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The Impact of Total Hip Replacement

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THE IMPACT OF TOTAL HIP REPLACEMENT
ON
QUALITY OF LIFE
A REPLICATION STUDY

By

Teri L. Holwerda

A THESIS

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ABSTRACT

THE IMPACT OF TOTAL HIP REPLACEMENT ON QUALITY OF LIFE

A REPLICATION

By

Teri L. Holwerda

This descriptive, correlational study replicated an investigation by Selman (1989) exploring the effects of Total Hip Replacement (THR) on quality of life to identify adaptation level in the four effector modes of Roy's Adaptation Model: physiologic function, self-concept, role function and interdependence. The convenience sample consisted of 43 subjects with a mean age of 67 electing to undergo primary THR at one 410-bed midwestern medical center July, 1994 through December, 1994. Subjects were tested prior to undergoing THR and four months postoperatively. The instrument used was the Arthritis Impact Measurement Scales (AIMS) an arthritis-specific, self-administered questionnaire.

Analysis of data revealed a significant improvement postoperatively in the self-concept, physiologic function and role function subscales, which was consistent with the original study. There was also significant postoperative improvement in pain and arthritis activity scores. Married subjects reported significantly greater improvement on the arthritis visual analog scale than subjects without spouses.

Dedication

This manuscript is dedicated to B.J., Andrea and Olivia, whose unwavering support and encouragement have made the completion of this work possible.

Thank you for always believing that I could do it!

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CHAPTER 1

INTRODUCTION

Arthritis, in varying forms and severity, affects more than 37 million Americans. Arthritis also accounts for 8.6 billion dollars annually in lost wages and medical expenses. This medical diagnosis accounts for 500 million days of restricted activity and 27 million days lost from work per year. Second only to heart disease, arthritis is the leading reason for individuals receiving disability payments (Altman, 1990; National Association of Orthopaedic Nurses, 1990).

Nearly 16 million Americans suffer from one form of arthritis, osteoarthritis, also known as degenerative arthritis. This disease is characterized by a progressive loss of articular cartilage and reactive changes in subchondral bone. The prevalence of osteoarthritis increases with age. It has been estimated that the disease is almost universal in persons over the age of 65 (Schumacher, 1988).

The other form of arthritis, rheumatoid arthritis, is a chronic, systemic, inflammatory disorder that affects more than 2 million Americans. Rheumatoid arthritis is characterized by progressive proliferation of the synovial membrane, laxity of ligaments and tendons, and eventual erosion of subchondral bone. Women are affected by rheumatoid arthritis two to three times more frequently than men. Although rheumatoid arthritis typically affects the joints of the hand,

wrist, knee, and foot, any synovial joint may be involved (Schumacher, 1988).

Both disease processes can be manifested by pain with movement and at rest. Enlargement and swelling of the joints and limitation of motion and function are also seen. Hip manifestation is characterized by groin, thigh, buttock and knee pain, loss of hip motion, and abnormal gait (Schumacher, 1988). The presence of pain has been found to affect patients' assessments of general health and overall arthritis status (Kazis, Meenan, & Anderson, 1983).

The physical effects of arthritis may be obvious. The psychosocial effects may not be so obvious. There is evidence that patients with arthritis may have lower self-esteem, lower work satisfaction and more of a sense of meaninglessness than persons in the general population (Earle et al., 1979). Persons with arthritis experience more depression than people in the general population, even when the variables of pain and physical limitation are controlled (Blalock, De Vellis, Brown, & Wallston, 1989).

There are many forms of medical and surgical treatment for both forms of arthritis. These range from conservative measures such as rest, weight loss, and exercise to more invasive methods such as medications and surgical interventions. Over the past two decades, surgical interventions have been refined and perfected such that total joint replacement procedures presently used offer dramatic relief of pain and restoration of function for joints severely affected by arthritis.

Performed over 150,000 times annually in the United States, Total Hip Replacement (THR) is the substitution of an artificial ball (femoral head) and socket (acetabulum) for a diseased hip joint in order to

relieve the pain and dysfunction associated with arthritis (Kozinn & Wilson, 1987). In 1992, 163 THRs were performed at the proposed study site, a midwestern medical center. The hospital charges were approximately \$14,500.00 for each THR performed. The medical center's average length of stay for this procedure was 7.2 days.

More research is conducted on the surgical techniques, implant materials, and functional outcomes for THR than on the impact surgery has on the recipient's quality of life. A Medline search revealed 86 articles entered between June and December 1992 which focused primarily on physiologic responses to the surgery, strategies to minimize complications, and investigations of materials and techniques in THR. More research articles focusing on patient reports of quality of life after THR have begun to appear in the literature in the past two years, however. Despite the frequency with which THR is performed, only a few studies explore, quantify or substantiate that it improves overall quality of life. Nursing's holistic focus places the profession in the unique position of bridging the gap between medical and surgical technology. More research must be performed to identify nursing's role in improving the quality of life beyond surgical interventions by physicians.

Quality of life in chronic disease is an important nursing concern. Exploration of the factors influencing patients' estimations of quality of life may contribute to the development of a cognitive framework explaining the impact of a chronic illness on quality of life (Burckhardt, 1985) and what role nursing has in the recovery and rehabilitation after THR.

In a population that is rapidly aging, chronic diseases such as arthritis represent challenges to nursing. The challenges are to

explore the factors affecting quality of life, to measure quality of life, and to develop interventions to improve quality of life. Nurses are in the unique position of being able to manipulate incoming stimuli for clients in order to widen their sphere of ability to cope with the stresses of their health condition. Helping those affected by arthritis to improve their quality of life is consistent with nursing's central concern of treating the client's response to their medical condition.

The results obtained in this study may have implications for nursing education, administration, and/or practice. Possible implications for education are: teaching programs for THR clients with content aimed at increasing functioning in all areas; inservice/orientation programs for orthopaedic nursing staff on specific teaching points for THR clients; sharing these findings with other health professionals involved in the care of THR clients to collaborate in developing approaches to improve quality of life; and evaluation of outcomes for clients undergoing THR to verify that quality of life has indeed been improved. Possible implications for nursing administration are: assessment tools that screen for indicators of potential maladaptation; protocols and critical paths that include standard teaching and assessment points to identify those THR clients at risk for maladaptation; and monitoring methods to verify and quantify the degree to which quality of life is improved as a result of these interventions. The implications for nursing practice are: to participate in the development of the tools and instruments outlined above; to incorporate those approaches into nursing practice; and to participate in the monitoring and evaluation of these approaches.

CHAPTER 2

REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

Review of the Literature

A literature search of nursing, allied health, and medical journals was performed to explore the research on quality of life in arthritis, quality of life outcomes for clients having undergone THR, and the utility of Roy's Adaptation Model, the organizing framework for this study. The review of the literature is arranged to examine the various definitions authors have given for quality of life, explore the quality of life in arthritis compared to the quality of life in other chronic diseases, present factors that influence the quality of life for people with arthritis, determine how pain affects quality of life for individuals with arthritis, and show how total joint arthroplasty affects the quality of life for patients electing to undergo it.

Quality of life as defined in the literature

Quality of life is not well defined in the literature. Many articles gave no definition for quality of life. Quality of life was a phrase used synonymously with "adjustment", "health status", "satisfaction" and "function" in many studies (Goeppinger, Thomas Doyle, Charlton & Lorig, 1988; Pearlman & Uhlmann, 1988; Laborde & Powers, 1980; Wiklund & Romanus, 1991). Other studies acknowledged the subjective nature of quality of life, and the need to ascertain an individual's perception of his or her quality of life (Pearlmann & Uhlmann, 1988; Bradbury & Catanzaro, 1989; O'Boyle, McGee, Hickey,

O'Malley, & Joyce, 1992; Wiklund & Romanus, 1991). There also was a recognition that quality of life was more than health, and comprised material possessions, role fulfillment, and psychosocial factors (Earle, et al., 1979; Laborde & Powers, 1980; Ware, 1987; Laupacis et al., 1993). No one common definition emerged.

Quality of life in arthritis and other chronic diseases

Arthritis has a profound impact on the health status of those afflicted by it. Laborde and Powers (1980) compared satisfaction with life for individuals with osteoarthritis and individuals requiring hemodialysis. Their findings suggested that hemodialysis patients viewed themselves as significantly more healthy than patients with osteoarthritis. In 1985, Laborde and Powers explored changes over time in levels of life satisfaction for patients with osteoarthritis and found that although most respondents viewed their past and present life satisfaction favorably, their projections for future life satisfaction declined significantly. When the health status of patients with rheumatoid arthritis was compared to the health status of patients with hypertension, cancer, diabetes mellitus, cardiac disease, and pulmonary disease, those with rheumatoid arthritis were ranked last in the eleven dimensions being studied. In fact, patients with rheumatoid arthritis registered the lowest scores on five of the eleven dimensions (Mason, Weener, Gertman, & Meenan, 1983). When arthritis was compared with hypertension, diabetes mellitus, myocardial infarction (within the previous twelve months), chronic lung problems, back problems, chronic gastro-intestinal problems and angina on scales designed to measure function and well-being, arthritis was one of four conditions that affected all health measures of function and well-being and had the greatest impact on patients' reports of pain (Stewart et al., 1989).

Pearlman and Uhlman (1988) studied elderly patients with five different chronic diseases (arthritis, ischemic heart disease, chronic pulmonary disease, diabetes mellitus and cancer) to determine what comprised quality of life and whether the perception of quality of life was different across the five diseases. Their findings indicated that differences in elderly patients' ratings of quality of life were not statistically different. In their exploration of the relationship between functional ability and satisfaction, Pincus, Summey, Soraci, Wallston, and Hummon (1983) found that over all 8 of the activities of daily living (ADL) being studied, difficulty in performing ADLs was correlated with dissatisfaction. The authors urged caution in interpreting their results because 40% of the subjects who reported "some difficulty" and 20% of the subjects who reported "much difficulty" with ADLs also reported satisfaction. Benner (1985) in her explication of the essence of quality of life exhorted nurses to "uncover" the meaning in the lived experiences of patients.

Factors that influence quality of life for individuals with arthritis

Burckhardt (1985) studied the relative impact of multiple factors on the quality of life of arthritis patients. Five "environmental" factors (age, sex, severity of impairment, socioeconomic status, and social network configuration) and four psychological mediators (perceived support, negative attitude toward the illness, self-esteem and internal control over health) were identified as variables in the study. Items were assembled from many instruments into a semi-structured questionnaire and administered to 94 patients with arthritis. Using path analysis and step-wise multiple regression, the environmental factor of severity of impairment was shown to account for 25% of the

variance in quality of life and the psychological factors of self-esteem and internal control over health contributed 25% and 20%, respectively.

Because males had been typically under-represented in studies of patients with arthritis, Bradbury and Catanzaro (1989) measured the quality of life of males with arthritis. The severity of physical impairment was found to be negatively correlated with quality of life. Moreover, the presence of social support did not enhance males' estimation of quality of life.

The effects of pain on quality of life for individuals with arthritis

Pain is a significant concern for many who suffer from arthritis, and can influence individuals' estimations of quality of life. Kazis, Meenan and Anderson (1983) found that the presence of pain was correlated with individuals' assessments of general health and overall arthritis status. Blalock, De Vellis, Brown and Wallston (1989) performed a secondary data analysis of three studies which used the Center for Epidemiological Studies Depression Scale (CES-D) on patients with rheumatoid arthritis. Their intent was to identify items on the CES-D most prone to bias from physical aspects of the disease process in rheumatoid arthritis. Their a priori criterion for "arthritis bias" was if the item shared $\geq 5\%$ of its variance with any depression-corrected health status measure. Finding that 4 items reflecting pain and lower extremity function met their bias criteria, they eliminated these items from calculation of scores. In spite of this, they found that individuals with arthritis experienced more depression than people in the general population.

The impact of THR on quality of life

Most of the earlier studies reviewed focused on prosthetic materials, infection rates and prevention, surgical techniques and

functional outcomes of THR as rated by health professionals. More recently however, there has emerged a trend toward measuring patient perceptions of quality of life after THR. Earlier studies were performed with instruments newly developed to measure quality of life. Much of the earliest data on quality of life after THR was collected while testing and comparing these new instruments. These instruments, such as the Arthritis Impact Measurements Scales and the Health Assessment Questionnaire are now nearly 15 years old and have been refined over the years.

