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Implementation of a Follow-up Protocol to Maximize Functional Use of Adaptive Equipment and Decrease Levels of Abandonment

Authors	Mitchel Davis
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**Implementation of a Follow-up Protocol to Maximize Functional Use of
Adaptive Equipment and Decrease Levels of Abandonment**

by

Mitchel Davis

A Capstone Project Presented to the
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Mitchel Davis

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Abstract

Background: Abandonment of adaptive equipment (AE) is a growing problem among the disabled population, particularly among those who rely on their devices to enhance independence by maximizing safety, promoting social inclusion, and increasing participation in daily activity and society (Howard et al., 2020). Abandonment of AE can often be linked to diminished client satisfaction with equipment as a consequence of a lack of fit between users, their assistive products, and users' environment (Sugawara, 2018; Kraskowsky & Finlayson, 2001). Consideration of users' individual experiences, including their desires, priorities, and opinions regarding their equipment, independence, and engagement in society, is necessary when prescribing and implementing AE to minimize the risk of discontinuation (Cruz and Emmel, 2016).

Objective: To identify, highlight, and explore the relationships between personal, environmental, and contextual factors unique to individuals who utilize adapted equipment to increase participation and engagement with daily activity to prevent abandonment of their devices.

ACOTE Area: Research (primary), Clinical (secondary)

Methods: A survey tool, the Adaptive Equipment Follow-up Protocol (AEFP), was created to assess and track users' desires, priorities, and opinions about adaptive equipment to maximize functional use of equipment and decrease the prevalence of abandonment. 31 subjects were recruited through partnerships with local Metro-Atlanta outpatient neurorehabilitation clinics to be administered the survey in person using an online platform, Qualtrics. Results were analyzed to identify unique personal, environmental, and/or contextual factors related to functioning and disability using frequencies to identify trends within the data. In addition, relationships between responses were analyzed using qualitative analysis to identify common themes within the data based on device type and prevalence of continued use. Informal analysis via journal entries was used throughout the data collection process to support conclusions.

Results: Commonly identified factors contributing to the abandonment included: no longer needed, reliance on caregiver, uncomfortable, limited by physical condition, convenience of size/weight for transportation, limited accessibility of tools/features, poor aesthetic, environmental/architectural barriers, too complex, and stigma. Each factor identified within the study demonstrated a mismatch between functioning/disability and a combination of personal, environmental, and other contextual factors using the ICF. Upon analysis of responses based on device type and prevalence of continued use, responses in the "Mobility Devices" section yielded higher levels of variability compared to responses within the "Additional Adaptive Equipment" section. There was little variability present between trends and common responses for each question between the sections. However, results based on the prevalence of abandonment yielded trends and frequencies of responses that were inconsistent with each other, indicating that the prevalence of use may have a larger impact on feelings and attitudes towards devices versus device type.

Conclusions and Relevance: Responses were shown to be highly attributed to the unique interplay of functioning and disability with personal, environmental, and other contextual factors. Consideration of these factors and relationships between them can be used to help define and predict an individual's attitudes and experience with adaptive equipment to effectively close the gap between what is known to influence the potential for abandonment of adaptive equipment. The AEFP survey can serve as a helpful tool for Occupational Therapists and other healthcare professionals to assess and track their patients' overall experience with their adaptive equipment using a holistic, person-centered approach to identify and better understand these unique factors contributing to the perceived lack of usefulness of necessary adaptive equipment.

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Chapter 1: Introduction and Literature Review

Problem

Abandonment of adaptive equipment (AE) is a growing problem among the disabled population, particularly among those who rely on their devices to enhance independence by maximizing safety, promoting social inclusion, and increasing participation in daily activity and in society (Howard et al., 2020). Abandonment of AE can often be linked to diminished client satisfaction with equipment as a consequence of a lack of fit between users, their assistive products, and their environment (Sugawara, 2018; Kraskowsky & Finlayson, 2001). Consideration of users' individual experiences, including their desires, priorities, and opinions regarding their equipment, independence, and engagement in society, is necessary when prescribing and implementing AE to minimize the risk of discontinuation (Cruz and Emmel, 2016).

Purpose

The purpose of this study was to identify, highlight, and explore the relationships between personal, environmental, and contextual factors unique to individuals who utilize adapted equipment to increase participation and engagement with daily activity to prevent abandonment of their devices.

Specific Aims

My first specific aim and primary goal of my Capstone project was *to implement a follow-up protocol to assess user satisfaction with their adaptive equipment*. The Adaptive Equipment Follow-up Protocol (AEFP) was implemented 5 days a week for 3 weeks using an online survey (via Qualtrics) with users of adaptive mobility devices. I paired with multiple

outpatient therapy clinics to implement the AEFPP with patients with varying functional capabilities who rely on mobility-related AE to participate in meaningful daily activities. Implementation of the AEFPP aimed to improve the understanding of unique client-centered factors in the prescription and implementation of AE, as well as refine a useful tool for healthcare professionals to use with patients to prevent equipment abandonment. Formative assessments were utilized throughout program implementation to refine the contents of the protocol and intervention techniques as necessary.

My second specific aim served as a subsequent goal to the primary objective of program implementation. *I used data analysis to provide results and create recommendations for the AEFPP to support future protocol implementation by the end of my capstone experience.* I administered the AEFPP using the Qualtrics online survey tool and collected qualitative data to establish validity of the protocol based on response frequencies and trends using descriptive statistics. In conjunction with ongoing research and review of the existing literature, I used these conclusions to create future recommendations and adapt the protocol itself, as well as emphasize the importance of considering unique client-centered factors when utilizing AE as an intervention to maximize functional equipment use and prevent abandonment.

My third specific aim was more specific to the research process and my Capstone project as a whole. *I increased competence in my capstone experience and improved my knowledge and understanding of the research process by the end of my doctoral capstone experience.* To complete this goal, I documented progress using weekly self-reflections throughout the entirety of the doctoral capstone experience, including research, program implementation, data analysis, and project dissemination. These reflections serve as formative self-assessments to allow me to analyze and determine best practices to guide my Capstone experience.

My last aim serves in conjunction with my previously mentioned objective: *I improved my knowledge of the continuance or discontinuance of adaptive equipment by the end of my capstone experience.* I utilized existing literature to expand my knowledge of the abandonment of AE and the importance of consideration of unique client-centered factors, while also accounting for results from protocol implementation, to create and adapt the AEFP. My third and fourth specific aims partially served as preliminary goals to the implementation of the AEFP to support effective clinical practices and considerations, while also allowing personal improvement of my independent clinical and research skills.

Outputs

The project refined and established a valid protocol to assess users' desires, priorities, and opinions about AE to maximize the functional use of equipment and decrease levels of abandonment. Personal feedback and data regarding the effectiveness of protocol implementation was analyzed to establish the validity of this protocol, as well as create recommendations for future implementation based on findings.

