

STEP COUNT IN PEOPLE WITH PATELLOFEMORAL OSTEOARTHRITIS DURING FREE-LIVING, AND THE ASSOCIATION WITH QUALITY OF LIFE

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Purpose: Walking is the most popular form of physical activity in adults. However, knee osteoarthritis (OA) is a strong contributor to difficulty with walking. Daily step count is a viable metric for quantifying physical activity and has been reported in individuals with knee OA in free-living conditions. Patellofemoral (PF) OA is an important and common subgroup of knee OA and is evident in half of the people with knee pain and radiographic OA. However, little is known about physical activity in people with PF OA. This study aimed to describe step count in people with PF OA during free-living and to explore the association between step count and health- and knee-related quality of life.

Methods: Individuals with PF OA were recruited (aged ≥ 50 years; predominant symptom of anterior or retro-patellar knee pain aggravated by least two PF joint loading activities; pain present during these activities on most days of the previous month; pain severity ≥ 3 on an 11-point numerical rating scale during aggravating activities; duration of symptoms ≥ 3 months; and either no morning joint stiffness or morning stiffness lasting no longer than 30 minutes). Participants completed the Knee injury and Osteoarthritis Outcome Score (KOOS) and the Short-Form 12 Questionnaires. Health-related quality of life was assessed using the Physical and Mental Component Summary dimensions of the Short-Form 12, and knee-related quality of life was assessed using the quality of life subscale of KOOS. Step count data were collected with wireless, wrist-worn tri-axial accelerometers (Fitbit Flex™, Fitbit Inc., San Francisco, CA). Participants were asked to wear their Fitbit™ daily during waking hours (removing for water-based activities), and sync the device at least every three days during the study period of 90 days. We downloaded step count data from each participant's Fitbit™ using the product interface (www.fitbit.com). For each day of the 90-day period, a minimum of 1500 steps was needed to be recorded by the device for that day to be considered a valid day. Average daily step count was presented as mean (\pm SD). Participants were classified as physically inactive (5000-7499 steps/day), moderately active (7500-9999 steps/day), physical active ($\geq 10,000$ steps/day), and very active ($\geq 12,500$ steps/day) (Tudor-Locke & Basset, *Sports Med*, 2004). The associations between step count and health- and knee-related quality of life were evaluated with Pearson correlation coefficients (r).

Results: Thirty-two participants with PF OA were included (Table 1). Participants reported moderate to severe knee-related symptoms, with the greatest limitations reported on the pain and function in activities of daily living subscales of KOOS. The mean (\pm SD) daily step count was 9660 ± 3455 (range 5148 to 17380), and the average number of valid days was 87 ± 6 (range, 67 to 90). 34% of participants were classified as physically inactive, 25% were moderately active, 22% were physical active, and 19% were very active. Daily step count was associated with the Physical Component Summary score ($r = -0.336$, $p = 0.049$), but not the Mental Component Summary score ($r = 0.276$, $p = 0.109$) or KOOS-quality of life subscale ($r = -0.048$, $p = 0.785$).

Conclusions: Individuals with PF OA walked on average 9660 steps/day. Greater daily step count was weakly associated with physical aspects of health-related quality of life,

but not mental components of the SF-12 or knee-related quality of life. The average daily step count in our PF OA cohort was higher than that reported in older individuals with knee OA (~7000 steps/day). This may reflect differences in typically aggravating activities between PF OA and knee OA, as individuals with PF OA typically have less severe limitations with walking. Although average step counts in our PF OA participants aligned with physical activity guidelines, our findings also indicate that ~60% of our cohort did not regularly meet daily step count targets. Health professionals should consider that patients with PF OA may not be meeting daily recommended amounts of physical activity, and incorporate treatment strategies to facilitate physical activity in this population.

Table 1: Baseline demographics and clinical characteristics (n=32)	
Demographics	
Age, years	59±6
Body mass index, kg/m ²	29±6
Sex female, n (%)	24 (75)
Knee injury and Osteoarthritis Outcome Score (0-100 score, 100= greater limitations)	
Pain	39±17
Symptoms	41±20
Activities of daily living	34±22
Sports and recreation	45±24
Quality of life	44±24
Short-Form 12 Questionnaire (0-100 score, 100=higher quality of life)	
Physical component summary	42±9
Mental component summary	53±10