Liang, Larson, Cullen and Schwartz (1985) compared the relative efficiency and sensitivity of five health status instruments in showing improvement over time in patients undergoing total hip and knee replacements. While they were comparing the utility of these five instruments, they also collected data on overall improvement in the areas of mobility, pain, social function and global dysfunction. The study consisted of 50 patients (25 knee replacements and 25 THRs). Health status two weeks pre-operatively was compared with health status three months post-operatively. The five health status instruments were administered to patients successively in random order. The time needed for completion of these five health status measures was 58-100 minutes, which may have resulted in test fatigue. Additionally, three months may have been too soon post-operatively for patients to have experienced all the benefits of THR for pain relief and mobility. Nonetheless, overall improvement in health status as reflected in all five instruments was demonstrated.

Roush (1985) conducted a retrospective study (n=43) to determine the effects of total knee and hip replacements on patients' ability to perform activities of daily living and to determine whether the

variables of age, sex, and surgery type could be used to predict success in these functional outcomes. All patients in the study had been diagnosed with degenerative arthritis. An instrument was developed to elicit information on occupation, education, pain experience and activities of daily living. Content validity for the instrument was established by a panel of judges. Reliability determination was not reported. Patients were surveyed 6-35 months postoperatively. When overall function was considered, 65% of the respondents indicated there had been no change, 5% indicated a negative change and 30% indicated there had been a positive change since surgery. Sex was the only statistically significant demographic variable found to influence functional outcome with women achieving higher functional scores than men ($t = 4.3, p < .05$). The author theorized that the mean age of the study sample (62) and the likely existence of co-morbidities could have contributed to the relative lack of positive functional outcomes in the study. The author also postulated that body weight differences between men and women and the resultant prosthesis stresses accounted in part for the difference in functional outcomes between men and women. In conclusion, the author stated that "functional gains...may be closely related to psychosocial factors" (p.1499) and recommended further exploration of those factors in order to increase functional outcomes after total joint replacement.

Selman (1989) measured quality of life in a THR population ($n = 46$) in a retrospective study by sending questionnaires to a convenience sample of patients who were twelve to 24 months post-THR. The instrument used to measure quality of life was the Arthritis Impact Measurement Scales (AIMS), a nine sub-scale tool whose reliability and validity had been extensively studied and reported. In order to reflect

a retrospective focus, the items on the original AIMS tool were reworded. Content validity was assessed by a panel of clinical nurses. Reliability studies were not performed. Selman based the conceptual approach to the study on Roy's Adaptation Model and measured change in the four effector modes (dependent variables) by dividing the modified AIMS into groups of items felt to reflect physiologic function, self-concept, role function and interdependence. Evidence in support of increased quality of life as a result of THR was presented. Ninety-four percent surveyed reported a positive change in physiologic function, 76% reported a positive change in self concept, 83% reported a positive change in role function, but only 46% reported a positive change in interdependence (54% indicated either no change or negative change in this mode). Selman speculated that a weakness of the modified AIMS tool may have contributed to the unexpected findings in the interdependence mode. Most of the items in this group explored family/friend gatherings, but did not explore close and intimate relationships the respondents had with these groups. Correlations between the variables were also determined using Pearson correlation coefficients. Physiologic function correlated strongest with the other three variables ($p < .001$); with self-concept $r = .74$, $p < .001$.; with role function $r = .63$, $p < .001$; with interdependence $r = .61$, $p < .001$. The strongest correlation was between the variables physiologic function and self-concept ($r = .74$, $p < .001$). The weakest correlation was between the variables self-concept and role function ($r = .46$, $p < .001$). Of the demographic variables studied, sex, age and marital status impacted the four variables. Older respondents reported less impact on interdependent relationships than younger respondents (no statistics were reported for this finding), females reported a greater improvement

in role function than males ($t = 2.03$, $p = .049$), and those without mates reported more positive change in self-concept than those with mates ($t = -2.96$, $p < .005$). Selman cited a study by Potts and Brandt (1987) which suggested that the AIMS may be biased toward traditional female roles. Selman also speculated that individuals without mates based their self-concept heavily on the ability to do for themselves, thus the greater improvement in self-concept. In closing, it was recommended that a longitudinal study be undertaken to strengthen the generalizability of the findings of the current study.

A similar study ($n = 22$) conducted by Kelley (1991) evaluated patients' perceptions of pain and disability immediately prior to a THR or Total Knee Replacement and at six weeks and six months after the surgery. Anxiety and depression levels were also evaluated at the same checkpoints. The instruments used were the Health Assessment Questionnaire (HAQ) developed at Stanford University, the AIMS, and the McGill Pain Questionnaire. Though no significant improvement in patient-perceived functional ability was detected at six weeks on the Health Assessment Questionnaire, a statistically significant improvement was noted at six months (Wilcoxon score = 21, $p < .005$). A decrease in pain perception was detected at six weeks and sustained at the six month measurement on the HAQ (Wilcoxon score = 3.5, $p < .002$; Wilcoxon score = 0, $p < .005$, respectively). A decrease in pain was also evidenced in the six month scores on the McGill Pain Questionnaire (Wilcoxon score = 9, $p < .005$). At six weeks, only the Pain subscale of the AIMS indicated a significant change, a decrease from preoperative levels (Wilcoxon score = 0, $p < .001$). However, the subscales of Mobility (Wilcoxon score = 11, $p = .042$), Physical Activity (Wilcoxon score = 5.5, $p < .005$), and Household Activity (Wilcoxon score = 3,

$p = .006$) all showed significant improvement at six months. A significant decrease in both depression (Wilcoxon score = 22, $p < .009$) and anxiety (Wilcoxon score = 36, $p < .005$) was detected with the AIMS at the six month follow-up. There was no significant improvement detected in the AIMS subscales of Dexterity, Social Activity, Activities of Daily Living, and Health Perception. The author stated that the probable reason for the lack of positive change in those subscales was the fact that all participants were diagnosed with osteoarthritis and had only one joint that was a significant problem at the time. These findings may be vastly different from a group with rheumatoid arthritis and multiple joint involvement. Recommendations for future study included using a larger sample size, using a sample which included rheumatoid arthritis patients, and narrowing the study sample to only Total Knee Replacements to determine the relationship between pain at rest and with movement.

Wiklund and Romanus (1991) compared quality of life before and one year after THR in a sample ($n = 56$) in Sweden. The instrument used was the Nottingham Health Profile, a 45-item instrument designed to measure the subjective emotional, functional and social impact of chronic disease. Functional impairment of the hip joint was evaluated by the orthopaedic surgeon preoperatively using the Charnley-Merle d'Aubigne scoring system. Paired t-tests were used to evaluate change from pre-op scores on the Nottingham Health Profile. The post-op scores on the Nottingham Health Profile were also compared to scores obtained from a healthy reference group. The authors reported improvement postoperatively in all domains measured by the instrument. Level of significance was reported for each dimension: pain ($p < 0.0001$); energy ($p < 0.0001$); sleep ($p < 0.0001$); mobility ($p < 0.0001$);

emotions ($p < 0.001$); social isolation ($p < 0.001$); housework ($p < 0.001$); holidays ($p < 0.0001$); hobbies ($p < 0.001$); social life ($p < 0.001$); family life ($p = 0.0005$); and sexual function ($p = 0.001$). The post-op scores were similar to the scores obtained from the healthy reference group in the areas of family life, social life and sexual function. However, the post-THR patients had more limitation in holidays, hobbies and housework. Statistical values were not given for these findings. The only demographic variable found to correlate with outcome was marital status. Single patients reported decreased quality of life in the areas of social isolation ($p = 0.006$) and emotions ($p = 0.03$). Degree of functional impairment preoperatively did not correlate with postoperative scores.

Similar findings were reported by O'Boyle, McGee, Hickey, O'Malley and Joyce (1992) in their study measuring quality of life after THR. Their purpose was to determine the sensitivity of the Schedule for the Evaluation of Individual Quality of Life (SEIQoL), an instrument designed to allow participants to identify the indicators for quality of life for themselves. Subjects ($n = 20$) with osteoarthritis undergoing unilateral THR were matched with controls and surveyed six weeks prior to and twenty-six weeks after THR. Other instruments used for reference were the AIMS, the Harris Hip Score, and the McMaster Health Index. Paired t-tests were used to measure change from the pre-operative state. Mean scores from the Harris Hip Score, the AIMS, and the SEIQoL improved postoperatively (significance levels $p < 0.001$, $p < 0.001$, and $p < 0.02$, respectively). Scores for the health status and physical function subscales of the McMaster Health Index improved ($p < 0.001$), but scores for the emotional and social subscales did not.

Laupacis et al. (1993) compared postoperative quality of life for two groups of patients undergoing THR with one type of prosthesis, one group with cemented technique, the other with uncemented technique. Outcome measurements for the planned ten years of study were radiographic loosening, revision rate and quality of life. At the two year mark, the sample size was 90, and both groups of patients were combined to measure quality of life. Multiple instruments were used. All measures indicated improvement ($p < 0.01$), most of which had occurred by the third postoperative month, although some measures of physical function continued to improve throughout the first year. Rorabeck et al. (1994), in a continuation of the Laupacis study, compared cemented versus cementless technique with a total of 164 patients at two years. The same multiple instruments were used to measure quality of life. All measures indicated an improvement in quality of life postoperatively, with no significant difference between the two groups. Additionally, they reported no significant difference between the two groups in hospital charges, surgeon fees or implant costs.

Conceptual Framework

The value in organizing nursing interventions according to a conceptual framework has been supported in the literature. Hoch (1987) was able to demonstrate that the systematic use of a nursing framework to construct an approach for nursing interventions directed at decreasing depression and increasing life satisfaction among the elderly was more effective than intervention not supported by a theoretical framework. Braden (1990), in testing her Self-Help Model, found that patients with arthritis who sought information from health care providers had less dependency, less uncertainty, and increased enabling

skill. In turn, self-help performance was positively impacted by level of enabling skill and attendance at a self-help class. As self-help behavior increased, so did life quality. Based on her findings, she asserted that nurses could increase the quality of life for patients with arthritis by developing interventions targeted at promotion of enabling skills.

The conceptual framework organizing the approach to measuring the impact of THR on quality of life in this study is Roy's Adaptation Model (Roy, 1984; Roy, 1991). Adaptation is a process inherent in the treatment, recovery and rehabilitation of orthopaedic patients. This framework views individuals as being comprised of systems working together to function as a whole. Roy's most recent text (1991) places a greater emphasis on the holism of individuals than is reflected in her earlier work. A developmental dimension is reflected in the way individuals continually expand their capability to adapt to environmental stressors.

The person as an adaptive system has two internal processes that act to maintain goals. These processes are the regulator subsystem and the cognator subsystem. The regulator subsystem involves physiologic processes and the cognator subsystem involves psychologic and emotional processes. Both subsystems assist the individual in adapting to the changing internal and external environments.

Regulator and cognator activity are manifested through four effector modes: physiologic function; self-concept; role mastery; and interdependence. Responses can be either adaptive or ineffective, a distinction the nurse makes with input from the individual. There is greater emphasis on involvement of the client in decisions regarding their state of adaptation in Roy's most recent work (1991). Health is a

"state and process of being and becoming an integrated and whole person" (Roy, 1991 p. 4).

The goal of nursing is to promote adaptation in each of the four adaptive (effector) modes, thereby supporting the survival, growth, reproduction and mastery of the individual. Nursing activities begin with first-level assessment, which involves assessment of behavior in each of the effector modes. Areas of concern are selected from this assessment and explored further to determine the focal, contextual, and residual stimuli contributing to each behavior, an activity Roy terms second-level assessment. These three stimulus types are considered to be the factors contributing to the behavior in need of change or reinforcement.