Outcomes

The AEFP highlights the unique factors that may influence the continued use or abandonment of different types of adaptive equipment. Findings from data implementation, in combination with an extensive review of scholarly literature, served to inform healthcare professionals of potential risk factors for the abandonment of necessary adaptive equipment. The AEFP additionally served as a helpful evaluative tool for healthcare professionals in guiding the prescription and implementation of adaptive equipment.

Literature Review

Abandonment

Adaptive Equipment (AE) can refer to any tool or device whose primary purpose is to maintain or enhance personal independence by maximizing safety, promoting social inclusion, and increasing participation in daily activity and society, as well as preventing further impairments and secondary health conditions (Howard et al., 2020; Sugawara 2018). The term “abandonment” regarding AE use refers to the discontinuance of the use of equipment. It has been cited that abandonment rates for people using AE range between 20% and 70% (Howard et al., 2020).

Abandonment of AE can have both positive and negative origins. For example, users may experience improved health conditions and no longer need their adaptive equipment. However, this scenario is often not the case. Abandonment in the negative sense may be attributed to the lack of fit between personal needs, environment, and equipment related to the interplaying variety of personal and environmental/societal factors, resulting in the nonuse (ie, abandonment) of equipment (Kraskowsky and Finlayson, 2001). Abandonment of equipment may not only deter an individual’s functional ability and social inclusion but also reflect a waste of public resources supplying the equipment. Providing the best-fitting AE can improve user functioning and facilitate independence to reduce the burden of chronic conditions on the individual, their caregivers, and the wider society, thus preventing the abandonment of equipment (Howard et al., 2020).

This review first serves to identify the environmental and personal barriers related to the abandonment of AE, as well as to highlight the importance of the consideration of unique

personal client-centered factors and contextual factors throughout the prescription and implementation of AE. The review additionally introduces an adaptive equipment follow-up protocol to help better understand these factors while utilizing a theoretical model of disability and function to justify and support the consideration of personalized care.

Factors Related to Abandonment

A review of scholarly literature was completed to identify factors related to the abandonment of adaptive equipment. Trends and commonalities were observed among qualitative literature regarding specific personal, environmental, or societal barriers identified as relative to the abandonment of AE.

Sugawara et al. (2018) conducted a survey regarding users' experience with their AE regarding the interaction between product and user, user opinion on their equipment, and unique factors leading to continuance or discontinuance of AE use based on the user's perspective. The article identified 2 main factors impacting short and long-term use of AE: users' perception of the importance or usefulness of AE and completion of rehabilitation treatment, identifying a clear need for follow-up to maximize continued functional use of AE. Kraskowsky and Finlayson (2001) conducted a systematic review to identify major findings on factors influencing the use of adaptive equipment in older adults specifically. Likewise, they found that equipment suitability (to person and environment) and adequate training contributed most highly to the rate of AE use. Therefore, a lack of consideration of these factors directly contributed to the abandonment of AE in older populations.

Cruz and Emmel (2016) conducted a cross-sectional descriptive study to identify how the acquisition, use, and abandonment of devices occurred in those who utilized AE to participate in

daily activities through interviews with users. Abandonment of AE was primarily attributed to multiple different characteristics/contexts specific to the individual. As previous articles have mentioned, factors related to rehabilitation (such as instruction and training with acquisition), along with a lack of resource monitoring by a specialized professional, remain the primary factors contributing to the abandonment of AE. The study additionally highlights the social and architectural barriers, such as accessibility of the environment and resources readily available, related to the discontinuance of AE use. The study goes on to identify a variety of unique person-centered factors as having a negative influence on the continued use of AE, whether it be the nonacceptance of handicaps and/or usefulness of the device, or even depression. Lastly, dissatisfaction with device quality, aesthetics, and security is yet another reported reason for device abandonment.

Howard et al. (2022) conducted a meta-synthesis review to further identify common barriers to acquiring and using assistive technology for users with chronic conditions as a whole. The article identified 2 key barriers regarding the effectiveness of AE to meet the needs of the user and their environment, thus supporting function and independence. Lack of user involvement in the design and decision-making process, as well as lack of readily available information about products and services, were both identified as barriers to continued AE use. This further highlights the importance of user involvement and personalized care through consideration of users' lived knowledge and experience (in contrast to the "expert" clinician model) throughout the prescription and implementation of adaptive equipment. Kinney et al. (2016) conducted a retrospective study to demonstrate the benefit of involving users throughout the design and use of AE. The study details the process of user-informed design and collaboration on a specific adaptive device, and results showed that user involvement ensured

that features were relevant to the user's functional needs regarding daily activity. This further supports the need for consideration of personal client factors in AE prescription and implementation.

The above-stated articles in conjunction serve to highlight the interplay of commonly identified personal, environmental, and societal barriers attributed to the abandonment of adaptive equipment. However, unique user-specific factors vary vastly from person to person based on the unique lived experiences of the user. Thus, a need exists to understand and account for these client-specific factors when determining the appropriate AE to fulfill the user's specific needs and maximize functional independence in order to decrease the likelihood of abandonment.

Adaptive Equipment Follow-up Protocol (AEFP)

The Adaptive Equipment Follow-Up Protocol (AEFP) was developed by students (Anna Calacone, Skyler Kellogg, Helen Song, Erin Tillery) in a previous Georgia State Occupational Therapy class to assess users' desires, priorities, and opinions about adaptive equipment to maximize functional use of equipment and decrease levels of abandonment. The protocol uses a client-centered approach to account for a variety of personal, environmental, or contextual factors contributing to unmet needs, leading to the discontinued use of AE (Giesbrecht, 2013). Creation of the protocol was guided by relevant scholarly literature and expert opinion. The students simulated the implementation of the AEFP with users, with users being allowed to provide feedback on the usefulness and usability of the protocol.

The original protocol is intended to gain insight into users of adaptive equipment's desires, priorities, and opinions about their equipment. Questions focused on users' devices

themselves, how and how often they use them, their acquisition process (including training and rehab), and overall experience with devices, as well as perceived usefulness to complete daily activities. The protocol is comprised of a mix of multiple-choice, multiple-answer, and short-answer questions. This included 15 questions broken up into 4 components: General (Q1-3), Mobility Device (Q4-7), Procurement Process (8-10), and Next Steps (11-15) that were rated on the perceived usefulness of each question using a 5-point Likert scale (1- Not Useful, 2- Somewhat Useful, 3- Useful, 4- Very Useful, and 5- Necessary).

Based on previous implementation, the AEFPP was found to be a user-friendly follow-up protocol that encompasses all necessary aspects of an evaluation, utilizes universal language, and shows positive potential for individuals who are at risk for abandonment of their AE or are actively in the equipment procurement process. However, limitations were present throughout the study, including a small sample size (n=10) and only receiving positive feedback from patients, contributing to the lack of refinement of the protocol itself. This presents a need to assess a wider population of those who utilize adaptive equipment daily, including those who have been prescribed equipment more recently, as well as those who are dissatisfied or have abandoned their AE, in order to gather more useful data for refinement of the protocol.

