

## COMPARISON OF FREQUENCY AND CIRCUMSTANCES OF FALLS AMONG MALE AND FEMALE TRANSFEMORAL PROSTHESIS USERS

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<b>Article Info</b>	Abstract
<b>Article History:</b> <b>Submitted:</b> 05-07-2022 <b>Revised:</b> 09-07-2022 <b>Accepted:</b> 10-07-2022	Incidence of amputation rises sharply with age. Most of the amputation occur above the age of 65. Lower limb amputation has a significant impact on the functional ability of the patients. The phenomenon of falls is globally recognized as the most common problem identified by health care workers. The study design is a cross sectional survey to compare the frequency and circumstances of falls among male and female Transfemoral prosthetic patients. Out of the 90 patient's frequency of fall in ages group 1 (15-30) is n=20, age group 2 (31-45) is n=25, age group 3 (45-60) is n=31 and ages group 4 (60+) were n=14. Also the fall frequency is higher in male patients than female. N=14 reported falls on slippery surface while n=31 reported falls on non-slippery surfaces. Out of 90 patients with Trans femoral prosthesis user n=30 falls because of mobility system failure, n=39 falls because of impaired balance and n=1 falls because of sensory impairment. The results of this study suggest that fall is quite prevalent among ambulatory Transfemoral prosthetic patients and should be prioritized to evaluate the circumstances surrounding the fall so that to reduce the future risk of fall.
<b>Keywords:</b> Trans femoral, Fall Frequency, circumstances, amputees.	
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## Introduction

The occurrence of amputation of in western world and Asia is mainly connected with ageing factors majority of amputation took place at the age of 65 years or above. Lower limb extremity amputation occurred due to trauma, due to complication of disease progression. (Steinberg et al., 2019). For saving of life or it may be congenital in etiology. Lower limb amputation has adverse effect on individual quality of life as showed 26%-62% of patients with lower limb prosthesis users who recovered to ambulate outdoor. (Singh et al., 2009) After amputation patients are facing a variety of challenges i.e stress, depression, anxiety are commonly observed. Falling with prosthesis is a major problem worldwide identified by the health care workers. Definition of fall is "Sudden, not intentional, and unexpected movement from orthostatic position, from seat to position, or from clinical position". There are high chances of fall of geriatric patients of age 65 or above. The literature showed that 30% of Elderly people fall at least once in a year whereas the it is much more high up to 50% in people having age more than 80 years. (Strini et al., 2021)

After amputation in initial days the patients used to fall while getting up from couch or wheelchair as they think that their amputated leg is still in place and overlooked that his leg is amputated. (Tesio et al., 1998) Most of the time these patients putting more weight on healthy limb as compare to the prosthetic limb in order to attain stability. This uneven weight distribution can lead to various kinds of deviations in such patients and subsequently increase energy expenditure and poor balance in the patients which enhanced the tendency of falling. (Vanicek et al., 2009)

Falls and apprehension about falling are huge health conditions that are important for health care workers & Health experts since they might show a decrease in work that is possibly adjustable. (Stevens et al., 2006, 2006)

A greater part of studies conducted on falls are mostly dedicated for non-disabled geriatric population which is not unforeseen. In USA 1 out of 3 elderly people are facing fall problem annually.

Nevertheless, this issue is not only associated with aging population. For instance, moderately aged

grown-ups have been accounted for to fall at rates practically identical to, if not more prominent than, 33%. Falls address an especially significant issue for individuals with amputation.

According to the study (Rosenblatt et al., 2014) that there is a high chances of fall of patients with lower limb amputee than non-amputee and the percentage of such patients are more than fifty percent annually. It is also noted that there is a high chance of phobia of falling in such amputees which leads to future incidence of falling in these amputees

Most of the researches mentioned the risk and fear of fall in elderly patient whereas this study aim is to find out the comparison of fall frequency of male and female and the cause of fall. (Stevens et al., 2006)

## Methods

This was a cross-sectional study design. This study was done at Pakistan Institute of Prosthetic and Orthotic Sciences Peshawar. Study population were male and female Transfemoral Prosthetic users who were registered at PRSP Peshawar and checkout 2 year ago.

The duration of this study was six months (May to November 2021). The sample size were 90 Trans femoral prosthesis users. Non-probability Convenience sampling technique was used. Inclusion criteria included unilateral lower limb amputees and aged between 16 to 65 year. Exclusion Criteria HAD, very short stump amputee and other deformity or weakness on sound side. The data was collected through a standard questionnaire. Analysis of Data was done through SPSS version 22.

## Results

The total of 90 participants took part in this study out of 90 there were 45 males and 45 females.

	Frequency	Percentage
Male	45	50
Female	45	50

**Table 1: gender of the patients**

### Age of patient with recent fall:

Age of patient	Non in last 12 months	one or more between 3 and	one or more in last	One or more in last three months whilst in	Total

		12 months ago	3 months	patient/resident	
15-30 years	9	11	0	0	20
31-45 years	11	11	3	0	25
46-60 years	11	17	1	2	31
60+	1	6	7	0	14

#### Gender and recent fall:

Comparison between Gender and Recent fall (FRAT) was carried out to find the frequency of recent fall in both gender. Out of 90 patients with Trans femoral prosthesis user n=25 reported fall one or more time between 3 and 12 months ago. Fall ratio is higher in male as compare to female. Detail frequency are shown in table.