Although individuals tend to be separated into parts in Roy's Adaptation Model, she contends that exploration of the regulator and cognator functions will lead to a more holistic approach to treating patients. Both clinical nursing science (diagnosis and treatment of the patterning of life processes) and basic nursing science (theory and research) are focused on enhancing the person's patterns of functioning. Life processes are: regulating, thinking, becoming, valuing, relating, feeling and acting. These life processes are reflected in the person's functional life patterns. It is from these patterns that the person responds to health problems. Roy coins the term "veritativity" to encompass the totality of the human search for meaning, a universal journey toward a common "absolute truth" that is "oneness with the creator, God" (Roy, 1988). Eight underlying assumptions of the Adaptation Model are made explicit, and among them are: individuals possess intrinsic holism; and humankind has a unity of purpose ("a final union with God, the creator") (Roy, 1988).

Studies testing Roy's Adaptation Model

A number of studies have tested the utility of Roy's Adaptation Model for practice. Smith (1988) assessed the needs of a sample living in a housing complex for the elderly and found multiple group problems related to functioning in the four effector modes. The intervention was aimed at altering the contextual stimuli identified as contributing to the problems and consisted of progressively longer group walks with focused group discussion afterward. The program was successful in that outcomes for functioning in the four effector modes were met.

Roy's Adaptation Model and Neuman's Health Care Systems model were used as frameworks for designing interventions to decrease depression in a group of elderly individuals (Hoch, 1987). Individuals were randomly assigned to three groups. One group received nursing care based on Roy (n = 16), one group received nursing care based on Neuman (n = 16) and one group received nursing care not supported by a theoretical framework (n = 16). The groups receiving interventions based on Roy and Neuman demonstrated an equal improvement in depression scores from pre-intervention scores. Evidence supporting the influence of environmental stimuli on adaptation and the existence of relationships between the four effector modes has also been presented (Fawcett & Tulman, 1990).

Barnfather, Price Swain and Erickson (1989) evaluated two assessment techniques for adaptation to stress, one grounded in Roy's Adaptation Model and the other in the Adaptive Potential Assessment Model (APAM) based on the work of Erickson. They concluded that although the Roy model provided more structure for the assessment process, the APAM expanded nursing knowledge to a greater degree in that it addresses the adaptive potential of the person.

Summary of the Review of the Literature

Some studies have suggested that individuals with arthritis view their health status more negatively than those with other chronic diseases. Moreover, the more severe the functional impairment, the lower the self-reported quality of life for those with arthritis. Pain has been found to be correlated to reports of general health status, but even when the variable of pain is controlled, those with arthritis tend to be more depressed than people with other chronic diseases.

In the last five years, there has been an increase in the number of studies undertaken to explore patient-perceived quality of life after THR. Consensus on an operational definition of quality of life has not been achieved. There is support in the literature for improvement in quality of life, relief of pain and improvement in functional outcomes for those undergoing total joint replacement. Most studies have used a large sample size, although two studies used small samples: (O'Boyle, McGee, Hickey, O'Malley & Joyce, 1992, n = 20) and (Kelley, 1991, n = 22). Some common themes have emerged, such as women reporting better functional and role gains than men (Roush, 1985; Selman, 1989) and interdependence and social activity functions either not improving or improving less for older respondents (Selman, 1989). Conflicting data have been presented on the impact THR has on quality of life for single individuals versus those with mates (Selman, 1989; Wiklund & Romanus, 1991). Patients who have undergone THR report improvement in many dimensions being studied, yet their estimations of quality of life in certain areas (leisure, housework) is less than that measured in a healthy reference group (Wiklund & Romanus, 1991).

More research needs to be done to more clearly identify the groups of individuals at risk for no improvement in quality of life after THR.

There is also a need for replication of studies that have suggested that THR has improved quality of life as expressed in the four effector modes of self-concept, interdependence, role function, and physiologic function. This information in turn can be used to develop nursing interventions aimed at maximizing role function, self-concept, interdependence, and physiologic function.

Research Questions

The research questions addressed in this study were: 1) What impact does THR have on the quality of life as expressed in the four effector modes of physiologic function, self-concept, role function and interdependence? 2) Are there relationships between the subject characteristics of family income and education level and change scores in the four effector modes? 3) Are there differences between sex and marital status groups in change scores in the four effector modes?

Definition of Terms

1. Quality of life: health status as defined by the patient which includes adequacy of functioning in the four effector modes of self-concept, interdependence, role function and physiologic function as indicated by scores obtained on the Arthritis Impact Measurement Scales (AIMS) questionnaire, which includes the subscales of mobility, physical activity, social role, social activity, activities of daily living, pain, depression and anxiety. (See Appendix A for the AIMS).
2. Total hip replacement: elective surgical procedure which involves the prosthetic substitution of the acetabulum and femoral head for reasons of pain and disability.
3. Self-concept: "the composite of beliefs and feelings that one holds about oneself at a given time, formed from internal perceptions and

perceptions of other's reactions" (Roy, 1991, p. 270) as measured by score changes on items 34-45 of the AIMS.

4. Interdependence: "the close relationships of people that involve the willingness and ability to love, respect and value others, and to accept and respond to love, respect and value given by others" (Roy, 1991, p. 386), as measured by score changes on items 22-25 of the AIMS.

5. Role: "the functioning units of society; each role exists in relation to another". Consists of primary role, secondary role, tertiary role. Primary role: "an ascribed role based on age, sex, and developmental stage. It determines the majority of behaviors engaged in by a person during a particular growth period of life". Secondary role: "a role that a person assumes to complete the tasks associated with a developmental stage and primary role". Tertiary role: "a role that is freely chosen by a person, temporary in nature, and often associated with the accomplishment of a minor task in a person's current development" (Roy, 1991, p. 348) as measured by score changes on items 15-21 and 47 of the AIMS.

6. Physiologic function: The manner in which a person manifests physiological activity (Roy, 1991, p. 58). Those chemical, neurological and endocrine responses which allow the body to cope with the changing environment. This mode is focused on meeting the body's needs for oxygenation, nutrition, elimination, activity and rest and skin integrity. This function was measured by score changes on items 1-9, 26-33, 46, and 48 on the AIMS.

CHAPTER 3

METHODOLOGY

Study Design

Design and Variables

This replication study was conducted using a descriptive, correlational design. Since clients elected the surgical intervention of THR for themselves, randomization was not a characteristic of the study population. The variable of interest was the change in scores on the AIMS instrument, administered preoperatively and four months post-THR. Information on the demographic variables of sex, race, marital status, occupation, previous occupation if retired, education level, preoperative diagnosis and income was collected. The demographic information was analyzed to determine if extraneous variables other than THR have affected the change in the AIMS scores (See Appendix A for the AIMS instrument).

For the analysis of data, the items on the AIMS questionnaire were grouped according to their reflection of the four effector modes of physiologic function, self-concept, role function, and interdependence. The degree of change in scores from preoperative testing to postoperative testing was used to determine if a change in functioning in these four modes had occurred. The ability to attribute changes in the four effector modes to the independent variable of THR was

strengthened by pre-testing the study population prior to the THR intervention.

Study Site

The site for the study was a midwestern, 410-bed community teaching hospital with a 34-bed dedicated orthopaedic unit. Orthopaedics are an area of excellence for the hospital. Approximately thirteen orthopaedic surgeons perform surgery at the hospital, although not all perform THR (there are approximately eight surgeons who perform THR). The hospital also participates in an orthopaedic residency program with three other area hospitals. The unit is supported by a unit manager, a unit educator, and by two part-time orthopaedic Clinical Nurse Specialists. In 1992, 163 THRs were performed in this hospital.

Sampling Method and Population

The target population was all patients electing to undergo THR. The study used a sample of convenience that included individuals undergoing THR at the hospital from July 1994 to December 1994. Criteria for inclusion in the study were the ability to read and write English, an ability to comprehend the study, and a planned primary (first time) THR. Subjects were not eliminated based on their underlying pathology. No patients expired during the study period. Data were not collected on the development of complications such as pulmonary embolus, dislocation, or deep venous thrombosis.

Fifty subjects were enrolled in the study. Two pre-op surveys could not be used because the participants omitted greater than 12% of the items. One pre-op survey could not be used because the participant responded incorrectly to most of the items. One subject was eliminated because the THR was not a primary procedure. One subject's surgery was

cancelled due to many co-morbidities. There were 45 useable pre-op surveys.

Two subjects failed to respond to the post-op survey after follow up mailings at three weeks. There were a total of 43 useable pre- and post-op sets of data.

Approval process

Approval to conduct the study was obtained from the Human Subjects Review Committee at Grand Valley State University and the hospital's Nursing Research Committee. The Nursing Research Committee forwarded the proposal to the Institutional Review Board for information. Surgeons who perform THR were contacted prior to the study to obtain permission for their patients to participate. Surgeon support was reflected in letters addressed to the researcher (see Appendix B for letters of support).

Instrument

Quality of life was measured by The Arthritis Impact Measurement Scales (AIMS), a questionnaire developed by researchers at a Multipurpose Arthritis Center located at Boston University (Meenan, 1982). The instrument was developed to improve on previously available outcome measures which did not address all aspects (physical, psychological and social) of the World Health Organization's definition of health. The instrument has since been updated in a new version, the AIMS 2 (Meenan, personal correspondence, 1995).

The 66-item instrument, designed to measure multidimensional patient outcome in rheumatoid arthritis, consists of nine subscales. The subscales are: Mobility, Physical Activity, Dexterity, Household Activity, Social Activity, Activities of Daily Living, Pain, Depression, and Anxiety. There are four to seven items in each subscale. The

mobility subscale explores ability to get around both at home and in the community. The physical activity subscale addresses ability to walk, climb stairs, and perform vigorous activity. The dexterity subscale addresses ability to perform small motor tasks with the hands. The household activity subscale addresses meal preparation, shopping, housework, money management, and medication administration. The social activity subscale addresses face to face and phone contacts with friends/relatives. The activities of daily living subscale addresses bathing, toileting, dressing, and bed/chair activities. The pain subscale addresses severity, duration, and location of pain. The depression subscale addresses enjoyment of life in general, frequency of depressed feelings, ability to be "cheered up", and frequency of thoughts of death. The anxiety subscale addresses frequency of tense or calm feelings and ability to calm. In addition to these subscales, items 46-48 explore general estimates of health status, items 49-52 assess general health perceptions, item 53 estimates the overall impact of arthritis, item 54 estimates medication usage, items 55-57 explore for co-morbidity, and items 58-66 deal with demographics.

Factor analysis of the AIMS instrument initially revealed that it reflected three principal health dimensions: physical, psychological, and pain (Brown et al., 1984). Further studies support the expansion of health dimensions measured by the AIMS to five: lower extremity function, upper extremity function, affect, symptom, and social interaction (Mason, Anderson & Meenan, 1988).

Selman (1989) restructured the instrument to reflect Roy's four effector modes. In that study, all the instrument items were also reworded to reflect a retrospective focus, ("compared to before your THR surgery...") since patients were only surveyed postoperatively. The

items were similarly arranged for this study, with some differences of items included in the four variables and with the original wording preserved because of the pre-test, post-test design. Interdependence was measured by the social activity subscale from the AIMS, the same items Selman used. Physiologic function was measured by the mobility, physical activity, and ADL subscales, as well as two general health status items from the AIMS.

The items used to measure physiologic function differ somewhat from those Selman used. Selman left out the two general health status questions referring to overall health and status of arthritis in the last month. Two items were added to the physiologic function subscale in Selman's study that are not included in this study. One item was taken from the dexterity subscale of the AIMS and deals with ability to tie shoes. The other item was taken from the household activity subscale of the AIMS and deals with ability to shop for clothes and groceries. It was felt that the two general health status items reflect physiologic function and are appropriately included in this subscale. Ability to tie shoes was left out of this subscale because it was part of the AIMS Dexterity subscale, which reflects upper extremity function. The item dealing with shopping for groceries and clothes is from the AIMS household activity subscale, and is more appropriately included in the role function subscale for this study.

Role function was measured by the household activity subscale and one general health status item from the AIMS. The items used to measure role function also differ somewhat from Selman's study. Selman left out three of the AIMS household activity items included in the role function subscale for this study. These items deal with shopping for groceries and clothes, taking medicines, and using the telephone. It was felt

these AIMS household activity items reflect role function and are appropriately left in this subscale.

Self-concept was measured by the depression and anxiety subscales from the AIMS, the same items Selman used. The AIMS dexterity subscale was omitted because it deals exclusively with upper extremity function.