Chapter 2: Needs Assessment

Introduction

Further implementation and refinement of the Adaptive Equipment Follow-up Protocol (AEFP) could decrease device abandonment in those who benefit from the utilization of adaptive mobility devices to maintain their independence and contribute to society, while also serving as a proactive tool for occupational therapists to utilize upon the AE prescription and intervention process. However, further input from expert informants was needed to refine the protocol. To refine the instrument, a follow-up needs assessment survey was conducted with OTs and OTA's regarding the perceived usefulness of an Adaptive Equipment Follow-up Protocol in its ability to identify personal client-centered factors related to users' experience with adaptive equipment. The survey was approved by the Georgia State University Institutional Review Board.

The objectives of the needs assessment were to:

1. Develop and implement an online needs assessment survey with OT's and OTAs.
2. Analyze responses to determine the extent to which respondents thought the Adaptive Equipment Follow-up Protocol would identify personal client-centered factors.
3. Determine the usefulness of the Adaptive Equipment Follow-up Protocol to decrease abandonment.
4. Identify necessary changes to adapt and refine the Adaptive Equipment Follow-up Protocol based on the needs assessment.

Participants

Fifteen OT's and OTA's were recruited via direct email and research postings through state- and national-level Occupational Therapy organizations' websites (GOTA and AOTA) to participate in an online survey via Qualtrics.

Instruments

A 20-question survey was developed (a mix of multiple choice and short answer) regarding the usefulness of the original AEFP to identify client-centered factors related to users' experience with adaptive equipment. In addition to the 15 Likert scale questions (1- Not Useful, 2- Somewhat Useful, 3- Useful, 4- Very Useful, and 5- Necessary) on the original AEFP, the online needs assessment survey included 5 additional questions regarding the effectiveness and limitations of the AEFP overall, as well as 3 free response questions to allow for expert feedback and recommendations from healthcare practitioners.

Data Analysis

Answers were recorded, and descriptive statistics were used to calculate means of responses to each question to determine their individual perceived usefulness, as well as to analyze trends and determine the overall perceived usefulness of the AEFP. Questions with mean scores ranging from 0.5-1.49 were considered "Not Useful," those ranging from 1.5-2.49 were considered "Somewhat Useful," 2.5-3.49 considered "Useful," 3.5-4.49 considered "Very Useful," and 4.5+ considered "Necessary."

In addition to calculating means, a frequency count was completed to determine how many participants rated each question as either "Useful," "Very Useful," or "Necessary." Any question with ≥ 4 out of 7 responses falling within these categories was considered important and would be included in the final version of the AEFP. Outliers and biases were also noted in the data analysis. One participant responded to every question as "Not Useful," presenting a response bias and a barrier to accurate data collection. As a result, this participant was not included in the analysis, so the results were based on the remaining 6 responses.

Lastly, free responses were analyzed, and recommendations were considered when determining the usefulness of the AEFP to identify personal client-centered factors related to users' experience with adaptive equipment to assist in decreasing levels of abandonment. All data was collected completely anonymously and stored on a password-protected, encrypted computer.

Usefulness of the AEFP

Means for each question ranged from 2.83 (falling into "Useful" category) to 4.83 (falling into "Necessary" category) regarding their perceived usefulness. Questions with a mean of 3.5 or above (i.e., "Very Useful" to "Necessary") were Q2–Q7 and Q11–Q17, all of which had at least 2 responses indicating the question as necessary. The question yielding the highest results was Q13, with a mean of 4.83, falling into the "Necessary" category. Questions with a mean below 3.5 (i.e., "Useful" or below) were Q1 and Q8–Q10. Although these questions were reported at a lower level of importance, individual results indicated some level of need for each question. Q1 had the highest level of "Useful" responses (4 total with a weight of 3 each) Q8 had the highest level of "Very Useful" responses (4 total with a weight of 4 each) compared to other answer choices. Question 9 had 3 "Useful" and 4 "Very Useful" responses, however it was the only question with more than one response of "Not Useful" (2). Q10 had 1 "Necessary" response and 5 "Useful" responses, resulting in an average of 3.33. Although these questions were rated the lowest, each still fell within the range of "Useful" based on all participants' responses.

Effectiveness, Limitations, and Feedback

Free responses allowed respondents to provide personal feedback regarding additional important aspects to consider upon the refinement and implementation of the AEFP. These three questions asked respondents to: 1. Identify any items/areas of interest they found most important,

2. Identify any items/areas perceived as less important, and 3. Provide any additional feedback on the AEFP itself.

In response to the question pertaining to items they found most important, respondents identified important themes within the survey, including caregiver's indication of level of usefulness of devices and education on equipment use, as well as age and how often they use the device. Multiple respondents identified questions regarding the current level of function and how devices support function as important to healthcare practitioners using the device to ensure client-centered care. In response to the second question regarding less important areas of interest, only one respondent provided feedback stating "Not really. It all feels quite relevant." In response to the last question regarding any additional feedback, only one response was recorded. This respondent pointed out that the rating scale was initially hard to follow due to the nature of a survey intended to measure the usefulness of another survey.

Discussion

Upon analysis of responses, trends were noted within the data. Questions regarding Mobility Device (Q4 – Q7) and Next Steps (Q11 – Q15) yielded the highest level of importance among all participants, with questions regarding Procurement Process (Q8 – Q10) yielding the lowest overall level of importance. A particularly high level of importance was placed on the training/education received, as well as its impact on function, in determining client factors related to the continuance of device usage. Additionally, each question yielded values falling into the categories of either "Useful," "Very Useful," or "Necessary," indicating a sufficient level of need for each question included in the AEFP.

Free responses served to highlight multiple important areas of interest within the survey. Although these responses helped justify the inclusion and consideration of these factors in the

administration of the AEF, they did not have an impact on the revision of the AEF.

Additionally, due to a lack of free responses identifying less important areas of interest (along with positive multiple-choice responses), all original questions were included in the final version of the AEF. The feedback reported in the final free response question was also considered, but did not change the final version of the AEF. The rating scale may have been difficult to follow due to the nature of respondents answering multiple-choice questions based on the usefulness of other questions. However, this barrier was not present during the implementation of the AEF with users of AE, as respondents only answered questions related to themselves directly.

Limitations were noted within the study. Despite mostly positive responses, only 7 total participants responded to the survey, and only 6 answers were recorded ($n < 30$). Additionally, free responses failed to garner much constructive feedback and did not contribute to the revision of the AEF. A larger sample size and/or more specific questions regarding specific components or sections of the AEF could also serve to potentially further support the revision and implementation of the AEF.

Conclusion

Overall, participants viewed the AEF as either useful or very useful in its ability to identify client-centered factors relating to users' experience with adaptive equipment based on calculated means. Although respondents placed a higher level of importance on certain questions over others, all questions were considered at least useful in some sense. Therefore, all previous questions were included in the implementation of the AEF. Responses and recommendations, along with current scholarly literature, were considered throughout protocol implementation to support potential protocol adaptation and refinement. Using expert opinion, the Adaptive Equipment Follow-up Protocol was established as a useful tool for healthcare professionals to

identify personal client-centered factors related to users' experience with adaptive equipment upon initial prescription and intervention to decrease levels of abandonment.

