale from the AIMS2, and amount of AT, based on the AT section of the HACE survey. This finding exhibits that participants who had more AT tended to be less successful in work, and those with less AT tended to be more successful in work.<sup>2</sup>

For Research Question #3 (What is the impact of the physical community environment on recovery from hip and knee joint replacement surgery?), a significant ( $p < 0.05$ ) strong negative correlation ( $r = -0.726$ ) was found between physical community barriers, based on the local community section of the HACE survey, and work role, based on the Role Component Health Scale from the AIMS2. This finding exhibits that participants who had more perceived physical community barriers also tended to be more successful in work, and those with less perceived physical community barriers tended to be less successful in work.

A significant ( $p < 0.05$ ) moderate negative correlation ( $r = -0.644$ ) was found between physical community barriers, based on the local community section of the HACE survey, and symptom levels, based on the Symptom Component Health Scale from the AIMS2. This finding exhibits that participants who had more perceived physical community barriers had lower symptom levels, and those who had less perceived physical community barriers had higher symptom levels.

A significant ( $p < 0.05$ ) moderate negative correlation ( $r = -0.556$ ) was found between physical community barriers, based on the local community section of the HACE survey, and

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<sup>2</sup> See Table 2.

physical function, based on the Physical Component Health Scale from the AIMS2. This finding exhibits that participants who had more perceived physical community barriers had higher physical functioning levels, and those who had less perceived physical community barriers had lower physical functioning levels.<sup>3</sup>

### *Qualitative*

Qualitative transcription, coding, and analysis were conducted using 6 of the 20 interview transcripts. Coding, thematic analysis, and categorization of qualitative data that occurred naturally through questionnaire administration and semi-structured questions yielded five main themes: 1) Pain, 2) Surgery, 3) Physical Environment, 4) Positive impact on recovery, and 5) Complicating factors in recovery. A separate theme, titled ‘Miscellaneous,’ was created for categorization two codes: Question irrelevance and question difficulty.

### Pain

An emergent theme in the qualitative data, pain, consists of multiple codes divided into three categories: pain type, co-occurring symptoms, and pain impact. These categories comprise the following codes: multiple joints, arthritis pain, surgery pain, negative emotion, stiffness, swelling, aging, and work. Under the ‘pain type’ category, relevant codes include multiple joints, arthritis pain, and surgery pain. Under the ‘co-occurring symptoms’ category, relevant codes include stiffness and swelling. Lastly, under the ‘pain impact’ category, relevant codes include negative emotion and work.

### *Pain Type*

All participants experienced pain to some degree. For some participants, arthritis pain manifested itself in multiple joints:

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<sup>3</sup> See Table 3.

“My fingers, well, you can see my knuckles are large here. And here, my fingers are bent...I’ve never seen a doctor for my hands. I’ve been an electrician all my life, and worked with my hands, so I feel that that contributed (to my arthritis).”

Although surgery helped to eliminate the hip and knee arthritis pain, participants commented on the presence of a different kind of pain in the early months after surgery:

“When I was sitting here before (the surgery), it was like a toothache. Now there’s nothing (pain-wise). But when you work out, or when you’re at work doing something, you can feel- you know, it hurts. But it’s a totally different thing now, I can- you know, sit here without dying all night long or taking, you know. Having to take a painkiller every night to go to sleep.”

“I still have some pain, but it's not the same pain that I have with the arthritis, it's...(different).”

#### *Co-Occurring Symptoms*

For most participants, symptoms such as swelling and stiffness accompanied both arthritis and post-surgery pain:

“Yeah, I mean I had...a lot of arthritis pain, and...the arthritis pain is better, (but) the knee is still stiff and swollen.”

“I mean, there's some days where I'm really [bad], and then there's some days I'm not, so. I think, a lot, when it's really humid out, I can feel the stiffness in my knee.”

#### *Pain Impact*

The arthritis and surgical pain experienced by participants had a largely negative influence on their lives, which was evident in their tone when answering questions about their pain. Some sounded exasperated, others frustrated, and others were visibly in pain during the interview.

Work was also a prominent area that was impacted by pain and other symptoms, and that also impacted pain and symptoms felt by participants. In particular, participants who worked in demanding, fast-paced environments expressed difficulty in recovering from surgery:

“Yeah, I'm on my feet a lot, and...still walking, so I feel, um, probably it's a little easier to walk, but at the end of the day I'm still experiencing some swelling, so. And there's stiffness and discomfort because of that.”

### Surgery

Due to the topic of the study, participants reflected extensively on the emergent theme of surgery. Codes for the theme included: finances, defining moment, medicine use, insurance, hospital stay, rehabilitation, and complications. Two categories that emerged from this theme were participant satisfaction, with prominent categories of complication and improvement, and participants' decision to undergo surgery, with prominent categories of surgeon involvement and defining moment.