In summary, the original wording of the AIMS items was preserved in this study and items were recombined somewhat to better reflect Roy's four effector modes. The preservation of the instrument's original wording and the pre-test, post-test design improves upon the Selman study in that subjects do not have to rely on the recollection of their preoperative status. The originators of the tool encourage users to utilize the subscales appropriate to the subject under study. (See Appendix C for Permission to use the AIMS).

Reliability and validity of the AIMS

Reliability and validity for the AIMS have been studied extensively and widely reported. The authors claim construct validity because the tool was constructed based on the Index of Well Being, another instrument with established validity (Meenan, Gertman & Mason, 1980). The authors also claim face validity (Meenan, Gertman & Mason, 1980). Criterion-related validity was supported for the subscales of pain, anxiety, depression, dexterity and physical activity when scores on the instrument were correlated to four aspects of a treatment program for arthritis patients (Potts & Brandt, 1987). The four aspects of the treatment program were: obtain pain relief, increase ability to get around, obtain assistive devices to help perform daily activities, and discuss emotional concerns. Potts and Brandt (1987) hypothesized that patients' ratings of the importance of these areas would be associated with their scores on relevant subscales of the AIMS (the social activity

subscale was not used in this study because previous work by the authors indicated their patient population did not consider this an important aspect of their medical treatment program). The correlation of the importance of obtaining pain relief with scores on the AIMS Pain subscale was $r = .32$ ($p < .01$). The correlation of the importance of discussing emotional concerns with scores on the anxiety subscale was $r = .45$ ($p < .001$). The correlation of the importance of discussing emotional concerns with scores on the depression subscale was $r = .29$ ($p < .01$). The correlation of the desire to obtain assistive devices with the dexterity subscale was $r = .26$ ($p < .01$). The correlation of the importance of increasing ability to get around with the physical activity subscale was $r = .25$ ($p < .01$). A surprising finding was the lack of correlation between the importance of obtaining assistive devices and the ADL subscale of the AIMS. The authors tested their hypothesis that this finding was due to the fact that the group as a whole was only minimally impaired. When the group was divided on the basis of their scores on the ADL subscale, those who indicated greater impairment tended to indicate that obtaining assistive devices was an important aspect of their care ($r = .24$, $p < .05$). The mobility subscale was not found to be significantly correlated with the importance of getting around even when the group was divided on the basis of severity of impairment. The household activity subscale was found to be correlated with the importance of obtaining assistive devices only for women. The authors suggested that this AIMS subscale was biased toward traditionally "female" roles.

Further evidence for the validity of the AIMS was presented by Meenan, Gertman, Mason and Dunaif (1982). The AIMS was administered to 625 patients from 15 different sites in 10 different states with a

variety of disease types (rheumatoid arthritis, osteoarthritis, systemic lupus erythematosus, and others). Validity was assessed by correlating subscale scores with general and specific measures of disease activity which were assessed on a portion "slightly over 100" (p. 1049) of the total study sample. General measures of disease activity were the American Rheumatism Association Functional Class and recent arthritis activity, both rated by the patient's physician. The specific measures of disease activity were: walking time, grip strength, joint count, and range of motion, as measured by one physician or one of two physical therapists. All nine subscales were found to correlate significantly ($p < .001$) with both general standards. Correlations with functional class generally tended to be higher than correlations with disease activity. The subscales of mobility, physical activity, dexterity, household activities, activities of daily living and pain were more highly correlated with the specific physical measures than were the psychologic and social scales of anxiety, depression and social activity. Measures of lower extremity function (mobility and physical activity) were more strongly correlated to walking time than grip strength. The upper extremity function measure (dexterity) was more strongly correlated with grip strength ($r = .46$, $p < .001$) than walking time ($r = .12$, p value not reported). Household activities and activities of daily living were correlated in similar ways with the general and specific measures, demonstrating higher correlations with the general measures than with the specific measures. Correlation coefficients for pain were similar to the correlation coefficients for household activities and activities of daily living subscales, with the exception of its stronger correlation with joint count.

Reliability of the AIMS has also been supported in a number of studies. Meenan, Gertman, and Mason (1980) in the pilot study for the AIMS, administered the instrument to 104 patients with rheumatoid arthritis, osteoarthritis, connective tissue disorders, and other rheumatoid diseases. Guttman coefficients for reproducibility and scalability were estimated. Guttman coefficients for reproducibility for each of the subscales were: mobility (.91), physical activity (.94), social activity (.88), social role (.94), activities of daily living (.95), pain (.92), dexterity (.91), anxiety (.91), and depression (.91). Values of .90 and above were considered as acceptable by the authors. Guttman coefficients for scalability for each of the subscales were: mobility (.62), physical activity (.78), social activity (.56), social role (.73), activities of daily living (.61), pain (.78), dexterity (.72), anxiety (.75), and depression (.65). Levels of .60 or greater were accepted as evidence of scalability by the authors. In order to explore validity, Likert scales were constructed from the Guttman scales, since Guttman scales do not lend themselves to calculation of Pearson or Spearman correlation coefficients. The reliability of the Likert scales was estimated by calculating Cronbach's alpha. The coefficient alpha scores for the likert subscales were as follows: mobility (.85), physical activity (.76), social activity (.63), social role (.85), activities of daily living (.70), pain (.85), dexterity (.84), anxiety (.88), and depression (.88).

Reliability was further supported in 1982 when Meenan, Gertman, Mason and Dunaif administered the instrument to 625 patients from 15 different sites in 10 different states. Three methods were used to estimate reliability: internal consistency (using standardized item alpha), Guttman coefficients of reproducibility, and test-retest score

correlations over a two-week period. Although the actual numbers were not presented, the authors stated that the criterion levels for all the measures of reliability were exceeded for all subscales (the criterion level for standardized alpha was .70, the criterion for Guttman coefficient of reproducibility was .90, and the criterion for the two week test-retest was .80).

The AIMS has been compared to other instruments measuring quality of life for its utility, sensitivity and applicability to nursing settings. Many of the comparisons involve the Health Assessment Questionnaire (HAQ), a tool similar to the AIMS and developed at a Multipurpose Arthritis Center at Stanford University. The two instruments actually overlap by 65% (Brown et al., 1984). In one study comparing the AIMS and the HAQ with three other instruments on a sample of THR patients three months post surgery, the AIMS was found to be more efficient than the HAQ in the areas of Mobility, Pain, and Global indices of functional impairment, but less efficient than the HAQ for measuring change in Social Function. Goepfinger, Thomas Doyle, Charlton and Lorig (1988) compared the HAQ and AIMS in a sample of 140 patients with osteoarthritis, rheumatoid arthritis and diabetes mellitus and concluded that both were acceptable with regard to reliability and content validity, but questioned whether the HAQ might better reflect nursing diagnoses related to function than the AIMS. They advised caution with this interpretation, however, due to the questionable content validity of the nursing diagnoses themselves.

Other aspects of the AIMS make it useful for a study such as this one. The AIMS has been shown to be sensitive to short-term clinical changes occurring in as few as four weeks as a result of treatment (Meenan et al., 1984; Anderson, Firschein & Meenan, 1989). The AIMS

has even been translated into different languages and pilot tested in study populations overseas (Hendricson et al., 1989; Hill, Bird, Lawton & Wright, 1990; Taal, Jacobs, Seydel, Wiegman & Rasker, 1989).

Identification of Subjects

Fifty patients were approached to participate in the study. Subjects were identified through both the pre-admission testing appointment schedule and the Total Joint Class schedule. (Total Joint Class was a 2 1/2 hour preoperative educational session designed for patients and their significant others for the purpose of preparing them cognitively and emotionally for surgery). Most subjects were approached by the researcher, although a few were initially approached by the other Clinical Nurse Specialist or a pre-admission testing staff nurse familiar with the study. Those patients undergoing revision of a previous THR or conversion of a previous hip pinning to THR were not approached for the study.

Initial data collection (pre-test) for fifty subjects occurred from July to December 1994. Although the intent was to contact every eligible consecutive THR patient, the sample was one of convenience, with those subjects accessible to the researcher being approached. Postoperative data were collected from November 1994 until April 1995.

Procedure

Potential subjects were asked to consider participating in a study to explore how having THR affects quality of life. The Verbatim Instructions for Participants was read to subjects. The Verbatim Instructions for Participants included information on the purpose of the study, that participation involved the completion of a 15-20 minute questionnaire pre-operatively and four months post-operatively, and that all individual results would be kept strictly confidential (see Appendix

D for a copy of the Verbatim Instructions for Participants). Subjects were told that risks associated with the study were minimal, but that if responding to the survey caused emotional stress, the researcher would be available to refer them to an appropriate health care provider. Subjects then were asked to sign the consent form (see Appendix E for a copy of the consent form). All potential subjects who were approached were willing to participate in the study. The questionnaire was administered at that time, with additional instructions on how to record responses. Visual examples of how to fill out the visual analog scales were given. A card with the researcher's name, position, and home and work phone numbers was provided to all subjects. A few participants requested to take the questionnaire home to complete and brought them back on the day of surgery. Participants were able to request a summary of the results of the study by checking an item on the consent form.

Four months post-operatively, subjects were mailed the AIMS questionnaire with a letter re-explaining the study and a pre-addressed stamped envelope. Reminder notes were sent to those not responding to the study within three weeks.

Participant's confidentiality was preserved by coding surveys with numbers. Names were attached to the survey numbers only until the post-op surveys were collected, then the connection between the names and numbers was destroyed.

CHAPTER 4

DATA ANALYSIS

Techniques

As in the original AIMS instrument, the instrument modified for this study was edge-coded for data entry. Each subject was assigned a unique identification number.

As surveys were received, data were entered and cleaned. In the rare instance that more than one response for an item was selected by a participant, a coin toss was used to select the response to minimize the chance of introducing systematic error. Questionnaires with 12% or greater missing items were discarded.

Frequency tables were run for all instrument items and checked for missing values and outlier responses. Missing values were assigned either the digit nine or a blank field for data entry, depending on the item. Missing values for demographic items on time one data were obtained from time two data. Outlier responses were validated with the subject's completed survey. Data from the AIMS subscales mobility and physical activity (comprising the physiologic function scale) and from the subscales anxiety and depression (comprising the self-concept scale) were recoded for analysis. The level of significance was set at .05.

When the analysis of data began, it became evident that the three general health status questions previously added to the subscales of physiologic function and role function could not be included because of lack of evidence of validity and an inability to determine reliabilities

for these subscales with the items included. The items dealing with general health status were therefore excluded from the physiologic function and role function subscales and analyzed separately.

Reliability of Instrument

Alpha reliability coefficients were calculated for each of the subscales from the AIMS that were used in this study, as well as for the subscales of self-concept, role function and interdependence. No alpha reliability coefficient was calculated for the physiologic function subscale because the items from the AIMS combined for this subscale had widely varying response options. (The alpha coefficients for the AIMS subscales in this study were: mobility (.77), physical activity (.68), household activity (.75, three of the seven items in this subscale had zero variance), social activity (.67), ADL (.54, two of the four items in this subscale had zero variance), pain (.76), depression (.88), anxiety (.94), health perception (.65).) The reliability coefficients for three subscales in this study were: self-concept (.95), role function (.75, three of the seven items in this subscale had zero variance) and interdependence (.67).

Characteristics of Subjects

Forty-three useable pairs of preoperative and postoperative questionnaires were received from patients undergoing THR with seven different surgeons. The subjects ranged in age from 29 to 80 with a mean age of 67. Twenty-nine subjects were female and 14 were male. Forty-two subjects were Caucasian and one was African-American. Twenty-seven subjects were married (61%). Of the remaining subjects without mates, 11 (28%) were widowed, three (7%) were divorced and two were never married. More than half (54%) of the subjects were high school graduates. Nearly one-third (30%) had either attended or graduated from

college. Seven percent had professional or graduate school education. Nine percent of the subjects had not graduated from high school. Twenty-seven (63%) were retired, six (14%) classified themselves as "housewife", one was disabled and nine (21%) were currently employed. Thirty-nine (91%) of the subjects were diagnosed with osteoarthritis, one (2%) with rheumatoid arthritis, two (5%) with hip dysplasia and one (2%) with avascular necrosis of the femoral head. Nearly half of the subjects (49%) had been diagnosed with arthritis for less than ten years, while 51% had been diagnosed for 10 to 40 years. Thirty-two subjects (74%) had five years or less of hip pain prior to their THR, while the remaining subjects had 7 to 25 years of hip pain prior to undergoing THR. Fifteen (35%) of the subjects had an income of \$15,000 or lower, fifteen (35%) had incomes between \$15,000 and \$40,000, and eleven (25%) had incomes of \$40,000 or greater. Two subjects declined to respond to this item.