Chapter 3: Theories and Models

International Classification of Functioning Model

To further understand these unique user-centered factors contributing to the functional use of adaptive equipment, there is a need to account for multi-dimensional concepts related to and impacting those with disability. Disability is an umbrella term for impairments, activity limitations, and participation restrictions, referring to the negative aspects of the interaction between an individual and that individual's contextual factors, which can act as barriers or facilitators (Leonardi et al., 2022).

The International Classification of Functioning, Disability, and Health (ICF) serves as a conceptual biopsychosocial frame of reference to provide a holistic understanding of an individual's functioning and disability as a result of the dynamic interaction between health conditions and contextual factors. The ICF was formally known as the International Classification of Impairment, Disability, and Handicap (ICIDH), but was adapted in 2001 to demonstrate a shift from the idea of "consequences of disease" to "components of health" (Kearney & Pryor, 2004).

The ICF is a globally accepted model of a universal language for the description and classification of functioning (Rauch et al., 2008) that is often utilized to support clinical practice, policy development, and education (Leonardi et al., 2022). Utilization of the ICF in rehabilitation has been shown to improve multidisciplinary communication, as well as communication with rehabilitation professionals and their patients (Stucki et al., 2009), thus allowing the opportunity for more client-based practice. An article by Leonardi & Fheodoroff (2021) provides an example of this by outlining how the ICF allows rehabilitation specialists in stroke rehab to describe

individual levels of functioning and disability to set treatment goals and identify barriers and facilitators to individual functioning and health.

The ICF can provide a coherent view of health from a biological, individual, and social perspective. The ICF places a large focus on the interaction between health conditions and contextual factors to capture the complexity of individuals' functional deficits as a result of disability. The ICF can be broken down into 2 main components with subcomponents: 1. Functioning and disability, including body functions and structures (both physical and psychological) and activities and participation, and 2. Contextual factors (including both environmental and personal factors). (Kearney & Pryor, 2004) In a qualitative study, Noe et al. (2021) determined 3 emerging themes as a result of interactions between these components:

1. The influence of body function, activity, participation, and environment on an individual's ability to handle daily tasks of personal importance
2. The influence of the environment in combination with body function, activity, and personal factors on an individual's ability to maintain their social roles
3. The influence of personal factors and body functions on an individual's confidence in participating in activities they like

The ICF can serve as a helpful tool in the prescription and implementation of adaptive equipment by providing a holistic understanding of the client's functional needs and contextual factors to facilitate functional independence and prevent abandonment of AE.

Although personal factors are identified as contextual factor playing a role in the interconnectedness of the ICF and its components of health, they are not currently specifically classified in the ICF due to a lack of clarity in the scope of these factors, as well as the presence of social and cultural diversity. Lack of understanding, leading to a lack of consideration of these

factors, creates a barrier to providing holistic treatment (regarding AE intervention). Thus, a need exists to be able to identify these factors to provide holistic treatment. Karhula et al. (2021) conducted a scoping review demonstrating the wide range of personal factors that play an important role in the rehabilitation process. The study outlines 7 categories of personal factors that should be considered when utilizing the ICF: socio-demographic factors, position in the immediate social and physical context, personal history and biography, feelings, thoughts and beliefs, motives, and general patterns of experience and behavior.

These factors must be considered when prescribing and implementing AE to account for users' individual experiences, including desires, priorities, and opinions regarding their equipment, independence, and engagement in society. Lack of consideration of these factors often results in a lack of fit between users, their assistive products, and their environment, thus resulting in nonuse and eventual abandonment of AE. Thus, the consideration of unique user factors in combination with the use of the ICF facilitated the continued use of AE and maximize function and independence for the user. However, a need still exists to identify and understand these client-centered factors to reduce the likelihood of abandonment. Additionally, a need exists to better understand the interplay of personal and contextual factors in regards to how these together may impact continued use or abandonment of AE.

Human Activity Assistive Technology Model

Another theoretical framework that guided the development and implementation of the Adaptive Equipment Follow-Up Protocol (AEFP) was the Human Activity Assistive Technology (HAAT) model. The HAAT model provides a foundation for occupational therapists to analyze barriers related to the user, the device, activity engagement, and a variety of contextual factors (physical, social, cultural, and environmental) to determine unmet needs relating to the lack of fit

between these. The model utilizes a client-centered approach to describe user opinion/satisfaction of adaptive equipment (AE) use by integrating a social model of disability, concepts from occupational therapy theory, and principles of assistive technology adoption and abandonment. Consideration of these factors was used to implement and refine the protocol to better address client needs and opinions of their assistive devices to maximize functional use of equipment and decrease levels of abandonment (Giesbrecht, 2013).

Chapter 4: Methods

Project Design

This research-based capstone project employed an in-person survey methodology using a revised version of the Adaptive Equipment Follow-up Protocol (AEFP) instrument to gain insight into the unique personal and contextual factors that influence the continued use or abandonment of adaptive equipment (AE). A revised AEFP was developed to assess users' desires, priorities, opinions, and perceived effectiveness of their AE in order to maximize functional use of equipment and decrease levels of abandonment. In addition, the instrument uses a client-centered approach to account for a variety of personal, environmental, or contextual factors contributing to unmet needs, leading to the discontinued use of AE (Giesbrecht, 2013). The project was approved by the Georgia State University Institutional Review Board.

Participants

A total of 31 participants were directly recruited through partnerships with two local Metro-Atlanta outpatient neuro-rehabilitation clinics, Rehab Without Walls (Lawrenceville, GA) and Rehab and Beyond (Tucker, GA), to take part in this study. Data collection was completed over four weeks at both sites. Patients at these clinics who were appropriate for the study (ie, met all the inclusion criteria) were given a survey to assess their unique and individual experiences and opinions regarding their personal adaptive equipment use and satisfaction. Inclusion criteria require that participants must be over the age of 18, must be currently using or report prior use of at least one piece of adaptive equipment, and must provide informed consent prior to survey administration. The survey is intended to be used as an evaluative tool; thus, participants were only administered the survey once.

AEFP Instrument

Revision Process

The original version of the AEFP underwent a rigorous revision process throughout the Needs Assessment and initial implementation process to improve the survey's ability to identify unique factors that may influence the use or nonuse (ie, abandonment) of adaptive equipment. Feedback from patients during the original implementation process was also utilized to inform revisions.

Revisions focused first on the overall structure of the AEFP. The original version focused primarily on preferred devices and focused solely on those assisting with mobility. To address all forms of adaptive equipment, an additional section was included after the original section to address these devices using the same questions. In addition to this, each section was further broken down into "most useful" and "least useful" sections. The addition of the "least useful" selection was implemented to provide more insight into the unique personal and/or contextual factors influencing the risk for abandonment of these devices. Questions within these sections were then rewritten to further address the risk of abandonment. To assess frequency of use, for example, instead of inquiring how long and how often the device was used, this section asks whether the device is still in use at all (to address the prevalence of abandonment). Questions regarding the level of difficulty and factors contributing to the lack of perceived usefulness were added to this section as well.

