Physical Function and Physical Activity in Obese Adults After Total Knee Arthroplasty

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KEYWORDS

• Physical function • TKA • Obesity • Physical activity • Quality of life

KEY POINTS

- Obese patients are more likely to have osteoarthritis and total knee arthroplasty (TKA). This investigation sought to evaluate physical function, activity level, and quality of life (QOL) in obese TKA patients.
- Obese adults who had TKA and were near 1-year postsurgical follow-up appointment were recruited. Evaluation included QOL and activity questionnaire, medical histories, anthropometrics, strength, and aerobic capacity.
- Obese TKA patients have physical performance limitations and low physical activity levels 1 year after surgery and completion of postoperative rehabilitation.

INTRODUCTION

Obesity is associated with several health-related conditions detrimental to general health and, specifically, the musculoskeletal system.[1,2] Excess body weight directly and indirectly stresses the joints, particularly the knees, which increases the deterioration of the protective soft tissues in the joint structures.[3,4] Thus, obesity is a strong risk factor for development of osteoarthritis (OA)[5,6] and obese individuals have a substantially higher rate of total knee arthroplasty (TKA) than healthy weight individuals.[7,8]

Although the associations between obesity and OA and obesity and incidence of TKA are reasonably well described, the effects of obesity on TKA rehabilitation and long-term functional recovery are not sufficiently understood. All patients, regardless of body weight, seem to experience decreased pain and improved function following TKA.[9] However, there is some

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evidence indicating worse long-term outcomes among obese patients. For example, morbidly obese patients are more than 5 times more likely than healthy weight patients to experience complications and device failure within 5 years of TKA.[10,11] Obese individuals, accordingly, have higher reported need for additional surgical revision to adjust or repair the TKA and, although functional abilities improve following TKA, outcomes are significantly poorer when compared with healthy weight patients.[12] Functional abilities, such as completion of activities of daily living and exercise capacity, and factors that influence functional capacity, including persistent pain, muscle weakness, and balance impairments, are not well researched after completion of initial rehabilitation programs. Thus, the long-term benefit of the TKA intervention among obese adults requires further consideration.

The purpose of this investigation was to evaluate baseline physical function, physical activity levels, and quality of life in obese patients 1 year following TKA as part of an individually tailored exercise intervention designed to improve physical function among obese adults.

MATERIALS AND METHODS

Participants

Sixty obese (body mass index [BMI] >30 kg/m^2) patients who were 10 to 18 months post-TKA volunteered to complete surveys, a functional assessment, and 16 weeks of home-based exercise. Patients were required to have medical clearance to participate in exercise testing and intervention. Patients were identified and recruited from surgical follow-up clinics at an orthopedic clinic based at a large health science center. Before consent, each participant was prescreened for eligibility by phone by a research nurse (Fig. 1). As approved by Institutional Review Boards for Human Subjects Research at the University of Tennessee Health Science Center and the University of Memphis, participants were informed of all procedures, potential risks, and benefits associated with the study, and written informed consent was obtained for each participant. Final eligibility was verified through health and medical history and a physical activity survey at the initial clinic visit.

Measurements

Anthropometrics

Height and weight were collected without shoes using a calibrated digital clinic scale and a wall-mounted stadiometer. Body composition was measured using standardized skinfold measures developed by Jackson and Pollock[13] and described in detail by the American College of Sports Medicine (ACSM).[14] Skinfolds were measured with a Lange skinfold caliper (Beta Technology, Santa Cruz, CA, USA) at the chest, abdomen, and thigh in men; and triceps, suprailiac crest, and thigh in women. Sum of skinfolds measured were used to calculate percentage

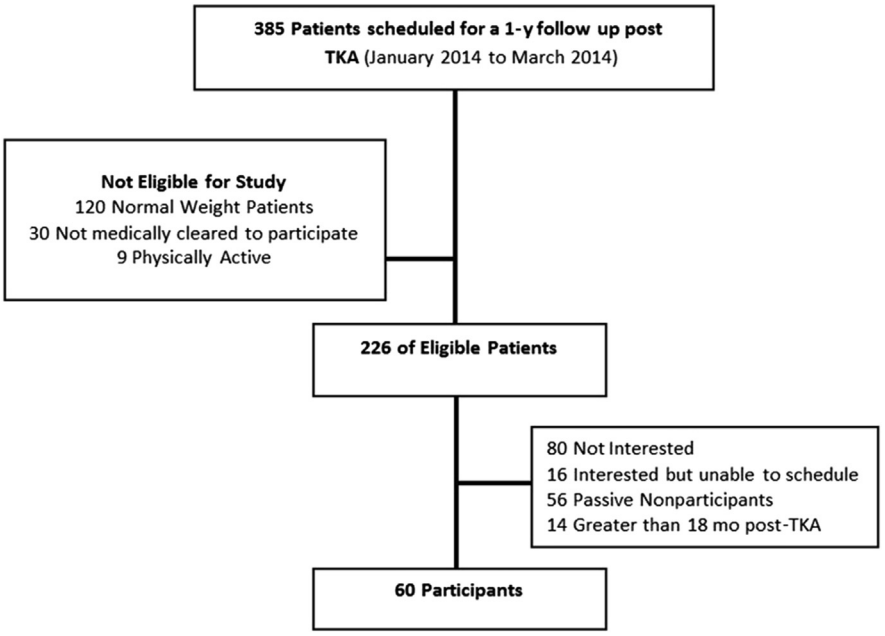

Fig. 1. Consort diagram.