Research Questions

To answer the first research question ("What impact does THR have on the quality of life as expressed in the four effector modes of physiologic function, self-concept, role function and interdependence?"), the degree of change in each of the four effector modes was evaluated with paired t-tests. (For interpretation of results, the lower the group mean value, the higher the functioning in the mode being tested). There was significant improvement in scores for the self-concept, role, and physiologic modes, but no improvement in the scores for the interdependence mode. (See Table 1).

Overall subscale scores for self-concept improved for thirty-three subjects. The improvement in self-concept change scores ranged from .17 to 5.94. Overall subscale scores remained the same for two subjects.

For eight subjects, self-concept scores went down, but the negative change ranged from $-.17$ to $-.66$.

Overall subscale scores for role function improved for twenty-seven subjects. The improvement in role function change scores ranged from $.77$ to 3.08 . Overall subscale scores remained the same for twelve subjects. Role function scores went down for four subjects, and the negative change ranged from $-.77$ to -3.85 .

Overall subscale scores for physiologic function improved for thirty-eight subjects. The improvement in physiologic function change scores ranged from $.42$ to 5.33 . Overall subscale scores remained the same for three subjects. Physiologic function scores went down for two subjects (-1.67 and -2.08).

Overall subscale scores for interdependence improved for seventeen subjects. The improvement in interdependence change scores ranged from $.50$ to 5.00 . Overall subscale scores remained the same for seven subjects. Interdependence scores went down for nineteen subjects, and the negative change ranged from $-.50$ to -4.00 .

Table 1

Change Scores in the Four Effector Modes

	Physiologic Function	Self- concept	Role Function	Inter- dependence
Pre- operative	3.7888	3.1058	1.3072	3.4186
Post- operative	2.0291	1.8181	0.5372	3.4651
Difference	1.7597	1.2878	0.77	-0.0465
t	7.08***	5.63***	4.05***	-0.18

N = 43

* significant at .05

** significant at .01

*** significant at .000

The pain subscale from the AIMS was analyzed separately with paired t-tests. The lower the group mean value, the lower the reported pain. There was significant improvement postoperatively in the pain subscale scores. (See Table 2 for pain subscale results).

The visual analogs for arthritis activity and pain level were also analyzed with paired t-tests. The visual analogs were given scores in millimeters measured to the mark indicated by the respondent on the scale. The lower the group mean, the less pain and arthritis activity. There was improvement postoperatively for both the arthritis activity and pain visual analogs. (See Table 2 for arthritis activity and pain visual analog results).

Table 2

Pain Subscale and Arthritis and Pain Visual Analogs

	AIMS pain subscale	Arthritis visual analog	Pain visual analog
Pre-operative	6.3837	55.4419	59.3571
Post-operative	3.3256	24.0233	23.5238
Difference	3.0581	31.4186	35.8333
t	8.63***	8.62***	9.02***

N = 43

* significant at .05

** significant at .01

*** significant at .000

Three general health status items from the AIMS originally included in the physiologic function and role function subscales for this study were analyzed separately with the Wilcoxon Matched Pairs-Signed Ranks test. These data were ordinal level and were obtained from non-independent groups. The item asking about the subject's general health did not show significant change postoperatively (the lower the score, the better the estimate of general health). The item dealing with how the subject's health has interfered with "doing things" did show significant improvement postoperatively (the higher the score, the less health interfered with "doing things"). The item asking how active the subject's arthritis was in the past month did show significant improvement postoperatively (the higher the score, the less active

arthritis had been in the past month). (See Table 3 for general health status items change scores).

Table 3

General Health Status Items Change Scores

	General Health Status	Health Interfered with Doing Things	Arthritis Activity
Negative ranks	8	2	1
Positive ranks	7	28	33
Ties	28	12	9
z score	-0.2272	-4.2885****	-4.9323****

N = 43

* significant at .05

** significant at .01

*** significant at .000

**** significant at .0000

To answer the second research question, (Are there relationships between the subject characteristics of family income and education level and change scores in the four effector modes?), different subsamples (based on family income and education level) were correlated with the degree of change reported in the four effector modes using the Spearman's rho correlation coefficient.

Family income was not found to be significantly related to change scores in any of the four effector modes. Table 4 contains the

correlations for family income and education level with the four effector modes. Since income and education level were measured on an ordinal scale, the Spearman correlation was calculated. The Spearman correlation coefficients for family income ranged from $-.22253$ to $.12941$ and none were significant. The Spearman correlation coefficients for education level ranged from $-.14094$ to $.12501$, and none were significant.

Table 4

Correlation of Family Income and Education Level to Change Scores In the Four Effector Modes

	Self-concept	Role	Physiologic Function	Inter-dependence
Family Income	Spearman = $-.22253$	Spearman = $-.10036$	Spearman = $-.10036$	Spearman = $.12941$
Education Level	Spearman = $.12501$	Spearman = $.02984$	Spearman = $.02156$	Spearman = $-.14094$

$N = 43$

To answer the third research question, (Are there differences between sex and marital status groups in change scores in the four effector modes?), different subsamples (based on sex and marital status) were analyzed for the degree of change in the four effector modes using paired t-tests.

Males were not found to be different from females in change scores in any of the four effector modes. Paired t-tests were used to compare sex groups and their change scores, and none were significant. (See

Table 5 for differences in sex and change scores in the four effector modes).

Table 5

Differences in Sex and Change Scores in the Four Effector Modes

	Self Concept	Role	Physiologic Function	Inter-dependence
Male mean N = 14	0.8721	0.605	1.369	0
Female mean N = 29	1.4884	0.8497	1.9483	-0.069
t	1.27	0.6	1.3	-0.12

Married persons were not found to be different from single in change scores in any of the four effector modes. Paired t-tests were used to compare married and single persons and their change scores. None were significant. (See Table 6 for differences in marital status and change scores in the four effector modes).

Table 6

Differences in Marital Status and Change Scores in the Four Effector Modes

	Self Concept	Role	Physiologic Function	Inter-dependence
Married mean N = 27	1.0433	0.77	1.5865	0.2692
Single mean N = 16	1.6616	0.77	2.0245	-0.5294
t	-1.33	0	-0.78	1.54

The demographic variables of family income, educational level, marital status, and sex were also analyzed with respect to change scores on the arthritis activity and pain visual analogue scales with t-tests. The only variable found to be significantly different in change scores on either visual analogue scale was marital status. Those without partners reported a greater degree of improvement on the arthritis activity visual analogue scale than those with partners. The preoperative mean score on the arthritis activity visual analogue scale for married subjects was 48.08 with a postoperative mean score of 23.46. For the subjects without partners, the preoperative mean score on the arthritis activity visual analogue scale was 66.71 and the postoperative mean score was 24.88. The mean change score on the arthritis activity visual analogue for subjects with partners was 24.62 and for those without partners was 41.83 ($t = -2.44$, $p = .019$). (See Table 7 for differences in marital status and arthritis and pain visual analog scores).

Table 7

Differences in Marital Status and Arthritis Activity and Pain Visual Analog Scores

	Arthritis Visual Analog Change Score	Pain Visual Analog Change Score
Married mean N = 27	24.6154	31.0385
Single mean N = 16	41.8235	43.625
t	-2.44*	-1.56

* significant at .05

In summary, undergoing THR did improve quality of life as expressed in the three effector modes of self-concept, role and physiologic function. Scores on the interdependence subscale did not show improvement postoperatively. The only demographic variable found to be significantly different in change score was marital status.

Other Findings of Interest

Nine participants wrote personal letters accompanying their postoperative questionnaires, expressing how happy they were with the results of their THR. Four participants wrote to say that although they had experienced success with their THR, arthritis had begun to cause their opposite hip to be painful and they were planning replacement of the opposite hip in the near future. One participant similarly had good success with her THR, but because of arthritis in a knee, was planning a Total Knee Replacement.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

This study measured functioning in the four effector modes of physiologic function, self-concept, role function and interdependence prior to and four months after THER. The focus of data analysis was to detect changes in the four effector modes in order to determine how THER affects quality of life. Although this study attempted to measure the impact THER had on the quality of life using Roy's Adaptation Model as a framework, the findings provided information on additional questions : Are there characteristics that indicate certain subjects are at risk for either a decrease or no change in quality of life? If so, what nursing interventions can be identified that will enhance the positive change in quality of life or avert a possible decrease in quality of life after THER?

Reliability of Instrument

The reliability coefficients for the AIMS instrument used in this study were generally high. Reliability coefficients for the self-concept and role function subscales were .95 and .75, respectively. The reliability coefficient for the interdependence subscale was .67. The items combined from the AIMS to form the physiologic function subscale had such widely varying response options that calculation of a reliability coefficient was not possible. Reliability coefficients calculated for the AIMS subscales used in this study exceeded .70 for

every subscale except physical activity (.68), social activity (.67), and ADL (.54, two of the four items in this subscale had zero variance).

Discussion of Findings

This study supports the usefulness of THR in improving the quality of life as measured by the AIMS in a mostly white, well-educated, retired sample. Evidence for improvement in the effector modes of self-concept, role function, and physiologic function was found. There was no evidence to support improvement in the interdependence mode, however. It is possible that the social activity subscale of the AIMS (which was used as the interdependence subscale for this study) did not measure the "close relationships of people that involve the willingness and ability to love, respect and value others, and to accept and respond to love, respect and value given by others" (Roy, 1991, p. 386). It is also possible that undergoing THR did not significantly impact this capacity in this population.

This study did not show that the demographic variables of sex, marital status, income and education were related significantly to change scores, except on the visual analogue for arthritis activity. Subjects without mates experienced a greater degree of positive change on the arthritis activity visual analogue than those with partners. Unmarried subjects perceived themselves as more disabled pre-operatively than married subjects, and both groups were similar in their perceptions of disability post-operatively. It could be speculated that unmarried subjects performed more ADLs sooner for themselves out of necessity and therefore rated their arthritis activity lower postoperatively. Conversely, it is possible that subjects with partners received more assistance with ADLs postoperatively from their mates and therefore their perception of improvement of arthritis activity was less.

Findings of this Study Compared to Selman's Study Findings

Since Selman (1989) surveyed THR subjects once twelve to twenty-four months postoperatively, the items on the AIMS questionnaire were reworded and subjects were asked to recall their current status compared to their preoperative status. Positive values were assigned to the responses indicating a positive impact since surgery, and negative values were assigned to responses indicating a negative impact since surgery. Those responses indicating no change were assigned a zero. Selman (1989) also found that subjects experienced improvement in the modes of self-concept (76% reported a positive change), role function (83% reported a positive change), and physiologic function (94% reported a positive change). As in this study, there was no improvement noted in the interdependence mode (46% reported a positive change).

When demographic variables were examined in relation to subject's estimations of change since surgery, younger subjects reported more improvement in interdependence than older subjects, females reported more improvement in role function than did males, and those without partners reported more improvement in self-concept than those with partners. None of these findings are supported in the current study, although age was not tested in relationship to change scores in the four effector modes.

Limitations of this Study

One significant limitation of this study is the relative lack of evidence for the validity of the AIMS with respect to its capacity to measure functioning in the four effector modes of Roy's Adaptation Theory. The assigning of AIMS subscales to subscales representing the four effector modes was based on the previous study by Selman (1989) and

the judgement of this researcher. More evidence on the validity of the AIMS for measuring function in the four effector modes is necessary.

Another limitation is the lack of representativeness of the study sample. The sample size was relatively small. The sample was homogeneous with regard to race. Furthermore, the subjects in this sample were generally very well educated; many possessed larger than average incomes. Most of the subjects undergoing THR in this study had been diagnosed with osteoarthritis preoperatively (only one had been diagnosed with rheumatoid arthritis preoperatively). The homogeneity of this population with regard to these characteristics make it difficult to generalize the results of this study. A larger sample from more than one site would strengthen the generalizability of the results to the THR population.