The revised version of the survey was significantly longer than the original. To address this issue, certain variables that seemed less pertinent to the overall goal of the study (to identify unique personal/contextual factors influencing the use/nonuse of AE to prevent abandonment) were removed. Examples of variables included age, caregiver assistance, the device acquisition

process, and specific changes to be made to devices. The finalized version of the AEFP is comprised of 34 questions.

Once revisions were made, the AEFP was piloted over the course of one week at Rehab Without Walls in Lawrenceville, GA. After initial implementation was completed this week, further revisions were made to more accurately identify unique personal and contextual factors related to continued use and/or abandonment of adaptive equipment. These revisions served to create the final version of the AEFP, which would be used to collect and analyze data for the remainder of the study.

Final Instrument

The final version of the AEFP can be broken down into 2 main sections based on the type of assistive device(s): 1. Mobility equipment (such as wheelchairs, canes, walkers, and lower extremity orthotics), and 2. Additional Adaptive Equipment (such as devices to assist with dressing/eating, as well as visual/auditory/verbal aids). For each section, patients are asked to identify all devices they either currently use or have used in the past to improve participation in daily activity. Patients are then asked to determine which of these devices they perceive as the “most useful” or helpful devices, along with which they perceive as “least useful.”

Once these were identified, each section is further broken down into two subsections, one containing questions pertaining to the piece of equipment identified as “most useful,” and the other about the item perceived by the participant as “least useful.” Questions within these subsets aim to gain insight into the participants’ overall experience and perception of the usefulness of their devices, including:

- Frequency of use (how long and often for most useful vs. prevalence of abandonment for least useful)

- Daily activities in which the device is/was use(d)
- Perception specific aspects of device and use (including complexity, comfort, durability, maneuverability, accessibility, size/weight, aesthetic, and overall)
- Training received, effectiveness of training, and desire for additional training

The final version of the AEFP enabled participants to have the option to respond only to sections that are applicable to devices they either own or have owned in the past. It was structured as follows.

1. Identify all types of Mobility Devices either currently being used or that was used in the past.
2. Out of all devices identified, allow participants to identify which device they perceive as “most useful,” then which they perceive as “least useful.”
3. Answer questions in the section pertaining to their “most-useful mobility device.”
4. Answer questions in section pertaining to their “least-useful mobility device.”
5. Repeat the process for both “Additional Adaptive Equipment.”

Data Collection

The revised version of the AEFP was implemented for a total of three weeks between two local Metro-Atlanta outpatient neuro-rehabilitation clinics, Rehab Without Walls (Lawrenceville, GA) for one week, and Rehab and Beyond (Tucker, GA) for two weeks. Patients at each location were required to sign a form of consent allowing the interviewer (me) to observe throughout their 45-minute to 1-hour session. If a patient met all necessary inclusion criteria for the study, the therapist would confirm with the patient that he or she would be willing to participate in the survey. If the patient agreed, the interviewer would administer the survey either directly

following sessions or during breaks throughout the session, depending on time scheduling and time constraints.

The survey itself was administered in person with patients at each location using an online survey platform, Qualtrics. Responses were stored anonymously within the Qualtrics database to be analyzed once the data collection process was completed. The survey generally took between 5 and 15 minutes to complete, depending on which sections participants provided responses for. An average of 10 surveys were conducted per week for a total of 31 responses.

Outcome Measures

Results from the Adaptive Equipment Follow-Up survey were analyzed (in combination with key findings from existing scholarly literature) to identify unique personal, environmental, and/or contextual factors influencing the continued use or abandonment of adaptive equipment among participants. Data was analyzed qualitatively to identify trends, as well as quantitatively using frequencies and descriptive statistics. The analysis portion of this study was completed once data collection was completed in its entirety. Additionally, the ability of a the AEFU to effectively serve as a helpful tool for healthcare professionals to utilize with clients (either during the prescription/implementation of adaptive equipment or as follow-up for devices previously in use) to identify areas of strength/weakness and either enhance functional use or reduce risk of abandonment was also assessed based on collected data and user feedback. Weekly self-reflections served to informally assess strengths and weaknesses within the survey and study as a whole, as well as begin to draw conclusions based on observations.

Data Analysis / Statistical Analysis

Descriptive statistics were used to analyze the frequencies of responses within both “Least-Useful” sections as a whole (with results from both “Mobility Devices” and “Additional Adaptive Equipment” sections combined) in order to determine why these devices were less preferred. Variables of interest for these sections included:

1. Prevalence of Abandonment (Is the device still being used?)
2. Difficulty of Use
3. Factors Contributing to the Lack of Perceived Usefulness of the Device
4. Training Received
5. Effectiveness of Training
6. Desire for Additional Training

Results gathered from this section were used to support the main outcomes and conclusions.

Once descriptive statistics were completed, frequencies of these factors were compared between “mobility devices” and “additional adaptive equipment” to identify trends and risk factors that influence the potential for abandonment-based discrepancies between the two groups. Similarly, the “Least Useful” section was dissected based on whether patients responded they were either “still using their equipment,” “still using but not in a long time,” or “no longer using their equipment.” Likewise, quantitative analysis was used to outline responses, highlight discrepancies between groups, and support the project overall.

NOTE: The analysis portion of this project did not highlight discrepancies between specific devices individually (ie, cane vs walker), but rather specifically on the user’s experience with and opinions on the perceived usefulness of their equipment.

Throughout the AEFP revision and implementation process (prior to the completion of the data collection process), informal analysis was used to draw initial conclusions based on observable trends and participant feedback throughout the data collection process. Weekly self-reflections were conducted to record findings and progression throughout the data collection process. This process would ultimately serve to inform the main topics of focus throughout the remainder of the data analysis.

Chapter 5: Results

The following sections outline the results within each section and subsection of the Adaptive Equipment Follow-up Protocol survey. Results were analyzed to identify trends and commonly reported risk factors that may influence the potential for the abandonment of adaptive equipment. Percentages were presented in regard to responses per sample size for each question.

Responses to “Least Useful” Devices: Total (n=41)

Out of all participants, 41 responses were recorded identifying a “Least Useful” piece of adaptive equipment in either the “Mobility Devices” section or the “Additional Adaptive Equipment” section. The following sections report the frequencies of responses to questions pertaining to identified variables of interest (listed in Methods under “Statistical Analysis”).

Prevalence of Abandonment

The most common answer choice regarding whether or not their equipment was still being utilized was “No longer using equipment” (65.9%), indicating that the majority of participants had abandoned their adaptive equipment. The second most common answer choice was “yes, but not in a long time” (22%), and the least common answer choice for this section was “yes, still using equipment” (4.9%). This demonstrates that the frequency and prevalence of continued use had an inverse relationship with the perceived usefulness of identified devices.

