How training/therapy, and education may impact satisfaction of veterans with

service-connected disabilities who require prosthetic devices: evaluating overall satisfaction of veterans with their prostheses, as well as the rehabilitation and prosthetic services provided by

the Veteran’s Administration.

Submitted by

J. Scott Copley

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Dr. Helga Stokes, Professor

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**Abstract**

The purpose of this study is to investigate how veterans with service-connected disabilities who have been fitted with prosthetic devices use their devices, and whether or not the level of training (includes physical therapy training) they received has an impact on their satisfaction with the devices and the services of the Veteran’s Administration’s Rehabilitation and Prosthetic Services Department. For the sake of scope, this study will center upon the Pittsburgh VA Medical Center as well as regional Pittsburgh VA clinics where rehabilitation and prosthetic services exist. Results from this study will be provided to the Veteran’s Administration, along with recommendations for how services and training may be adapted, based upon what is learned in the study.

Keywords: training, physical therapy, education, prosthetic devices, rehabilitation

**Introduction**

According to the United States Bureau of Labor Statistics, as of August 2020, 4.7 million veterans had a service-connected disability, which included not only amputation, but loss or reduction of hearing or sight, mental disabilities, and more. For this proposal, the focus will remain on those with injuries or disease-states requiring a major limb amputation who reside in the Pittsburgh area. A major limb amputation is defined as one that results in the loss of at least the wrist or ankle. Webster, et al., (2019) notes that there has been an increase of 34% of veterans with limb loss receiving care in the Veteran’s Administration from 2009 to 2019. Of the approximately 149,000 (figure 1) veterans living in the seven-county Pittsburgh Metropolitan Statistical Area, the Census Bureau estimates around 24,118 are living with a service-connected disability. Approximately 6,617 of those veterans have a disability rating which would require a prosthesis (University of Pittsburgh, Veterans Population Update, 2019).

*Figure 1: Number of veterans residing in the Pittsburgh Metropolitan Service Area*

*(MSA) by period of service.*

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*Source:* University of Pittsburgh Center for Social and Urban Research (2019).

The purpose of this study will be to learn in what ways some veterans in the Pittsburgh MSA are dissatisfied with their prosthetic devices. Is there a difference in satisfaction between devices built directly by the VA and devices built by third-party vendors? Was training made available to them, and did they avail themselves of the opportunity? What is their personal circumstance and how may that affect their ability to participate in training (transportation, funding, time, distance, etc.) How much training and education did the veterans receive and is there a correlation between training and satisfaction with their devices? What are some steps the Pittsburgh VAMC can take to ensure higher satisfaction among veterans?

**Literature Review**

Academic journals in which disabled veterans and veterans with amputations using prosthetic devices were selected in preparation for writing this proposal. Veteran satisfaction with VA healthcare as well as with prosthetics were also of particular interest. A review of the literature indicates that a great deal of research has been done in the area of veterans and amputation, pain management, and physical activity, though few made connections to patient satisfaction. For instance, the Amputee Data Repository was created to track and understand veterans with amputations as well as to track new treatment strategies, yet it does not examine a possible correlation between training and satisfaction with prosthetic devices (Webster, et al., 2020). As described by Watson, et al., (2014) a growing amount of literature looks at veteran satisfaction in surgical, anesthesiology, technology, and general healthcare, but stops short of correlating their satisfaction to training and education in the use of prosthetic devices.

A report discussed by Resnik, et al., (2019) noted that veterans who received prosthetic services provided by the VA were “less satisfied than their counterparts who received care in the private sector, suggesting a quality gap in VA care.” In 2011, a review by the Office of the Inspector General looking at combat veterans discovered that 69.6% with limb amputations were satisfied (Resnik, et al., 2019) with their prosthetic devices, making those who may be dissatisfied just over 30%. When compared to the national average, the number of veterans who are dissatisfied with their prosthesis in the Pittsburgh MSA would be approximately 1,985.

A study to examine veteran training (which includes physical/occupational therapy) and how it relates to satisfaction is justified. If veterans are satisfied with their prostheses, they will ultimately engage in more physical activity, thus experiencing weight loss, better sleep, less stress, and have a greater sense of contentment than if they spent their days eating and watching television (Littman, et al., 2017). “Patient satisfaction has been associated with better health status, improved engagement in personal healthcare, and reductions in primary care use; conversely, dissatisfaction is commonly associated with disenrollment. Research in the area of patient satisfaction is likely to lead to improvements in continuity of care, particularly in the Department of Veterans Affairs system” (Watson, et al., 2014, p. 504).