Suggestions for Future Research

More evidence for the ability of the AIMS to measure functioning in the four effector modes of self-concept, role, physiologic function, and interdependence is necessary. Content validity of the AIMS for ability to measure functioning in the four effector modes could be established by consulting a panel of experts on Roy's Adaptation Theory.

Although there have been several studies supporting the notion that THR improves quality of life, more similar studies with larger sample sizes would strengthen the findings of this study. Further exploration of the relationship of demographic characteristics and change scores could help to identify and predict which characteristics are associated with less positive change after THR. Similar studies involving subjects electing to undergo Total Knee Replacement (TKR) could be undertaken to explore quality of life after TKR.

The developers of the AIMS at Boston University have completed a new version of the AIMS. Replication of this study with the newest version of the AIMS is recommended.

The overwhelming majority of white subjects in this study raises the questions of access to the option of THR for minorities. Exploring the perceptions of access to elective total joint replacement as an option for minorities might help to shed light on this issue.

Comparing quality of life after THR for those discharged home versus those transferred to a rehabilitation facility would give helpful information on the most effective method of returning to function for this population. With the rapid shift from hospital care to shorter in-patient stays with extended care in a sub-acute facility, comparing these populations for quality of life after THR would give helpful information on planning and outcomes after THR.

Application to Practice, Administration and Education

This study did not identify clear factors or certain subject characteristics that would predict less improvement in quality of life after THR. Despite this, the nurse should perform first level assessment preoperatively, being alert to areas of concern identified in the patient's functioning in the four effector modes. Focal, contextual, and residual stimuli contributing to the patient's ability to function or experience gains postoperatively in the effector modes should be identified. Areas of concern with pertinent focal stimuli should be addressed as the plan of care is developed with the client. Postoperatively, nurses should be alert to functioning in the four effector modes, assessing for areas of concern, manipulating the environment when necessary to support or help improve patient's level of functioning.

Interdependence was the only effector mode not showing improvement postoperatively both in this study and in the Selman study (1989). Despite the lack of certainty that the social activity subscale of the AIMS has validity for measuring interdependence, the nurse should focus special attention preoperatively in assessment of functioning in the interdependence mode. Focal, contextual and residual stimuli contributing to the preoperative level of functioning in the interdependence mode should be analyzed carefully with the patient to determine interventions to maximize functioning in this mode postoperatively.

Education for patients undergoing THR should be comprehensive and include information on the procedure, the recovery process, setting realistic expectations, and their responsibilities in their recovery. Education should begin prior to admission and should continue throughout hospitalization. Education should include family members or a significant other who will be assisting the patient during the recovery process. Sharing research results that show improvement postoperatively in functioning and pain levels can be a source of encouragement for patients and significant others.

Nursing educators can help prepare students to care for clients undergoing THR by reviewing nursing research studies that identify how quality of life is affected by THR. Students can be alert to assessment findings that may place clients at risk for no improvement in quality of life and develop interventions that manipulate focal, contextual or residual stimuli to enhance quality of life for clients.

Nursing administrators are under pressure to create innovative solutions to dwindling resources and shorter lengths of stay for patients. The special needs of patients undergoing THR can be addressed

through preoperative educational programs and home environment assessments, postoperative programs such as educational/support groups, visiting nurse or therapist programs, and coordination of the discharge plan to facilitate seamless transitions for patients.

APPENDICES

APPENDIX A

MODIFIED ARTHRITIS IMPACT MEASUREMENT SCALES (AIMS)

Modified Arthritis Impact Measurement Scales

Instructions: Please answer the following questions about the way your hip arthritis (or total hip replacement surgery) has affected your life. Circle the appropriate number to indicate your answer. Try to answer every question.

Do Not Write
In This Section

ID _____
(1-2)

Record _____
(3)

1. When you travel around your community, does someone have to assist you because of your health? (Circle one number)

Yes-----1

No-----2

(4)

2. Are you able to use public transportation?

No, because of my health-----1

No, for some other reason-----2

Yes, able to use public transportation-----3

(5)

3. Do you have to stay indoors most or all of the day because of your health?

Yes-----1

No-----2

(6)

4. Are you in bed or in a chair for most or all of the day because of your health?

Yes-----1

No-----2

(7)

5. Does your health limit the kind of vigorous activities you can do such as running, lifting heavy objects or participating in strenuous sports?

Yes-----1

No-----2

(8)

6. Do you have any trouble either walking several blocks or climbing a few flights of stairs because of your health?

Yes-----1

No-----2

(9)

7. Do you have trouble bending, lifting or stooping because of your health?

Yes-----1

No-----2

(10)

8. Do you have any trouble either walking **one** block or climbing **one** flight of stairs because of your health?

Yes-----1

No-----2

(11)

9. Are you unable to walk unless you are assisted by another person or by a cane, crutches, artificial limbs, or braces?

Yes-----1

No-----2

(12)

10. If you had the necessary transportation:

Could you go shopping for groceries or clothes...

Without help (taking care of all shopping needs yourself)-----1

With some help (need someone to go with you to help on all shopping trips)-----2

Or are you completely unable to do any shopping-----3

(13)

11. If you had a kitchen:

Could your prepare your own meals...

Without help (plan and cook full meals yourself)-----1

With some help (can prepare some things but unable to cook full meals yourself)-----2

Or are you completely unable to prepare any meals-----3

(14)

12. If you had household tools and appliances (vacuum, mops, etc.):
- Could you do your own housework...
- Without help (can clean floors, windows, refrigerator, etc.)-----1
- With some help (can do light housework, but need help with some heavy work)-----2
- Or are you completely unable to do any housework-----3
-
- (15)
13. If you had laundry facilities (washer, dryer, etc.):
- Could you do your own laundry...
- Without help (take care of all laundry yourself)-----1
- With some help (can do small items only)-----2
- Or are you completely unable to do any laundry-----3
-
- (16)
14. If you had to take medicine:
- Could you take all your own medicine...
- Without help (in the right doses at the right time)-----1
- With some help (able to take medicine if someone prepares it for you and/or reminds you to take it)-----2
-
- (17)
15. Do you handle your own money?
- Without help (write checks, pay bills, etc.)-----1
- With some help (day to day, but need help budgeting, etc.)-----2
- Or are you completely unable to handle any money-----3
-
- (18)
16. If you had a telephone would you be able to use it?
- Without help-----1
- With some help (can answer phone or dial operator in an emergency, but need a special phone or help in getting the number or dialing)-----2
- Or are you completely unable to use the telephone-----3
-
- (19)

17. During the **past month**, about how often did you get together with friends or relatives?

Every day-----1
 Several days a week-----2
 About once a week-----3
 Two or three times in the past month-----4
 Once in the past month-----5
 Not at all in the past month-----6

(20)

18. During the past month, about how often have you had friends or relatives over to your home?

Every day-----1
 Several days a week-----2
 About once a week-----3
 Two or three times in the past month-----4
 Once in the past month-----5
 Not at all in the past month-----6

(21)

19. During the past month, how often have you visited with friends or relatives at their homes?

Every day-----1
 Several days a week-----2
 About once a week-----3
 Two or three times in the past month-----4
 Once in the past month-----5
 Not at all in the past month-----6

(22)

20. About how often were you on the telephone with close friends or relatives during the past month?

Every day-----1
 Several days a week-----2
 About once a week-----3
 Two or three times in the past month-----4
 Once in the past month-----5
 Not at all in the past month-----6

(23)

21. When you bathe, either a sponge bath, tub or shower, how much help do you need?

No help at all-----1

Help with bathing one part of your body, like back or leg-----2

Help in bathing more than one part of your body-----3

(24)

22. How much help do you need in getting dressed?

No help at all-----1

Only need help in tying shoes-----2

Need help in getting dressed-----3

(25)

23. How much help do you need to use the toilet?

No help at all-----1

Only need help in getting to or using the toilet-----2

Not able to get to the bathroom at all-----3

(26)

24. How well are you able to move around?

Able to get in and out of bed or chairs without the help of another person-----1

Need the help of another person to get in and out of bed or chair-----2

Not able to get out of bed-----3

(27)

25. During the **past month**, how would you describe the arthritis pain you usually have?

Very severe-----1

Severe-----2

Moderate-----3

Mild-----4

Very mild-----5

None-----6

(28)

26. During the **past month** how often have you had severe pain from your arthritis?

Always-----1
Very often-----2
Fairly often-----3
Sometimes-----4
Almost never-----5
Never-----6

(29)

27. During the past month, how long has your morning stiffness usually lasted from the time you wake up?

Over four hours-----1
Two to four hours-----2
One to two hours-----3
Thirty minutes to an hour-----4
Less than thirty minutes-----5
Do not have morning stiffness-----6

(30)

28. During the past month, how often have you had pain in two or more joints at the same time?

Always-----1
Very often-----2
Fairly often-----3
Sometimes-----4
Almost never-----5
Never-----6

(31)

29. During the past month, how much of the time have you enjoyed the things you do?

All of the time-----1
Most of the time-----2
A good bit of the time-----3
Some of the time-----4
A little of the time-----5
None of the time-----6

(32)

30. During the **past month**, how much of the time have you felt tense or "high strung" ?

All of the time-----1
Most of the time-----2
A good bit of the time-----3
Some of the time-----4
A little of the time-----5
None of the time-----6

(33)

31. How much have you been bothered by nervousness, or your "nerves" during the past month?

Extremely so, to the point where I could not take care of things-----1
Very much bothered-----2
Bothered quite a bit by nerves-----3
Bothered some, enough to take notice-----4
Bothered just a little bit by nerves-----5
Not bothered at all by this-----6

(34)

32. How often during the past month did you find yourself having difficulty trying to calm down?

Always-----1
Very often-----2
Fairly often-----3
Sometimes-----4
Almost never-----5
Never-----6

(35)

33. During the past month, how much of the time have you been in low or very low spirits?

All of the time-----1
Most of the time-----2
A good bit of the time-----3
Some of the time-----4
A little of the time-----5
None of the time-----6

(36)

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34. How much of the time during the **past month** did you feel relaxed and free of tension?

All of the time-----1
 Most of the time-----2
 A good bit of the time-----3
 Some of the time-----4
 A little of the time-----5
 None of the time-----6

(37)

35. How much of the time during the past month have you felt downhearted and blue?

All of the time-----1
 Most of the time-----2
 A good bit of the time-----3
 Some of the time-----4
 A little of the time-----5
 None of the time-----6

(38)

36. How often during the past month did you feel that nothing turned out the way you wanted it to?

Always-----1
 Very often-----2
 Fairly often-----3
 Sometimes-----4
 Almost never-----5
 Never-----6

(39)

37. How much of the time during the past month have you felt calm and peaceful?

All of the time-----1
 Most of the time-----2
 A good bit of the time-----3
 Some of the time-----4
 A little of the time-----5
 None of the time-----6

(40)

38. During the **past month**, how often did you feel that others would be better off if you were dead?

Always-----1
Very often-----2
Fairly often-----3
Sometimes-----4
Almost never-----5
Never-----6

(41)

39. How much of the time during the past month were you able to relax without difficulty?

All of the time-----1
Most of the time-----2
A good bit of the time-----3
Some of the time-----4
A little of the time-----5
None of the time-----6

(42)

40. How often in the past month have you felt so down in the dumps that nothing could cheer you up?

Always-----1
Very often-----2
Fairly often-----3
Sometimes-----4
Almost never-----5
Never-----6

(43)

41. In general would you say your health is excellent, good, fair or poor?

Excellent-----1
Good-----2
Fair-----3
Poor-----4

(44)

42. Thinking about the **past month**, how much of the time has your health kept you from doing the kinds of things that you should be able to do?

All of the time-----1
Most of the time-----2
Some of the time-----3
None of the time-----4

(45)

43. During the past month how active has your arthritis been?

Very active-----1
Moderately active-----2
Mildly active-----3
Not at all active-----4

(46)

Note: In answering the next four questions, please circle the number that best describes how you feel about each statement.