### *Satisfaction*

Participants' satisfaction with the surgery depended on many factors, with a prominent factor being surgery complications. Understandably, participants with more complications had lower levels of satisfaction with surgery. Some participants had a more extensive recovery than others; one participant even had multiple surgeries for her arthritic knees, including a knee replacement revision:

“My first set of knees was in...June of 2012. Left and (emphasis on ‘and’) right...it's my left knee, my prosthesis loosened.”

Surgery outcomes proved disappointing for another participant:



"Yeah. I mean...I'm sure if you talk to a doctor, they would tell you, you know, not all surgeries are 100 percent. And then- and you never know, and, I mean, one doctor could do 10 surgeries, and say 8 of them would be great, one of them would be not so great, and one of them might not be good at all. Same guy doing the same exact thing. But, that's just the way- way it is. I would say I would be that ninth one."

The most prominent factor in participant satisfaction with surgery was improvement in pain and functioning over time:

"Yeah, I had (arthritis) in both knees. But, from the surgery on this one [gestures to surgical knee], this knee is fine because I'm not... favoring the one, and pushing the other one, so I, knock on wood, it's been really good."

#### *Decision to undergo surgery*

Many participants discussed their orthopedic surgeon's involvement in their decision to undergo hip or knee joint replacement surgery:

"We took X-rays; [Surgeon] says, 'You have bone on bone and arthritis,' he says. You know, and...at this time, I was only 55, you know- and he goes, 'You're gonna need your knees replaced,' he says. 'But, let's try to hold off,' he says. 'Cause they only last, like, maybe 10 years...

he says, 'When you're ready, you tell me,' and I did."

In addition, based on the surgeon's recommendation, participants then reflected on the defining moment that made them decide to undergo surgery:

"I said, 'you'll know.' There's none of this, 'yeah, I think,' it's like, 'You got to go!'"

"I'd say year and a half, I tried cortisone shots. Didn't work. And I was bone on bone, so it got to the point..."

“We scheduled [the surgery]. Best decision I ever made. Absolutely, I could not have gone on. It was bad.”

### Physical Environment

Another theme, the physical environment, emerged when participants discussed topics related to the following codes: AT use and nonuse, home accessibility and household tasks, and community navigation and accessibility. This theme connects to Research Questions #2 and #3 about the role of the physical home and community environments, respectively.

#### *AT use and nonuse*

Participants discussed AT that they had owned, used, and enjoyed in their homes:

“I did have a raised (toilet seat), I miss it, though. Oh, my God, it was great, 'cause everywhere you go, these toilets are diff- I don't know if you ever noticed, the toilets are getting lower and lower.”

Participants also discussed AT that they had stopped using:

“Do I (have a walker)? Yeah. Did I? Yes (laughs) It's...out on the porch.”

#### *Home accessibility*

Along with AT use and nonuse, participants discussed other aspects of their home environment, including areas that they had trouble navigating. In particular, the stairs posed issues for some participants:

“You know, I do one step at a time, and once in a while I'll do two, just to- try and get it, because it's just when you hit that certain point, you can feel it, like. It'll really tense up.”

“The only place I use the cane's on the steps.”

*Community navigation and accessibility*

Furthermore, participants discussed the adjustment to navigating the community after surgery. One participant felt older because of the accommodations she needed:

“Yesterday was the first time I was able to go into the [grocery store] over here and use a stroller, 'cause I was using those carts. I feel funny because I'm so young.”

Other participants enjoyed the accessibility provided by use of a handicap sticker:

“I did (have a sticker)! I got it myself ‘cause (of limited mobility)... I wanted to park close.”

“If I go to a concert or go to, like, a baseball game, I use it.”

Positive Impact on Recovery

Another emergent theme involved factors that had a positive impact on recovery from surgery. Codes for this theme included humor, resilience, optimism, hope, future, meaningful occupation, relaxation, work, in-home therapy, OT, PT, nursing, compliance, and independence. Among the most prominent codes for this theme were family/friend support and social activity, which connects this theme to Research Question #1 about the role of the social environment in recovery.

*Family/friend support*

All participants expressed appreciation for assistance from their family, friends, and neighbors with completing ADLs and IADLs:

“My sister lives right up the street from me, she's been coming down, she's cooked for me the first week...she's been doing my laundry. So she's been- she'll come down everyday, she... makes me dinner sometimes. Her and I went shopping yesterday.”

“Yeah. I even have one girl who, her daughter brings up my trashcan, [unclear] after he'd pick it up. Soon as I go to open the door, she's bringing it up (laughs).”

*Social Activity*

Participants also spoke positively about getting together with friends and family:

“This time of year is Sundays here (at his home), unless it’s a birthday party. And then we had the- we had the Monday night game, so we went to- my wife’s brother, ‘cause they’re (football team fans), so. So, so we went over there.”

