



One Step at a Time

An Analysis of Patient Use and Disuse of their Lower Limb Prosthesis

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01. Introduction

Limb loss can occur due to disease, congenital factors, or traumatic injury; however, everyone who experiences limb loss is not guaranteed a prosthesis in the years following recovery. Despite having made many breakthroughs in the world of prosthetics and orthotics, unique cases and special exceptions to full recoveries are increasing in number each year. Some patients also opt out of using a prosthesis because of possible challenges with manufacturing or using a prosthesis, pain and discomfort while wearing a prosthesis, lack of training, improper fit, limited or no access to prosthetists, and lack of insurance or finances [1]. As determined by the CGS Administrators, LLC policy for Local Coverage Determination of Lower Limb Prostheses, a lower limb prosthesis is covered by insurance when the beneficiary reaches or maintains a defined functional state and is deemed as motivated to ambulate by their prosthetist [3]. A patient's functional abilities are further taken into account when the patient seeks additions or modifications to their prosthesis which can be verified by the prosthetist or treating physician while analyzing the patient's medical history, the condition of the residual limb, and their desire to ambulate. In this study, a quantitative and qualitative analysis of amputees' prosthetic usage will be used to investigate the reasons why amputees are reluctant to use their prosthetics and determine whether there is a strong correlation to one's activity level. It is hypothesized that the demographic most at risk for prosthetic disuse would be those who were previously less mobile and/ or those who have a higher health risk. On the other hand, I would assume that the activity level post-amputation would have to be quite high, such as being very active and relatively healthy. This assumption proves concurrent with the information found during extensive preliminary research based on the physician's likelihood of referring amputees for a prosthesis.

02. Objective

The objective of this study is to determine what factors cause patient disuse of their prosthesis or what factors interfere with a patient's ability to rehabilitate back into normal life, more specifically in the Houston area.

03. Methodology

This study will require a three-part analysis of varying perspectives from prosthetists and prosthesis users who have experience with or have received lower limb prostheses:

- Research (On Patient Perspective)
- Interview (with Mr. Eric Setzer)
- Survey (UPI Technicians & Prosthetists)

Though plenty of research has already been conducted surrounding the use of a prosthetic limb, venturing deeper into multiple scholarly journals can help provide possible factors that explain the decline in usage of patients' lower limb prostheses. For the survey, prosthetists will be asked a variety of questions to gain a comprehensive view of their patient's prosthetic usage. Furthermore, an interview with the staff from Unlimited Prosthetics would offer a detailed professional perspective on the major issues regarding why patients are less inclined to use their lower limb prostheses for mobility.

04. Results

User-relevant factors influencing the prosthesis use of persons with a transfemoral amputation or knee-disarticulation: A meta-synthesis of qualitative literature and focus group results | PLOS One



Figure 1: From PLOS One [2]

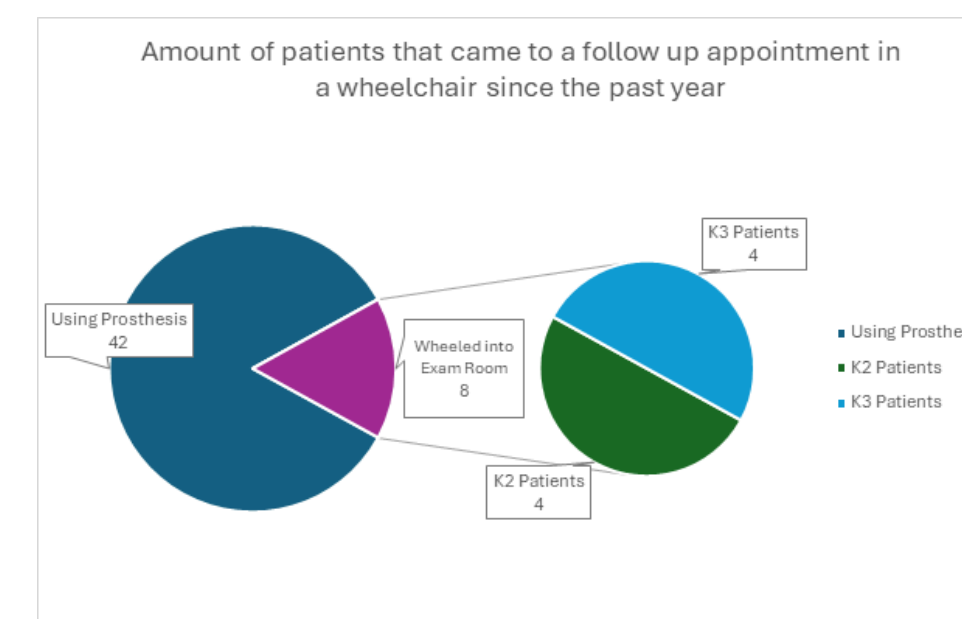


Figure 2



Interview Transcript Quotes from Eric Setzer

What causes the use of a prosthesis? *"They want to be able to walk and have their lifestyle back."*

What causes the disuse of a prosthesis? *"Some people that need help, there are some people, I guess, that are afraid, and there are some people who have gotten a prosthesis, and it was harder than they expected it to be because of their condition ..."*

"We make the prosthesis, it's a tool for them, a resource for them."