Gender	Non in last 12 months	one or more between 3 and 12 months	One or more in last 3 months	One or more in last three months whilst in patient/resident	
Male	12	25	7	1	45
Female	20	20	4	1	45

#### Socket comfort and recent fall:

Comparison between socket comfort scale and Recent fall (FRAT) was carried out to find the frequency of recent fall with comparison to socket comfort. Out of 90 patients with Trans femoral prosthesis user n=11 reported fall more time with socket comfort 8/10. Detail frequency are shown in Table.

Socket comfort	Non in last 12 months	one or more between 3 and 12 months ago	one or more in last 3 months	One or more in last three months whilst in patient/resident	Total
5	3	3	0	0	6
6	2	4	2	0	8
7	7	10	2	1	20
8	8	11	2	0	21
9	4	9	5	1	19
10	8	8	0	0	16

#### Comparison between extrinsic fall factors and recent fall:

Comparison between Extrinsic Fall Factors and Recent fall (FRAT) was carried out to find the frequency of recent fall with comparison Extrinsic Fall Factors. Out of 90 patients with Trans femoral prosthesis user n=14 reported fall one or more time between 3 and 12 months ago on slippery surface and n=31 falls one or more time between 3 and 12 months ago on non- slippery surface. Detail frequency are shown in Table.

Extrinsic fall factors	Non in last 12 months	one or more between 3 and 12 months ago	one or more in last 3 months	One or more in last three months whilst in patient/resident	Total
Slippery surface	10	15	4	0	29
Non slippery surfaces	22	30	7	2	61

#### Comparison between intrinsic fall factors and recent fall:

Comparison between intrinsic Fall Factors and Recent fall (FRAT) was carried out to find the frequency of recent fall with comparison intrinsic Fall Factors. Out of 90 patients with Trans femoral prosthesis user n=30 falls because of mobility system failure, n=39 falls because of impaired balance, n=1 falls because of sensory and n=20 falls because loss of consciousness on slippery surface and n=61 falls on non- slippery surface. Detail frequency are shown in Table.

Intrinsic fall factors	Non in last 12 months	one or more between 3 and 12 months ago	one or more in last 3 months	One or more in last three months whilst in patient/resident	Total
Mobility systems failure	8	19	3	0	30
Impaired balance	16	18	4	1	39
Sensory impairment	1	0	0	0	1
Loss of consciousness	7	8	4	1	20

## Discussion

### Comparison between age and fall:

According to current study (Kahle et al., 2016) the cross tabulation shows the age group 3 (46-60 years) n=17 reported falls one or more times between 3 and 12 month ago and age group 4 (60+ years) n=7 reported fall one or more times in last 3 months while n=6 one or more times between 3 and 12. Also patients experienced highest number of falls between 3 and 12 months duration which is 50 % (n=45).

### Comparison between gender and fall:

The comparison between Gender and Recent fall (FRAT) in both gender. Out of 90 patients with Trans femoral prosthesis user n=25 reported fall one or more time between 3 and 12 months ago. Fall ratio is higher in male as compare to female. The study shows that male has experienced 36.66% more falls in the last one-year duration as compared to female patients who experienced 27.77% of falls. Also the number of female patients to not have any falls in the last 12 months is 20 as compared to male patients which is 12. It shows a higher number of females have not experienced any fall in the 12 months duration as compared to males.

This study clearly shows that fall is quite prevalent in the lower amputee population and the fall clearly increases with age and is more common in male patients.

### Comparison between socket comfort and fall:

The comparison between socket comfort scale and Recent fall (FRAT) shows frequency of recent fall with relation to Transfemoral socket comfort n=11 falls one or more times between 3 and 12 with socket comfort score 8 and n=5 fall one or more times in last 3 months with socket comfort score 9. According to current study that the fall frequency has no relation with socket comfort. The socket fitting is very important in lower limb prosthesis and it will be improved the comfort, stability and functionality of lower limb amputee. ill fitted socket can cause damage to the skin, leading to the improper fitting of prosthesis and needs lots of adjustment in the socket and most of the time full replacement of prosthesis. Well fitted socket can save time, money and facilitate amputee to perform their daily activities without any hurdle

### Comparison between extrinsic factors and fall:

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Comparison of recent fall (FRAT) to Extrinsic Fall Factors n=30 falls one or more time between 3 and 12 months ago on non-slippery surface. According to this study the number of falls is higher on non-slippery surface n=61 than on slippery surface n=29.

### Comparison between intrinsic factors and fall:

Comparison between intrinsic Fall Factors and Recent fall (FRAT) n=19 falls one or more times between 3 and 12 months ago due to mobility failure and n=18 falls one or more times between 3 and 12 months ago due impaired balance. This study shows n=39 patients fall because of impaired balance and n=30 fall because of mobility failure.

## Conclusion and Recommendation

This research concluded that fall is quite prevalent among ambulatory Transfemoral prosthetic patients and should be prioritized to evaluate the circumstances surrounding the fall so that to reduce the future risk of fall. This study also suggest that fall is higher in male population and the number of falls increases with age so in future special care should be given to older patients and should be guided on how to avoid the future risk of fall. So this study concluded that there is considerable prevalence of fall in Transfemoral prosthetic user. (Hausdorff et al., 2001; Stevens et al., 2006).

It is important to identify the causes of fall of patients with lower limb amputees in order to improve the quality of life of such patients and avoid negative effect and reduced the cost.(Hausdorff et al., 2001).

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