Complicating Factors in Recovery

The final theme, complicating factors in recovery, involved factors in participants’ lives that made recovery more difficult. Codes for this theme included comorbidities, uncertainty, stress, health, sleep issues, fatigue, trauma, time, asking for help, family and family history, and social issues. Out of these codes, the most prominent were comorbidities and stress, which were often co-occurring in participants’ experiences.

*Comorbidities*

Many participants had comorbidities that created added stress to the recovery process:

"And answering (these questions), it's hard for me because I'm trying to reflect the arthritis, but also the Parkinson's has a lot to do with these questions, and that's not what you're asking about, so...."

*Stress*

Along with stress from comorbidities, other participants reflected on the stresses of everyday life:

“All your life... you're raising a family, and...you got a mortgage, and you got car payments, and you're trying to pay and, put two kids in school. And, you know, all those things, you know, you- you got to keep working, you got to keep working, you got to keep working, and

then all of a sudden it just stops! And it's like [slaps hands together] hitting a wall, but then once you get up from hitting the wall, you say, 'Wow, this is easy now!'"

### **Implications for OT**

An emerging niche for OT practice is that of Health and Wellness Health (American Occupational Therapy Association, 2016). This niche involves chronic disease management and prevention, both of which are relevant to this study. First, many of this study's participants suffered from comorbidities alongside major recovery from surgery. The role of OT after hip and knee joint replacement surgery could be expanded to include chronic disease management, which involves reducing complications from such co-occurring conditions as diabetes, high blood pressure, and heart disease. Principles for chronic disease management and OT include emphasis on clients' current capabilities, adaptation of occupations to be less tiring and more enjoyable, and use of positive psychology. In this way, OT could reduce healthcare costs by reducing the rate of hospitalization related to chronic disease complications (American Occupational Therapy Association, 2016).

In addition, many participants in this study discussed the role of PT in their recovery, but only saw an OT once, if at all. While PT is an essential aspect of hip and knee joint replacement surgery recovery, OT has an essential role in providing clients with AT and educating them on how to use it. Guided by the principles of OT's role in prevention, OTs would ideally offer pre-surgical education and training on AT use to promote future use and prevent accidents, such as falls, through environmental adaptation and modified functional mobility. For instance, clients who have undergone hip joint replacement surgery are often placed on hip precautions. Pre-surgical education and training on use of AT, also known as the "hip kit," could help clients better adhere to their hip precautions.

Hence, based on findings from this study, the emerging role of OT in chronic disease management and prevention could promote better functional outcomes following hip and knee joint replacement surgery.

### **Limitations**

This study has certain limitations. First, use of a small convenience sample makes it difficult to generalize results to a larger population. Second, participant recruitment was limited to the Northeastern United States. Expansion of recruitment to other areas in the U.S. would have allowed for broader diversity in the sample. Furthermore, use of Pearson's correlations in quantitative data analysis does not equate to causation. Lastly, the AIMS2 questionnaire required a significant amount of time to administer (minimum of 20 minutes), and some of its questions confused participants. For future research, use of a more straightforward questionnaire, such as the Western Ontario and McMaster Universities Osteoarthritis Index, or WOMAC, would be advised to prevent participant fatigue and confusion.

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Table 1

*Research Question #1: Role of the social environment in recovery*

Test		Social Interaction	Physical	Affect	Symptom	Role	Satisfaction
Pearson r	Social Interaction	1	0.378	0.01	0.307	0.606	0.259
2-tailed sig.		.	0.101	0.965	0.188	0.013*	2.69
N			20	20	20	16	20

*Note.* \* =  $p < 0.05$ , two-tailed.

Table 2

*Research Question #2: Role of the physical home environment in recovery*

Test		Home barriers	AT	Physical	Affect	Sympt.	Role	Social	Satis.
Pearson r	Home barriers	1	-0.221	-0.463	-0.345	0.116	-0.277	0.037	-0.108
2-tailed sig.		.	0.364	0.046*	0.148	0.636	0.318	0.881	0.66
N		19	19	19	19	19	15	19	19
Test		Home barriers	AT	Physical	Affect	Sympt.	Role	Social	Satis.
Pearson r	AT	-0.221	1	0.588	0.138	0.352	0.609	0.39	0.674
2-tailed sig.		0.364	.	0.006**	0.562	0.128	0.012	0.089	0.001***
N		19	20	20	20	20	16	20	20

*Note:* \*= p<0.05, two-tailed, \*\*= p<0.01, two-tailed, \*\*\*= p<0.001, two-tailed. Sympt. = symptom; Satis.= satisfaction.

Table 3

*Research Question #3: Role of the physical community environment in recovery*

Test	Community barriers	Physical	Affect	Symptom	Social	Role	Satisfaction
Pearson r	1	-0.556	-0.442	-0.644	0.203	-0.726	-0.179
2-tailed sig.	.	0.039*	0.113	0.013*	0.486	0.011*	0.541
N	14	14	14	14	14	11	14

*Note: \*= $p < 0.05$ , two-tailed.*