**Methodology**

**Setting and Participants**

This proposed study will be conducted in coordination with the Pittsburgh Veteran’s Administration Medical Center (VAMC) Rehabilitation and Prosthetics Services Department, which serves approximately 6,617 veterans from Pittsburgh Metropolitan Service Area (MSA) each year. Participants will be recruited through fliers placed at the VA Medical Center, along with electronic messages through the VA patient portal to those veterans who have been identified as having a prosthetic device. Veterans will be assured of anonymity as they are guided through how to participate. They will also be assured that participation is voluntary, and that they may withdraw from the study at any time.

**Research Design**

In a mixed-methods approach, the study will consist of a Phase I and a Phase II. In Phase I, the participant goal will be approximately 1,600 amputee veterans (roughly 25% of those served in the Pittsburgh MSA) and for Phase II, the participant goal will be around 100 veterans. It is anticipated that participants will be diverse, ranging in age, gender, level of education, and socioeconomic status.

Phase I of the study will be quantitative, conducted through anonymous surveys to learn about the veterans, their disabilities, the type of prosthesis they have, how they use their prosthesis, as well as the types of training or physical therapy they have received on how to use their devices. The survey will also focus on their level of satisfaction with their prosthetic devices to explore whether or not the level of training correlates to level of satisfaction. Other elements will be considered, such as distance to a rehabilitation center, transportation, and family support. As part of the survey, veteran respondents will be asked if they would like to participate in an interview to learn more about their experiences with their prostheses and any training they received. While the survey itself is anonymous, the veteran will be asked if they would like to participate in a conversation about their experiences, which would take them to a portion outside of the survey to protect their anonymity. For example, if the veteran is using the web-based survey, once they submit their responses, they will be asked if they would like to take part in the narrative portion of the study (Phase II). If they choose not to participate, the window message will express appreciation, then close. If the veteran chooses to participate, they will be asked for their contact information for follow-up purposes. If participants are using a paper version of the survey, a separate questionnaire will be included, with a separate envelope so that they may provide their contact information anonymously. Respondents may choose from in-person (if Covid-19 protocols allow), telephone, or by video meeting.

Phase II, or the narrative inquiry/qualitative method of this study, will focus on the experiences of the veteran as it relates to his or her disability and the types of prosthesis with which they have been fitted. Questions will center upon how the veteran uses their prosthesis, their experiences with training and therapy on how to use their device, who conducted the training, and how they use their prosthesis in their everyday lives. Discussion prompts will inquire about how the veteran uses the services provided by the VA Rehabilitation and Prosthetics Department, their personal circumstances, their experiences with the VA, and how their experiences may shape the use of their prosthetic devices. The goal of Phase II will be to learn through each veteran’s own words and stories and to understand their experiences in a way that cannot be anticipated or captured in a quantitative survey. Littman, et al., (2017) discuss that dissatisfaction for some veterans may exist because their devices fit poorly, thus creating reduced activities. Poor fitting prostheses create fear of the potential of falling or other accidents, eroding confidence and satisfaction with the services and devices provided to the veteran. Oftentimes, training and physical therapy could be used to overcome many obstacles to using prosthetics effectively. Qualitative and quantitative analysis will be important to examine any possible correlation between education and training to their satisfaction with the prosthetic device. The study will also aim to learn more about how the veterans view services provided by the Pittsburgh VAMC Rehabilitation and Prosthetic Services Department. The participants will know in advanced that the discussion will be recorded for later coding and evaluation. As in Phase I, results and recommendations from the narrative inquiry (Phase II) will be provided to the Veteran’s Administration.

**Instrumentation and Data Collection**

In Phase I, a survey will be designed with questions using both binary (2-option answers, such as yes or no) and Likert scales. A Likert scale provides researchers with the ability to quantify results on a five-point spectrum to gauge education and training, as well as each respondent’s levels of satisfaction with their prosthesis and the services provided by the VA. The binary scale will establish more absolute criteria, such as whether or not the respondent participated in training, etc. The timeline for participant recruitment, survey launch, and data collection will be 8 months. Once the data is collected and analyzed, a report will be shared with the VA on the findings.