44. I seem to get sick a little easier than other people.

Definitely true-----1
Mostly true-----2
Don't know-----3
Mostly false-----4
Definitely false-----5

(47)

45. I never worry about my health.

Definitely true-----1
Mostly true-----2
Don't know-----3
Mostly false-----4
Definitely false-----5

(48)

46. My body seems to resist illness very well.

- Definitely true-----1
Mostly true-----2
Don't know-----3
Mostly false-----4
Definitely false-----5

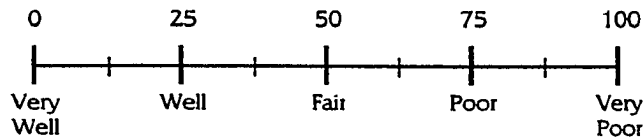
(49)

47. When there is something going around, I usually catch it.

- Definitely true-----1
Mostly true-----2
Don't know-----3
Mostly false-----4
Definitely false-----5

(50)

48. Considering all the ways your arthritis affects you, mark (X) on the scale for how well you are doing.



(51-53)

(Circle one number for each question)

49. During the past month how often have you had to take medication for your arthritis?

- Always-----1
Very often-----2
Fairly often-----3
Sometimes-----4
Almost never-----5
Never-----6

(54)

50. Is your health currently affected by any of the following medical problems? (please circle yes or no for **each one**)

High blood pressure-----	Yes No	(55)
Heart disease-----	Yes No	(56)
Mental illness-----	Yes No	(57)
Diabetes-----	Yes No	(58)
Cancer-----	Yes No	(59)
Alcohol or drug abuse-----	Yes No	(60)
Lung disease-----	Yes No	(61)
Kidney disease-----	Yes No	(62)
Liver disease-----	Yes No	(63)
Stomach or blood disease-----	Yes No	(64)

51. Do you take medicine every day for any problem other than your arthritis?

Yes-----	1	(65)
No-----	2	

52. Did you see a doctor more than three times last year for any problem other than arthritis?

Yes-----	1	(66)
No-----	2	

Please provide the following information about yourself:

53. What is your age at this time? (Please fill in)_____ (67-68)

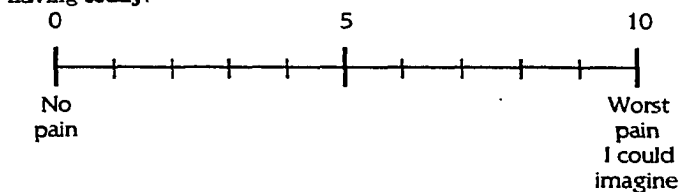
54. How many years have you had your arthritis?_____ (69-70)

55. How many years have you had hip pain?_____ ID (1-2)

REC (3)

(4-5)

56. Please mark an (X) on the scale to indicate how much pain you are having **today**.



(6-8)

57. What is your sex?

Female-----1
Male-----2

(9)

58. What is your racial background?

White-----1
Black-----2
Hispanic-----3
Oriental or Pacific Islander-----4
American Indian or Alaskan Native-----5
Other-----6

(10)

59. What is your current marital status?

Married-----1
Separated-----2
Divorced-----3
Widowed-----4
Never married-----5

(11)

60. What is your occupation? Indicate student, housewife, disabled, retired or unemployed, if appropriate. _____

(12-13)

61. If you are retired, disabled or unemployed, what was your previous occupation? _____

(14-15)

62. Please circle the highest level of education you received.

- Professional or graduate school-----1
- College graduate-----2
- One to four years of college-----3
- High school graduate-----4
- Grades ten through eleven-----5
- Grades seven through nine-----6
- Less than seven years of school-----7

(16)

63. What is your approximate family income?

- Less than \$5,000-----1
- \$5,000 - \$10,000-----2
- \$10,000 - \$15,000-----3
- \$15,000 - \$20,000-----4
- \$20,000 - \$25,000-----5
- \$25,000 - \$40,000-----6
- \$40,000 - \$65,000-----7
- More than \$65,000-----8

(17)

This is the end of the Modified Arthritis Impact Measurement
questionnaire.

Thank you very much for your help.

APPENDIX B

PHYSICIAN LETTERS OF SUPPORT



KENT
ORTHOPAEDIC
ASSOCIATES, P.C.

BRIAN L. HOTCHKISS, M.D.
Pediatric Specialist
THOMAS A. MALVITZ, M.D.
ROBERT L. DE MAAGD, M.D.
KENNETH J. EASTON, M.D.

May 10, 1994

Terry L. Holwerda
650 Griswold, S. E.
Grand Rapids, Michigan

Dear Terry:

I received your request with regard to involvement of my patients in your master's thesis study, entitled "The Impact of Total Hip Replacements on Quality of Life; a Replication."

This letter is to express my support for the utilization of my patients, subject to the patients' approval, in the study. I would be willing to permit the inclusion of my patients in this study to be surveyed with your arthritis impact measuring scales, both prior to and four months' post total hip replacement.

You may contact my office staff to identify potential subjects prior to their scheduled surgery and pre-admission testing appointments.

Certainly, I wish you the best in your endeavors and feel this is an extremely timely and important project to assist in the development of a data base for patients undergoing total hip arthroplasties.

Sincerely,

Thomas A. Malvitz, M. D.

TAM/bsc

WESTERN MICHIGAN BONE AND JOINT SURGEONS, P.C.
ORTHOPAEDIC SURGERY

WALTER M. BRAUNOHLER, M.D., F.A.C.S.
ROY W. WADDELL, M.D.

EAST PARIS MEDICAL BUILDING, SUITE 118
1000 EAST PARIS RD., S.E.
GRAND RAPIDS, MICHIGAN 49546
(616) 949-8945

ARTHROSCOPIC SURGERY
TOTAL JOINT REPLACEMENT
FRACTURES
SURGERY OF THE HAND

May 10, 1994

Teri L. Holwerda, R.N.
Orthopaedic Clinical Nurse Specialist
650 Griswold, S.E.
Grand Rapids, MI 49507

RE: Master's Thesis Study

Dear Teri:

This letter is to express my support for the Master's Thesis Study being undertaken entitled "The Impact of Total Hip Replacement on Quality of Life--a Replication." I am aware that data will be collected at Blodgett Memorial Medical Center from patients undergoing Total Hip Replacement (THR). I permit the inclusion of my patients in this study, to be surveyed with the Arthritis Impact Measurement Scales both prior to and four months post-THR. I am willing to have you contact my office staff to identify potential subjects prior to their scheduled surgery and pre-admission testing appointment.

Yours truly,



Roy W. Waddell, M.D.

RWW:ljc

WESTERN MICHIGAN BONE AND JOINT SURGEONS, P.C.
ORTHOPAEDIC SURGERY

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ARTHROSCOPIC SURGERY
TOTAL JOINT REPLACEMENT
FRACTURES
SURGERY OF THE HAND

May 9, 1994


Teri L. Holdwerda, R.N.
Orthopaedic Clinical Nurse Specialist
650 Griswold, S.E.
Grand Rapids, MI 49507

RE: Master's Thesis Study

Dear Teri:

I permit inclusion of my patients in your study for your Master's Thesis. Please contact Rene in my office to identify potential subjects.

Sincerely yours,


Walter M. Braunohler, M.D.

WMB:ljc



**KENT
ORTHOPAEDIC
ASSOCIATES, P.C.**

BRIAN L. HOTCHKISS, M.D.
Pediatric Specialist
THOMAS A. MALVITZ, M.D.
ROBERT L. DE MAAGD, M.D.
KENNETH J. EASTON, M.D.

May 5, 1994

Mr. Terry Holwerda
Blodgett Memorial Medical Hospital
1840 Wealthy Street, S. E.
Grand Rapids, Michigan 49506

Dear Terry:

This letter is to express my support for your master's thesis study. As far as I am concerned, you may interview my patients, if they agree to undergo this study.

Sincerely,

Robert L. DeMaagd, M. D.

RLD/bsc

***Total Hip and Knee Replacement Surgery
Revision Hip and Knee Surgery***

Clarence E. Walls, M.D.
Suite 202, Ramona Medical Center
515 Lakeside Dr. S.E.
Grand Rapids, Michigan 49506
(616) 459-9944

May 11, 1994

Teri L. Holwerda, R.N., B.S.N., O.N.C., Masters Student
Orthopaedic Clinical Nurse Specialist
650 Griswold, SE
Grand Rapids, Michigan 49507

Dear Teri:

This is a letter to express my support for the Master's Thesis Study being undertaken entitled The Impact of Total Hip Replacement on Quality of Life of Replication. I permit the inclusion of my patients in this study to be surveyed with the Arthritis Impact Measurement Scales both prior to and four months post-op total hip replacement. I am willing to have you contact my office staff to identify potential subjects prior to their scheduled surgery and Pre-Admission Testing appointment. I am also aware that data will be collected at Blodgett Memorial Medical Center from patients undergoing these procedures.

Sincerely yours,



Clarence E. Walls, M.D.

CEW/kvw

B. KENT MAUPIN, M.D., P.C.

Surgery of the Hand, Wrist, Elbow and Shoulder.

Arthritis Surgery and Total Joint Replacement.

June 2, 1994

Teri L. Holwerda, R.N., B.S.N., O.N.C.
Orthopaedic Clinical Nurse Specialist
650 Griswold SE
Grand Rapids, Michigan 49507

Dear Ms. Holwerda:

This letter is to express my support for the Master's Thesis study being undertaken, entitled "The Impact of Total Hip Replacement on Quality of Life -- A Replication." I am aware that data will be collected at Blodgett Memorial Medical Center from patients undergoing total hip replacement (THR). I permit the inclusion of my patients in this study, to be surveyed with the Arthritis Impact Measurement Scales, both prior to and four months post THR. I am willing to have you contact my office staff to identify potential subjects prior to their scheduled surgery and pre-admission testing appointments.

Sincerely, 



B. Kent Maupin, M.D.

/ddp

Blodgett Professional Building • 1900 Wealthy, S.E. • Suite 290-B • Grand Rapids, Michigan 49506
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Teri Holwerda:

This letter is to express my support for the Master's Thesis study being undertaken entitled "The Impact of Total Hip Replacement on Quality of Life--a Replication". I am aware that data will be collected at Blodgett Memorial Medical Center from patients undergoing Total Hip Replacement (THR). I permit the inclusion of my patients in this study, to be surveyed with the Arthritis Impact Measurement Scales both prior to and four months post-THR. I am willing to have you contact my office staff to identify potential subjects prior to their scheduled surgery and pre-admission testing appointment.

Sincerely,

A black rectangular box redacting the signature of Teri Holwerda.A handwritten flourish or scribble, possibly a stylized 'H' or a signature mark, extending from the bottom left of the redacted signature box.

APPENDIX C

PERMISSION TO USE THE ARTHRITIS IMPACT MEASUREMENT SCALES

B O S T O N U N I V E R S I T Y M E D I C A L C E N T E R

BOSTON UNIVERSITY SCHOOL OF MEDICINE SCHOOL OF PUBLIC HEALTH • THE UNIVERSITY • SCHOOL OF NURSING • BOSTON UNIVERSITY SCHOOL OF GRADUATE DENTISTRY



Boston University
School of Medicine

The
Arthritis
Center

Conte Building
80 East Concord Street
Boston, Massachusetts
02118-2394
617 638-4310

Affiliated with
Boston City Hospital
The University Hospital
Boston
Veterans Administration
Medical Center

March 29, 1990

Teri L. Holwerda, BSN, RN
Blodgett Memorial Medical Ctr. (3C)
1840 Wealthy Street, S.E.
Grand Rapid, Mich. 49506

Dear Ms. Holwerda,

I was pleased to learn of your interest in using our AIMS instrument as part of your thesis research for a Master's degree in nursing.

I am enclosing a copy of the AIMS questionnaire as well as a brief user's guide that describes how it can be scored. You have permission to make as many copies of the AIMS as you need for your research.

Best of luck with your study.

Sincerely,

[Redacted Signature]

Robert F. Meenan, MD, MPH
Professor of Medicine
Arthritis Section Head

RFM:br

Enclosure

APPENDIX D

VERBATIM INSTRUCTIONS FOR SUBJECTS

My name is Teri Holwerda and I am a Master's student in nursing at Grand Valley State University. I am requesting your participation in a study to identify how having total hip replacement surgery affects quality of life. Your participation will involve filling out a questionnaire asking about your level of pain, your feelings and emotions, your relationships with other important people in your life, and your ability to perform certain physical tasks. You will be asked to fill out this questionnaire twice: once today during your pre-admission testing visit, and once four months after your surgery, when it will be mailed to your home. It will take about 15-20 minutes to fill out each time. Knowledge gained from this study is expected to assist nurses and physicians to provide care which will be responsive to the needs of people having total hip replacement.