"motivation drive and reality of what it actually takes"

What is being done to improve your patient's use of their prostheses? *"I've tried to educate my patients as to how to take care of themselves, how to take care of their prosthesis.."*

The prosthesis fits but our bodies constantly change and with more activity, the pressure from contact atrophy is eventually going to shrink your limb and you're going to need a new one down the road.

"I try to help them self-diagnose where they are in the prosthesis to try and ward off any issues down the road."

Additional Comments *"You're going to see more transfemoral or above the knee patients are going to rely more on the wheelchair than you're going to see with a transtibial or BK prosthesis..."*

"You can't cookie cutter and box people into certain categories because there's so many variables and every human being is different..."

Would you say how long they've had their prosthesis affect their use of it? *"Definitely ... when you grow up as a child with a prosthesis most people who are congenital abnormalities or early on amputations...people like that have so much more experience, and they adapt, and when they come in you can't even tell the have a prosthesis."*

Figure 6

05. Findings

With prosthetists at Unlimited Prosthetics Inc. approximating how nearly 8/50 patients this past year were using a wheelchair during follow-up appointments, it suggests that patient disuse of their prosthesis is a relevant issue among prosthetic wearers [Figure 2]. Overall, the common factor that can be used to determine patient use of their prosthesis is their level of motivation. The analysis of the patient's perspective on this matter validates how the activity level, self-confidence, desire for independence, and support are quite relevant factors [Figure 1]. This is further supported by Figure 3 with the majority of prosthetists working at UPI believing that activity level and motivation are the major determinants of a patient's prosthesis use [Figure 3]. Contrary to Figure 3's results, a decrease in activity level plays a less significant role in the disuse of a prosthesis as determined by UPI prosthetists [Figure 3, 4]. As supported by Eric Setzer, these findings can be attributed to how patients may be less motivated to return to normal ambulation or become discouraged due to the rehabilitation not being as easy as expected [Figure 3,4,6]. The prosthetists suggest that education, precise measurements, and ensuring patient health and well-being are implemented throughout the rehabilitation process to ensure that the patient continues to employ their prostheses in the long run which is consistent with what was mentioned by Eric Setzer [Figure 5,6].