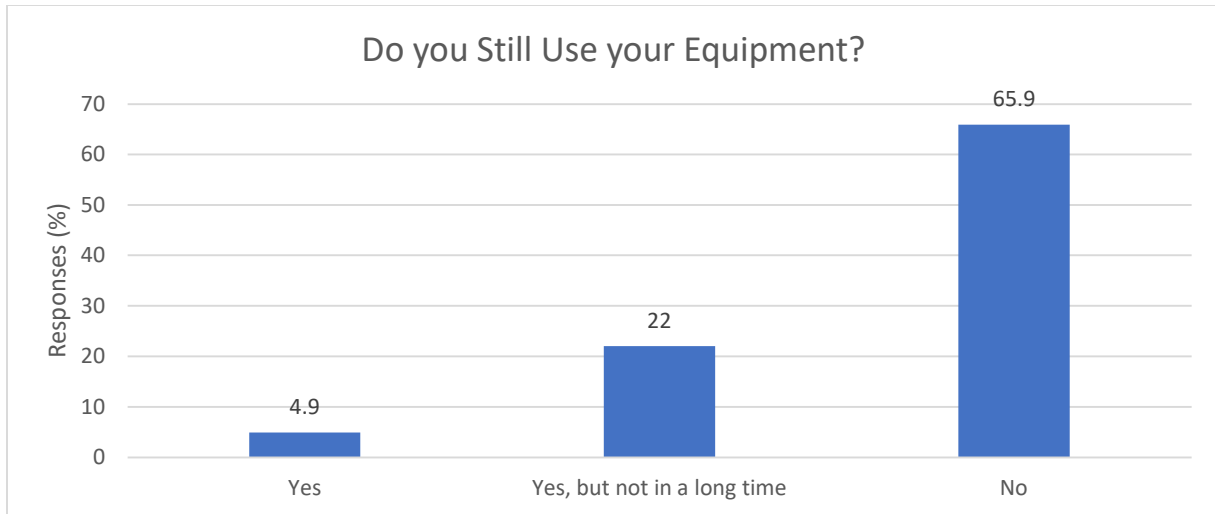


Figure 1: “Do you Still Use your Equipment?” Responses from “Least Useful Devices”

Factors Contributing to Lack of Perceived Usefulness

In analyzing responses to the question titled “Which of the following factors contributes to the perceived lack of usefulness of this device regarding participation in daily activities?” in total, each answer choice provided was chosen at least once by at least one participant (excluding “misplaced device”).

The most common chosen answer was “No Longer Need Equipment” (65.9%), which was reported more than twice as often as the second chosen answer. This may indicate that a majority of participants who had identified a “Least Useful” piece of adaptive equipment had either progressed out of their equipment throughout the rehabilitation process or found better solutions.

The second top three choices were “Reliance on Caregiver” (31.7%), “Uncomfortable” (31.7%) and “Limited by Physical Condition” (24.4%). Additional factors identified by participants that contribute to lack of perceived usefulness included “Convenience of Size/Weight for Transportation” (17.1%), “Limited Accessibility of Tools/Features” (17.1%),

“Poor Aesthetic” (17.1%), “Environmental/Architectural Barriers” (14.6%), “Too Complex” (14.6%), “Stigma” (12.2%), and “Low Quality” (2.4%).

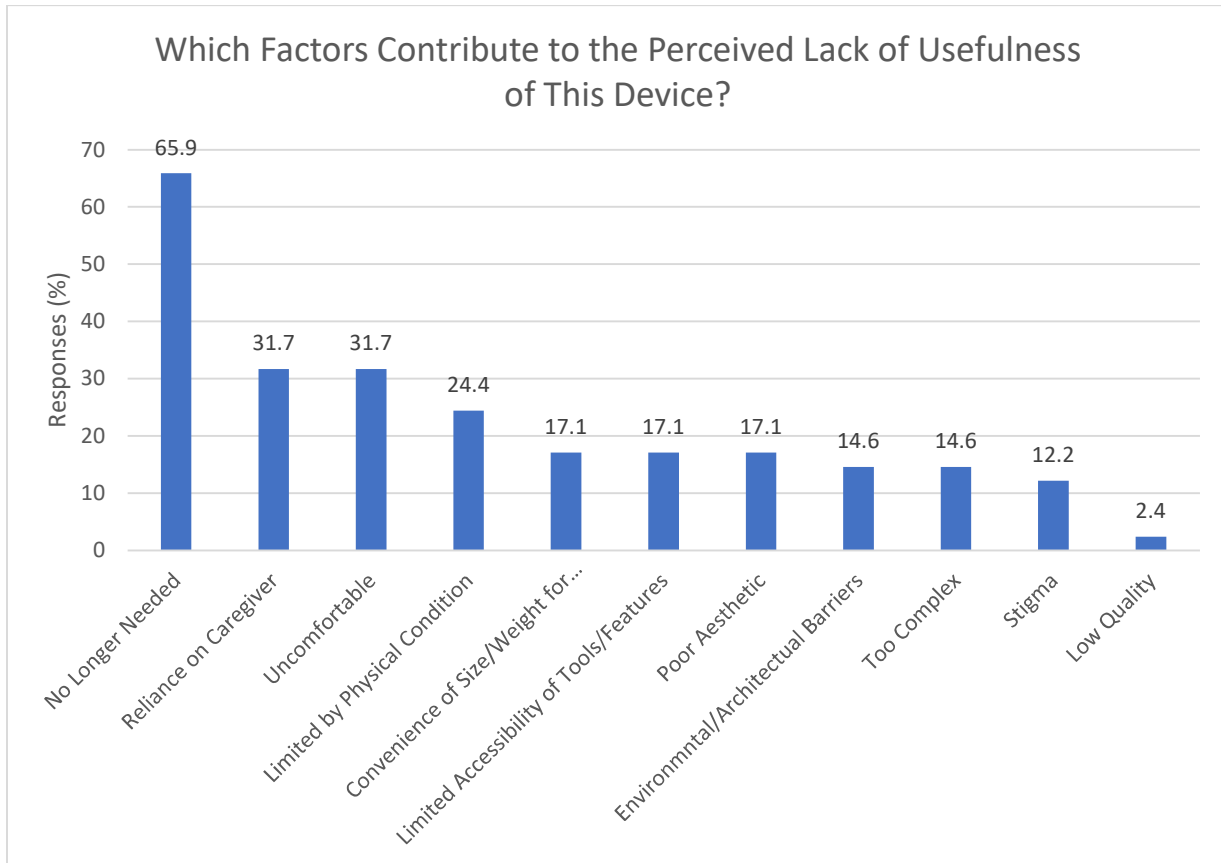


Figure 2: “Which Factors Contribute to the Perceived Lack of Usefulness of This Device?”

Responses from “Least Useful Devices”

Difficulty of Use

“Level of difficulty of use” yielded a high level of variability regarding answer choices. The most commonly chosen answer choice was “not difficult” (n=16). This may correlate directly with the highest reported factor contributing to lack of perceived usefulness being “no longer needed.” Somewhat difficult (26.8%) and very difficult (31.7%) yielded comparable results, whereas “impossible” presented as the least commonly selected answer choice at 4.9%.