In Phase II, an interview team of three people will be trained for interrater reliability. Recruitment of interview team members will consist of one military veteran, one psychologist, and one mathematician, each bringing a level of expertise and prior knowledge to the study. Once interviewers are trained, they will conduct practice interviews (Meriam & Tisdale, 2016, p. 116) to make adjustments to questions and to gain experience as an interviewer. Other expert interviewers may also be consulted on how to structure questions and for additional interview techniques. Based upon practice interviews and expert interviewer advice, additional training will be provided, as well as a meeting to further define (and agree upon) common terms. Each interviewer will be given a roster of names and contact information for veterans who have volunteered to participate in the narrative portion of the study. The timeline for Phase II of this study will be approximately 10 months.

**Data Analysis**

Since each interview will be recorded, interviewers will begin coding the data with agreed upon code words immediately after the first interview. Interviewers will review their field notes and transcripts to fine-tune codes, and perhaps narrow the code terminology as central themes and categories emerge. Throughout the process, interviewers and the researcher will meet frequently to discuss interviews, reflect upon the purpose of the study and research questions as they adjust and condense reoccurring themes. As interviewers continue to code more interviews, they may begin to see their data as “trees,” and as they accumulate trees of data, the interviewers should eventually move back to see larger themes, perhaps thought of in similar terms as “forests” (Merriam & Tisdell, 2016).

Triangulation will support internal validity, by using multiple sources of data (interviews) and multiple investigators (Merriam & Tisdell, 2016). Further, to avoid misinterpretation of interview data, validity methods will also include obtaining feedback on findings by consulting some of the veterans who participated in the interviews. This will assure interviewers that they have correctly identified core themes in the data. Once the data are compiled and analyzed, a final report will be provided to the VA on the findings.

**Resources Required**

The resources needed for this study would be funding for three interviewers, computer access for each interviewer, statistical analysis software, as well as access to Zoom or a similar program that will enable the interviewer to record and transcribe conversations. Zoom can be used to record and transcribe interviews conducted by computer, telephone, or in person. Some printing costs will be required to provide paper copies for veterans who do not use computers, or those who chose not to use a computer for the Phase I survey. In-person interviews, if requested by the participant, will be conducted in a meeting room at the Pittsburgh VA Medical Center.

**Limitations**

One limitation of this study may be the use of Likert scale type questions in Phase I. Use of a 7-point Likert scale may provide too many data points when there are a larger number of participants, while a 5-point scale may not provide enough detail about a participant’s experience. A Likert scale may also not pick up all of the nuances sought by researchers, especially if the respondent does not opt to participate in the narrative (Phase II) portion of the study. Another limitation may be that respondents may respond more negatively if response options are space too closely together, or if they are placed horizontally, which is an optimal layout for mobile devices (Weijters, et al., 2019, p 86). Special attention will need to be paid to question formatting to avoid unintentional bias of the responder, and thus causing the results to skew more negatively than is truly experienced by the disabled veteran population in the Pittsburgh MSA. Lastly, veterans may not feel compelled to participate in Phase II if they perceive the time commitment is too great or they feel uncomfortable with the questions being asked.

**Usefulness and Significance**

The goal of this study will be to understand if training veterans on how to properly use their prosthesis will lead to higher satisfaction with the device as well as with the services provided by the VA Pittsburgh Medical Center Rehabilitation and Prosthetics department. If training and education does lead to higher satisfaction, what strategies can the VA use to encourage more veterans to receive training? Phase II, the narrative inquiry portion of the study, will aim to learn more about the experience of the participants so that a recommendation can be made to the VA about the types, frequency, location of training, perceptions, and more. There does appear to be a gap in the literature in this area. Many articles document pain and pain management among disabled/amputee veterans, along with other medical conditions of veterans, but none appear to explore a correlation between training, therapy and satisfaction with prosthetic devices.

It is hoped that as a result of this study, training and services may be improved so that more veterans will feel satisfied and confident to use their prosthetic devices, and thus increase their levels of physical activity. As Littman, et al., (2017) points out, “interventions to increase physical activity may promote greater acceptance of individuals’ amputation and improve [their] quality of life.”

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