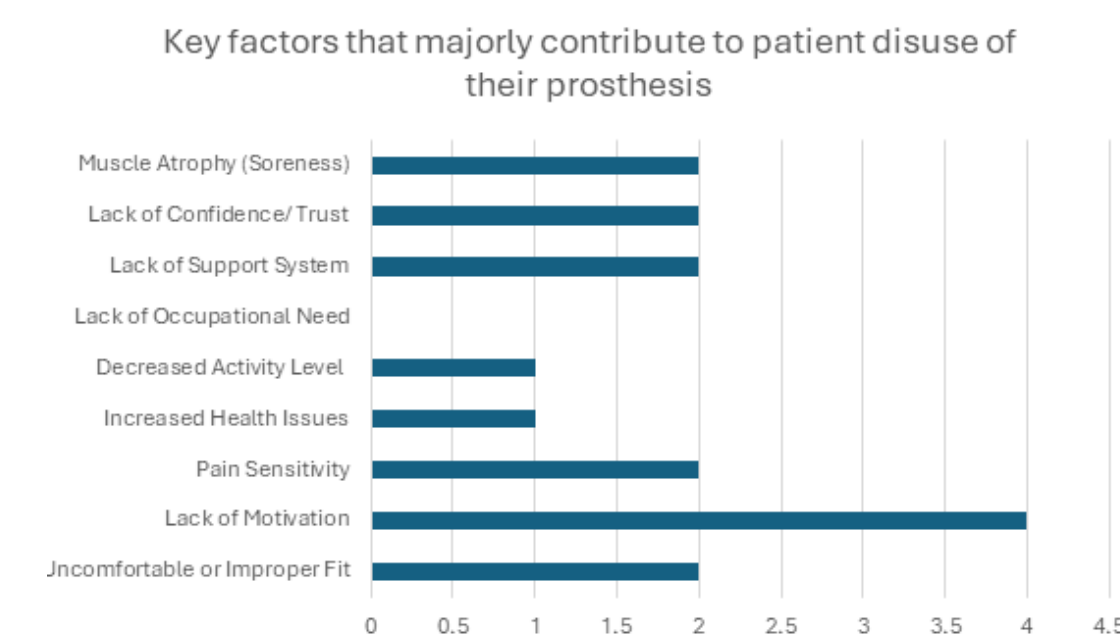


Figure 3

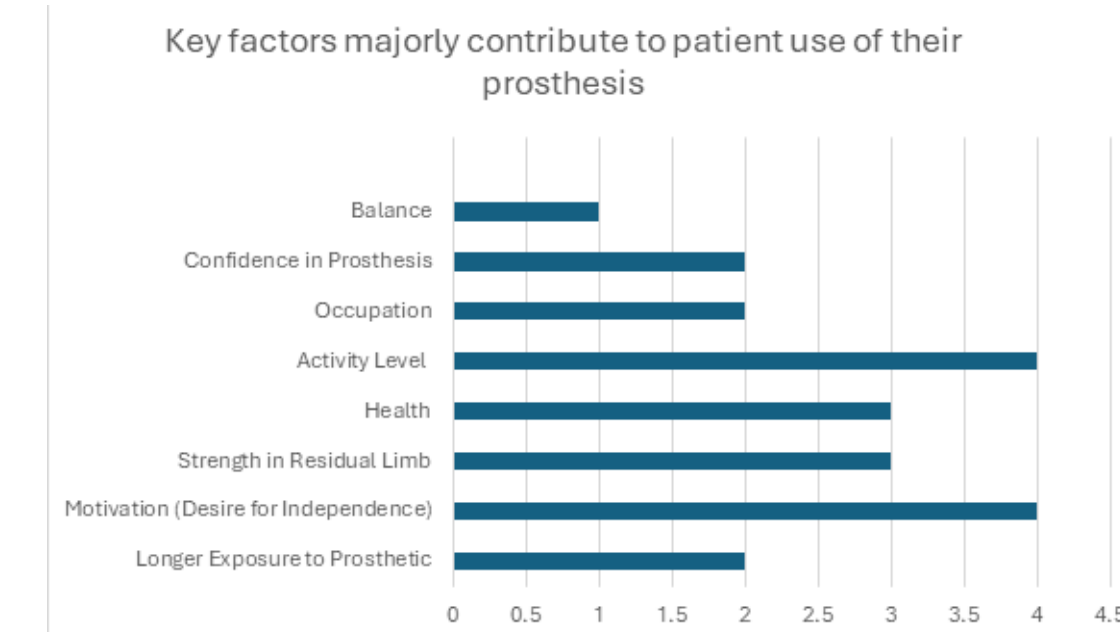


Figure 4

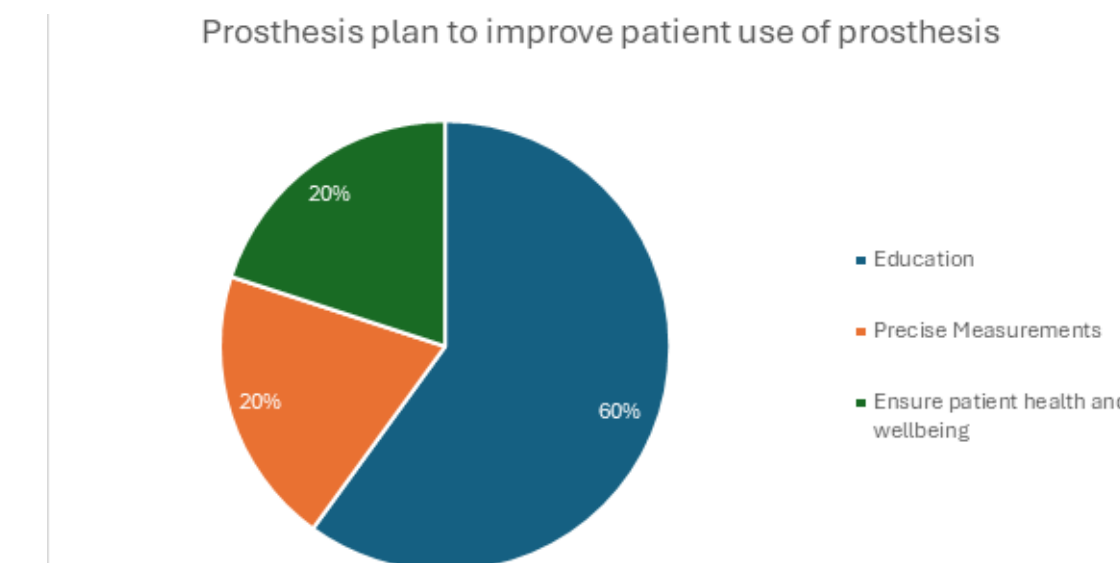


Figure 5



06. Conclusion

The limited pool of participants in the survey causes a discrepancy in the results meaning that this study is more targeted toward lower limb amputees who attend Unlimited Prosthetics. An additional note that was taken into consideration that some prosthesis wearers find it more convenient to use a wheelchair. Conclusively, the result of this study describes how activity level plays an important role however considering other factors, it holds equal weight. Thus, the overall factor that all facets of this study pointed to be the importance of motivation and desire for independence.