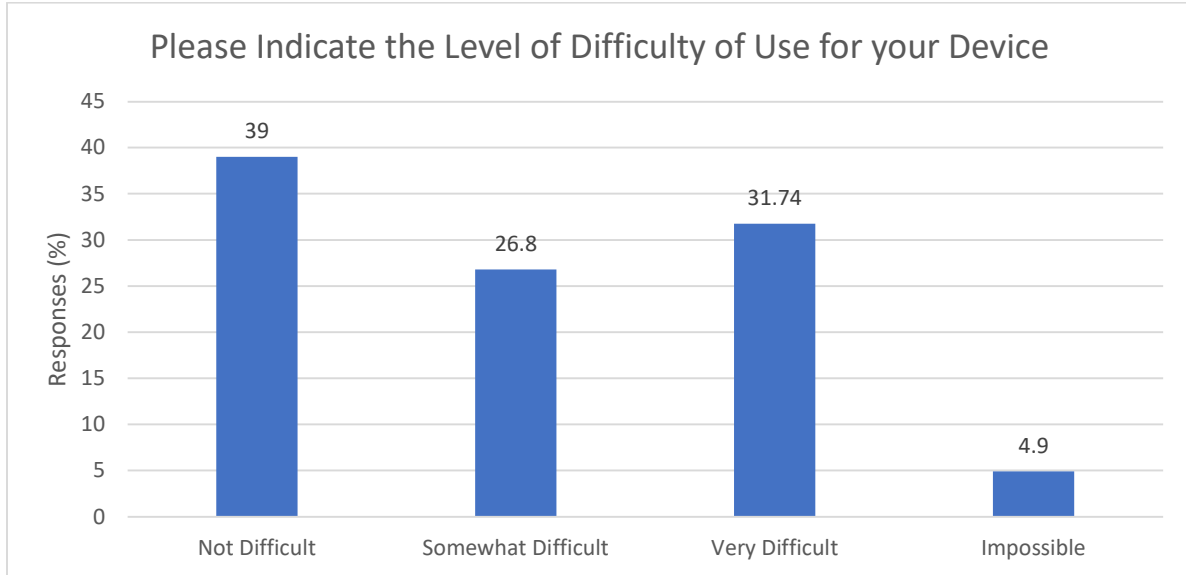


Figure 3: “Please Indicate the Level of Difficulty of Use for your Device” Responses from “Least Useful” Devices

Training

Regarding the training that participants reported receiving for their “Least Useful” devices, a majority of participants claimed that they received some degree of “hands-on training from a healthcare professional” (73.2%). This indicates that the prescription and implementation of these devices were involved in the rehabilitation process at some point to some degree. However, the second most common answer choice reported by participants was “none” (19.5%), indicating these devices may have been acquired through other means outside of the rehabilitation process. Despite not gaining a significant number of responses, other identified forms of training received included: pamphlets/educational materials, video demonstrations (or other online educational materials), and demonstrations from paid caregivers.

A majority of those who received training reported that it was either effective (39%) or somewhat effective (31.7%) versus those who reported training as “ineffective” (9.8%), indicating that training was seen as effective to some degree overall. With this being said, a vast majority reported that they did not feel as if they would benefit from any additional training (82.9%), compared to the few who felt that additional training would be beneficial (14.6%). Despite not gaining a significant number of responses, other identified forms of training patients felt as though may be beneficial to increase functional use included: Pamphlets/educational Materials, video demonstrations (or other online educational materials), demonstrations from paid caregivers, and hands-on training from a non-healthcare professional. The claim that a majority of patients received training that was seen as beneficial to some degree, along with the claim that a majority of patients noted that they would not benefit from any additional training, aligns with the highest chosen factor contributing to lack of perceived usefulness being “no longer needed.”

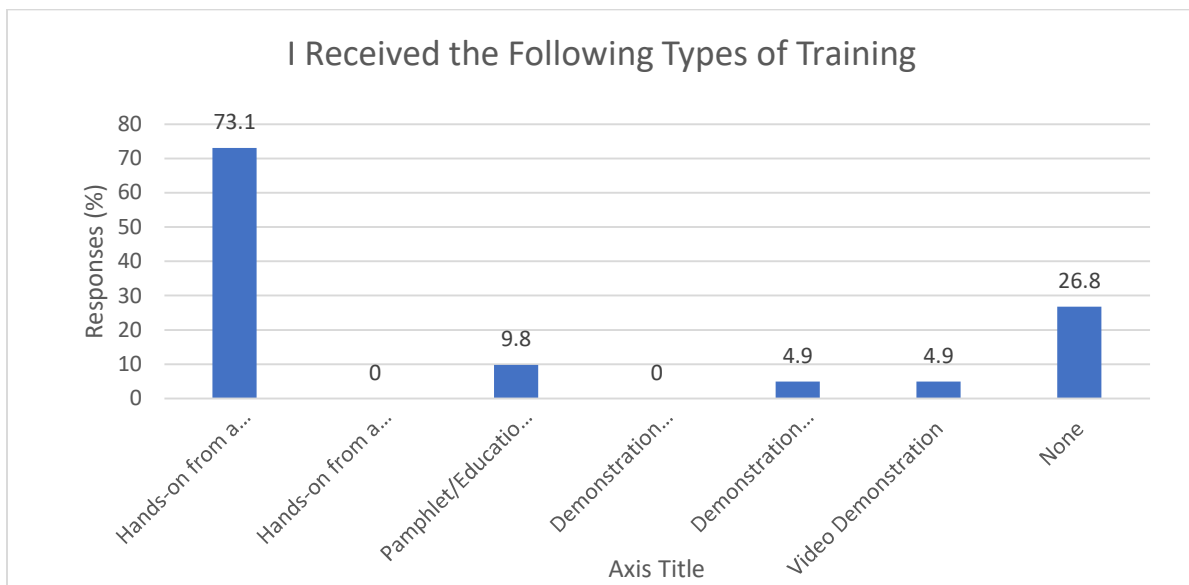


Figure 4: “I Received the Following Types of Training” Responses from “Least Useful” Devices