It is not expected that participation in this study will cause you any ill effects or discomfort. However, if you should experience anxiety or emotional upset because of your participation in this study, you may contact Teri Holwerda to receive a referral for assistance. All your responses will be kept strictly confidential, and no one will be able to identify your individual responses. Each questionnaire will have its own number. Names will only be attached to the questionnaire numbers until the information is collected, then the connection between your name and the questionnaire will be destroyed. Any reports of this study will only disclose group data. You are also entitled to receive a copy of the results of this study if you so desire. You may withdraw from this study at any time without affecting your care at Blodgett Memorial Medical Center.

Do you have any questions about the study? Do you have any difficulty reading or writing English? Do you have any objections to having a questionnaire mailed to your home four months after surgery? Do you have any objections to allowing the group data from this study to be released in a research report in a scientific journal?

My phone number is: 616-241-5570. You may call me at any time if you have questions about the study. Thank you for your participation!

Here is the first questionnaire. It will take about 15-20 minutes to fill out. Please turn it in to the secretary when you are finished. I will be available to you during your completion of the questionnaire to answer any questions you may have.

APPENDIX E

CONSENT FORM

Impact of Total Hip Replacement on Quality of Life

A Replication

I understand that this is a study to identify how quality of life is affected by Total Hip Replacement surgery and that the knowledge gained is expected to help nurses and physicians to provide health care in a manner which will be responsive to the needs of people undergoing Total Hip Replacement.

I also understand that:

1. Participation in this study will involve filling out a questionnaire at the hospital at the time of pre-admission testing and again four months later, when another questionnaire will be mailed to my home.
2. This questionnaire will ask me about my level of pain, my emotions, my relationships with other important people in my life, my feelings and my ability to perform certain physical tasks.
3. I have been selected to participate because I have chosen to have Total Hip Replacement surgery.
4. It is not anticipated that this study will lead to physical or emotional risk to myself.
5. The information I provide will be kept strictly confidential and the data will be coded so that identification of individual participants will not be possible.
6. Any reports of this study will only refer to group data and will not identify my individual responses on the questionnaire.
7. A summary of the results will be made available to me at my request.

I acknowledge that:

1. I have been given an opportunity to ask questions regarding this research study and that these questions have been answered to my satisfaction.

2. In giving my consent, I understand that my participation in this study is voluntary and that I may withdraw at any time without affecting the care I receive from my physician or the staff at Blodgett Memorial Medical Center.

3. The investigator, Teri Holwerda, has my permission to send a questionnaire to my home address four months after my surgery.

4. I hereby authorize the investigator to release the information obtained in this study to scientific literature. I understand that I will not be identified by name.

5. I have been given Teri Holwerda's phone number so that I may contact her at any time if I have questions.

6. I may contact Teri Holwerda to receive a referral for assistance if I should experience anxiety or become emotionally upset because of my participation in this study.

I acknowledge that I have read and understand the above information, and that I agree to participate in this study.

Witness _____ Signature of Participant _____

Date _____ Date _____

____ I am interested in receiving a summary of the study results.

LIST OF REFERENCES

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- Altman, R. D. (1990). Osteoarthritis: Differentiation from rheumatoid arthritis, causes of pain, treatment. Post Graduate Medicine, 87(3), 67-78.
- Anderson, J. J., Firschein, H. E., & Meenan, R. F. (1989). Sensitivity of a health status measure to short term clinical changes in arthritis. Arthritis and Rheumatism, 32, 844-850.
- Barnfather, J. S., Price Swain, M. A., & Erickson, H. C. (1989). Evaluation of two assessment techniques for adaptation to stress. Nursing Science Quarterly, 2(4), 172-182.
- Benner, P. (1985). Quality of life: A phenomenological perspective on explanation, prediction, and understanding in nursing science. Advances in Nursing Science, 8(1), 1-14.
- Blalock, S. J., DeVellis, R. F., Brown, G. K., & Wallston, K. A. Validity of the center for epidemiological studies depression scale in arthritis populations. Arthritis and Rheumatism, 32, 991-997.
- Bradbury, V. L., & Catanzaro, M. L. (1989). The quality of life in a male population suffering from arthritis. Rehabilitation Nursing, 14(4), 187-190.
- Braden, C. J. (1990). A test of the Self-Help Model: Learned response to chronic illness experience. Nursing Research, 39(1), 42-47.
- Brown, J. H., Kazis, L. E., Spitz, P. W., Gertman, P., Fries, J. F., & Meenan, R. F. (1984). The dimensions of health outcomes: A cross-validated examination of health status measurement. American Journal of Public Health, 74(2), 159-161.
- Burckhardt, C. S. (1985). The impact of arthritis on quality of life. Nursing Research, 34(1), 11-16.

- Earle, J. R., Perricone, P. J., Maultsby, D. M., Perricone, N., Turner, R. A., & Davis, J. (1979). Psycho-social adjustment of rheumatoid arthritis patients from two alternative treatment settings. The Journal of Rheumatology, 6(1), 80-87.
- Fawcett, J., & Tulman, L. (1990). Building a programme of research from the Roy Adaptation Model of nursing. Journal of Advanced Nursing, 15, 720-725.
- Goeppinger, J., Thomas Doyle, M. A., Charlton, S. L., & Lorig, K. (1988). A nursing perspective on the assessment of function in persons with arthritis. Research in Nursing & Health, 11, 321-331.
- Hendricson, W. D., Russell, I. J., Prihoda, T. J., Jacobson, J. M., Rogan, A., Bishop, G. D., & Castillo, R. (1989). Development and initial validation of a dual-language English-Spanish format for the Arthritis Impact Measurement Scales. Arthritis and Rheumatism, 32, 1155-1159.
- Hill, J., Bird, H. A., Lawton, C. W., & Wright, V. (1990). The Arthritis Impact Measurement Scales: An anglicized version to assess the outcome of British patients with rheumatoid arthritis. British Journal of Rheumatology, 29(3), 193-196.
- Hoch, C. C. (1987). Assessing delivery of nursing care. Journal of Gerontological Nursing, 13(1), 10-17.
- Kazis, L. E., Meenan, R. F., & Anderson, J. J. (1988). Pain in the rheumatic diseases investigation of a key health status component. Arthritis and Rheumatism, 26, 1017-1022.
- Kelley, H. (1991). Patient perceptions of pain and disability after joint arthroplasty. Orthopaedic Nursing, 10(6), 43-50.
- Kozinn, S. C., & Wilson, P. D. (1987). Adult hip disease and total hip replacement. Clinical Symposia, 39(5), 2-32.
- Laborde, J. M., & Powers, M. J. (1980). Satisfaction with life for patients undergoing hemodialysis and patients suffering from osteoarthritis. Research in Nursing and Health, 3, 19-24.
- Laborde, J. M., & Powers, M. J. (1985). Life satisfaction, health control orientation and illness-related factors in persons with osteoarthritis. Research in Nursing and Health, 8, 183-190.

- Laupacis, A., Bourne, R., Rorabeck, C., Feeny, D., Wong, C., Tugwell, P., Leslie, K., & Bullas, R. (1993). The effect of elective total hip replacement on health-related quality of life. The Journal of Bone and Joint Surgery, 75-A(11), 1619-1626.
- Liang, M. H., Larson, M. G., Cullen, K. E., & Schwartz, J. A. (1985). Comparative measurement efficiency and sensitivity of five health status instruments for arthritis research. Arthritis and Rheumatism, 28, 542-547.
- Mason, J. H., Anderson, J. J., & Meenan, R. F. (1988). A model of health status for rheumatoid arthritis. Arthritis and Rheumatism, 31, 714-720.
- Mason, J. H., Weener, J. L., Gertman, P. M., & Meenan, R. F. (1983). Health status in chronic disease: A comparative study of rheumatoid arthritis. The Journal of Rheumatology, 10, 763-768.
- Meenan, R. F. (1982). The AIMS approach to health status measurement: Conceptual background and measurement properties. The Journal of Rheumatology, 9, 785-788.
- Meenan, R. F., Anderson, J. J., Kazis, L. E., Egger, M. J., Alts-Smith, M., Samuelson, C. O., Jr., Willkens, R. F., Solsky, M. A., Hayes, S. P., Block, K. L., Weinstein, A., Guttadauria, M., Kaplan, S. B., & Klippel, J. (1984). Outcome assessment in clinical trials: evidence for the sensitivity of a health status measure. Arthritis and Rheumatism, 27, 1344-1352.
- Meenan, R. F., Gertman, P. M., & Mason, J. H. (1980). Measuring health status in arthritis: The Arthritis Impact Measurement Scales. Arthritis and Rheumatism, 23, 146-152.
- Meenan, R. F., Gertman, P. M., Mason, J. H., & Dunaif, R. (1982). The Arthritis Impact Measurement Scales: Further investigations of a health status measure. Arthritis and Rheumatism, 25, 1048-1053.
- National Association of Orthopaedic Nurses. (1990). The impact of orthopaedic conditions on the health and economy of the United States. Pitman, N. J.: Author.
- O'Boyle, C., McGee, H., Hickey, A., O'Malley, K., & Joyce, C. (1992). Individual quality of life in patients undergoing hip replacement. Lancet, 339(8801), 1088-1091.
- Pearlman, R. A., & Uhlmann, R. F. (1988). Quality of life in chronic diseases: Perceptions of elderly patients. Journal of Gerontology, 43(2), 25-30.

- Pincus, T., Summey, J. A., Soraci, S. A., Jr., Wallston, K. A., & Hummon, N. P. (1983). Assessment of patient satisfaction in activities of daily living using a modified Stanford Health Assessment Questionnaire. Arthritis and Rheumatism, 26, 1346-1353.
- Potts, M. K., & Brandt, K. D. (1987). Evidence of the validity of the Arthritis Impact Measurement Scales. Arthritis and Rheumatism, 30, 93-96.
- Rorabeck, C., Bourne, R., Laupacis, A., Feeny, D., Wong, C., Tugwell, P., Leslie, K., & Bullas, R. (1994). A Double-Blind Study of 250 Cases Comparing Cemented With Cementless Total Hip Arthroplasty. Clinical Orthopaedics and Related Research. (298), 156-164.
- Roush, S. E. (1985). Patient-perceived functional outcomes associated with elective hip and knee arthroplasties. Physical Therapy, 65, 1496-1500.
- Roy, C. (1988). An explication of the philosophical assumptions of the Roy Adaptation Model. Nursing Science Quarterly, 1(1), 26-34.
- Roy, C. (1984). Introduction to nursing an adaptation model (2nd ed.). Englewood Cliffs: Prentice-Hall, Inc.
- Roy, C. & Andrews, H. (1991). The Roy adaptation model: The definitive statement. Norwalk, Connecticut: Appleton & Lange.
- Schumacher, H. R., Jr. (Ed.). Primer on the rheumatic diseases (9th ed.). Atlanta: Arthritis Foundation.
- Selman, S. W. (1989). The impact of total hip replacement on quality of life. Orthopaedic Nursing, 8(5), 43-49.
- Smith, M. C. (1988). Roy's Adaptation Model in practice. Nursing Science Quarterly, 1(3), 97-98.
- Stewart, A. L., Greenfield, S., Hays, R. D., Wells, K., Rogers, W. H., Berry, S. D., McGlynn, E. A., & Ware, J. E., Jr. (1989). Functional status and well-being of patients with chronic conditions. Journal of the American Medical Association, 262, 907-913.
- Taal, E., Jacobs, J. W., Seydel, E. R., Wiegman, O., & Rasker, J. J. (1989). Evaluation of the Dutch Arthritis Impact Measurement Scales in patients with rheumatoid arthritis. British Journal of Rheumatology, 28, 487-491.

Wiklund, I., & Romanus, B. (1991). A comparison of quality of life before and after arthroplasty in patients who had arthrosis of the hip joint. The Journal of Bone and Joint Surgery, 73-A(5), 765-769.