

Mobility Apprehension in Amputees

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Introduction

- The prevalence of limb loss in the United States is estimated at 1.9 million instances with approximately 185,000 amputations occurring annually [1].
- Studies report that after lower-limb amputation, patients have high levels of pain, leading to restrictions in functional activity, and therefore are at risk for developing avoidance behaviors [2, 3].
- A theoretical model (Figure 1) was developed based on the factors related to high fall risk among lower-limb amputees [4, 5].
- Potential contributing factors include muscle weakness that leads to balance and gait abnormalities, which subsequently perpetuates low mobility and mobility apprehension [4].

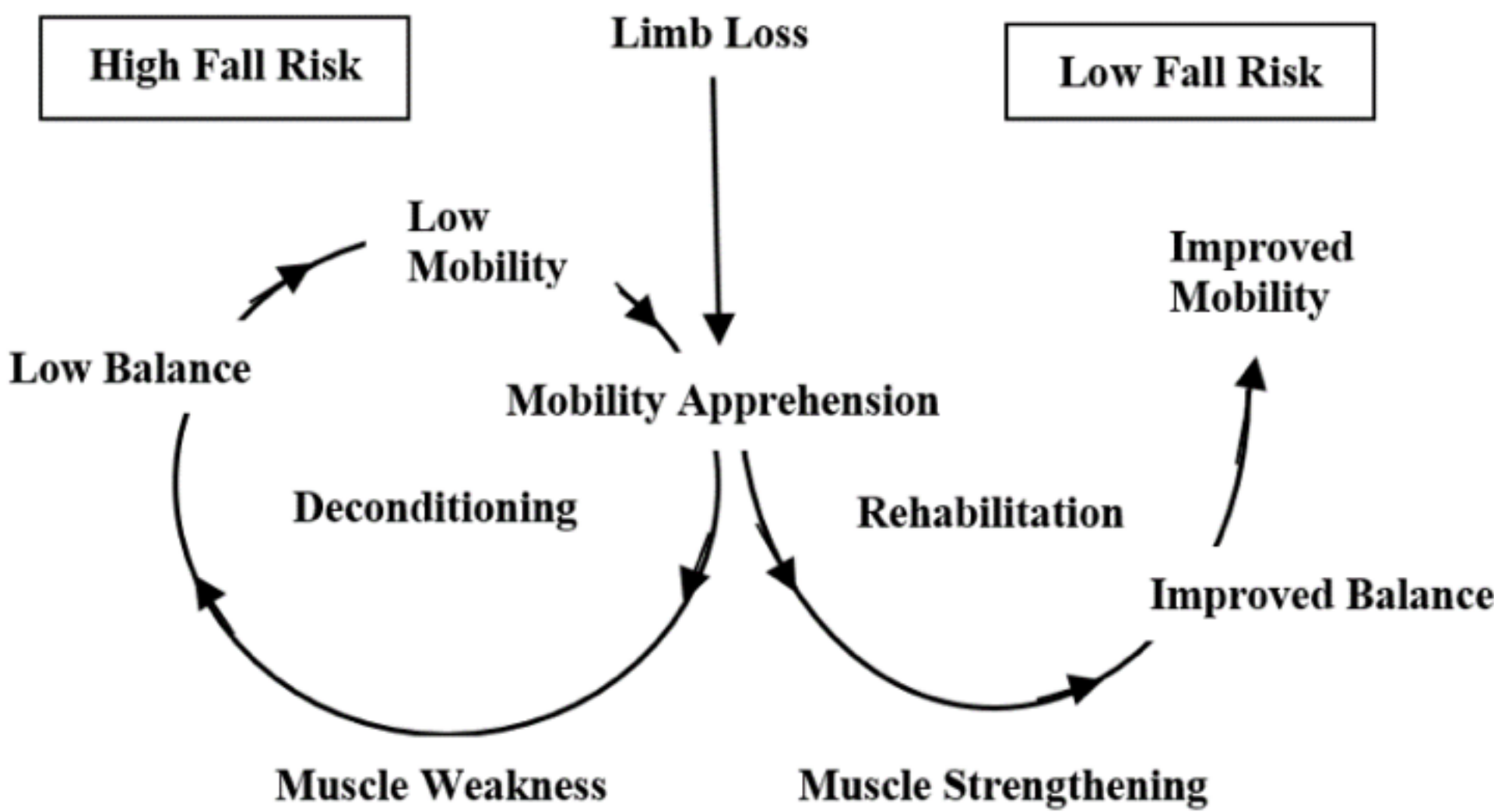


Figure 1. Amputee Mobility Model

Purpose

The aim of the study was to determine factors associated with mobility apprehension in individuals who underwent surgery for amputation of a lower-limb.

Methods

- Participant inclusion criteria included 1) at least 18 years of age; 2) participants had a well-fitting prosthesis; and 3) participants had the ability to ambulate at least 10 feet. Characteristics provided in Table 1.
- Participants completed questionnaires regarding demographic information and self-report instruments measuring mobility apprehension.
- Balance was measured using the Berg Balance Scale.
- Hip (average of left and right hip extensors) and core (average of back and abdominals) strength was measured using a handheld dynamometer (JTech Commander PowerTrack II).
- A description of the tests and questionnaire are under “Study Instruments”.
- Linear regressions were used to analyze data (alpha = .10).

Acknowledgements

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Study Instruments

- **Tampa Scale for Kinesiophobia (TSK):** Mobility apprehension was measured with the 17-item TSK with total scores ranging from 17-68.
- **Berg Balance Scale:** The 14 item scale consist of sitting to standing, standing with eyes closed, and turning 360 degrees and has been shown to be a reliable measure of balance in persons with lower limb amputation [6].
- **Hip and Core Strength:** The handheld dynamometer is a reliable strength measure for persons with disabilities. The measurements are considered similar to isometric manual muscle tests, except the dynamometer was used to quantify the forces produced by the subject [7].

Table 1. Participant Characteristics

Characteristic (n = 20)	n (%)
Mean Age in Years (SD)	55.7 (10.1)
Sex	
Female	6.0 (30.0)
Male	14.0 (70.0)
Mean Years Since Surgery (SD)	9.6 (11.9)
Other Illnesses	
≥ 1	16.0 (80.0)
None	4.0 (20.0)
Incidence of Falls in Past Year	
Yes	13.0 (65.0)
No	7.0 (35.0)
Reason for Surgery	
Blood Clot	3.0 (15.0)
Infection	10.0 (50.0)
Trauma	2.0 (10.0)
Other	5.0 (25.0)
Mean Core Strength in lbs (SD)	5.6 (3.2)
Mean Hip Strength in lbs (SD)	15.8 (9.3)

Results

- Of the participants, 65% reported a fall in the past year.
- The mean TSK score was 38.65 (6.68).
- The mean Berg Balance score was 46.25 (6.74).
- Linear regression analysis showed core and hip strength were independently related to balance ($r = .39$, $p = .085$; $r = .451$; $p = .046$; respectively).

Conclusion

- Results may assist clinicians in aiming rehabilitation programs towards increasing hip and core strength after surgery, and thus increasing balance and leading towards better mobility for individuals with a lower limb amputation.
- It may also introduce post-physical therapy exercise interventions to target potential muscle weakness to improve balance and mobility.