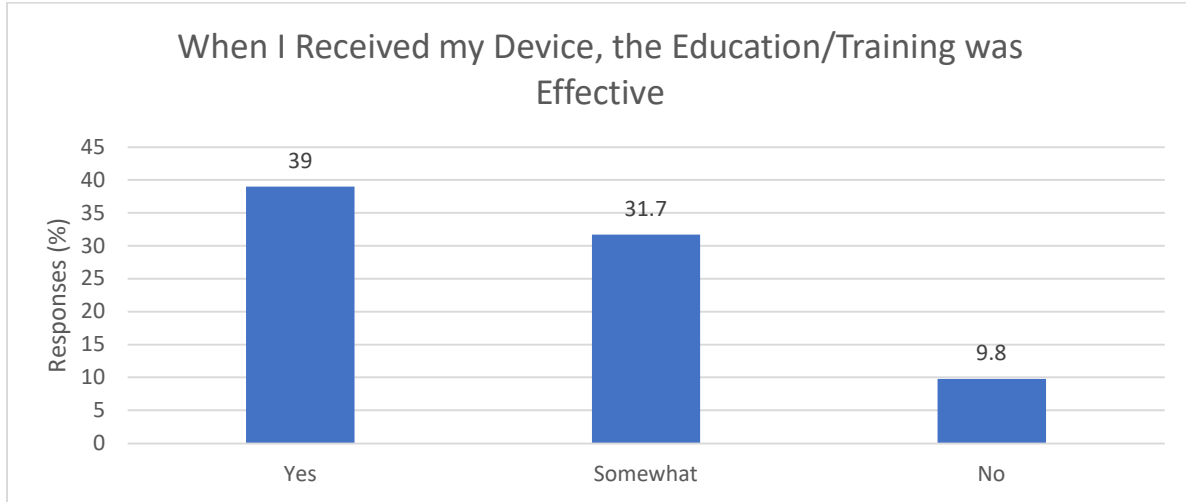


Figure 5: “When I Received my Device, the Education/Training was Effective” Responses from “Least Useful” Devices

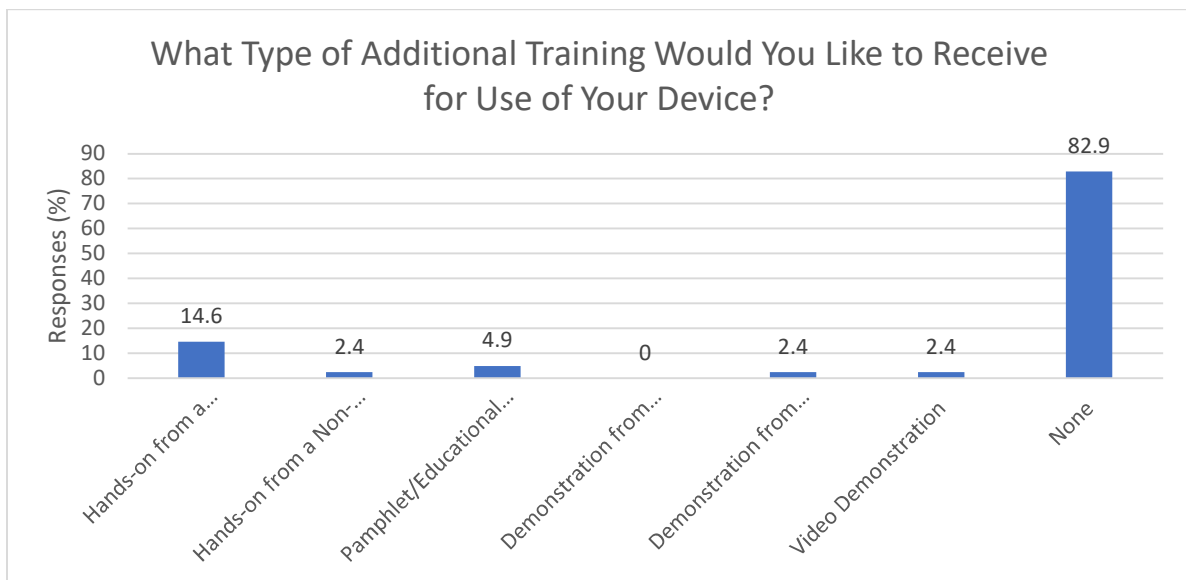


Figure 6: “What Type of Additional Training Would You Like to Receive for Use of Your Device?” Responses from “Least Useful” Devices

Responses to “Least Useful” Devices: Based on Device Type

Values from both “Least Useful Mobility Devices” and “Least Useful Additional Adaptive Equipment” were compared with one another to determine discrepancies between the two groups.

Mobility Devices (n=27)

When examining the prevalence of abandonment among those who identified a “least useful mobility device,” a majority of participants stated they were “no longer using these devices” (59.3%) compared to those who said they were “still utilizing their devices (14.8%)” or “still used their devices but had not used them in a long time” (22.2%). Regarding level of difficulty, the data presented an even split between “not difficult” (29.6%), “somewhat difficult” (37%), and “very difficult” (37%). However, no one said that their device was impossible to use (n=0). The most commonly reported factor contributing to the lack of perceived usefulness of their least useful mobility device was no longer needing the device (59.3%). The next top three most common responses were reliance on a caregiver (33.3%), uncomfortable (29.6%), and limited by physical condition (25.9%).

Regarding the training participants reported receiving, a majority of participants recounted receiving some degree of hands-on training from a healthcare professional (74.1%). The second most commonly identified answer was “none” (25.93%). Regarding the perceived effectiveness of training, there was a near even distribution between yes (40.7%) and somewhat (33.3%). “Not effective” was the least commonly chosen answer (7.4%). A vast majority of participants reported that they would not benefit from additional training (81.5%), whereas the remainder of participants identified that they would benefit from additional hands-on training from a healthcare professional.

Additional Adaptive Equipment (n=14)

For this section, a majority of participants responded that they were no longer using their device (78.6%). Three people noted that they still used the device, but not for a long time (21.3%), but no one said they still used their device. Regarding the difficulty of use, a majority of participants responded, “not difficult” (57.1%) compared to “somewhat difficult” (7.1%), “very difficult” (21.4%), and “impossible” (14.3%). With this being said, a majority of patients stated that they “no longer needed” their devices (78.6%).

Nearly every participant reported receiving some degree of hands-on training from a healthcare professional (71.4%), excluding one participant who reported having received no training at all (7.1%). The perceived effectiveness of training for this section was highly variable. However, a majority of participants stated that training was either effective (35.7%) or somewhat effective (28.6%) compared to those who deemed the training received as ineffective (14.3%). Despite this variety of perceived effectiveness of training, a majority of participants stated that they would not benefit from any additional training (85.7%).

Comparison between Responses for “Least Useful Mobility Devices” and “Least Useful Additional Adaptive Equipment”

Participants who responded to both “Mobility Devices” and “Additional Adaptive Equipment (AE)” groups reported that a majority of participants were no longer using their devices. This remains consistent with data presented from both “Least Useful” groups as a whole. However, continued use was reported at a higher rate in the mobility group compared to the additional AE (who reported none were currently using their additional AE they identified as least useful). Regarding the perceived difficulty of use for both sections, there was much more

variability in responses within the mobility group compared to the additional AE (where a majority of patients reported “not difficult”).

For both groups, the most commonly reported factor contributing to the lack of perceived usefulness of their devices was “no longer needing their device.” However, the mobility device group yielded more variety compared to the other groups regarding contributing risk factors, as every option for this question was chosen at least once by at least one participant (excluding “misplaced device”).

Regarding the training involved, a vast majority of participants in both groups reported receiving some degree of hands-on training from a healthcare professional, with the second most common answer for both groups being “none” as well. Likewise, a majority of participants who responded to both groups reported that training was either effective or somewhat effective. However, responses generally leaned more positively towards assistive devices. When responding to whether or not participants feel as if they would benefit from additional training, a majority of participants reported “none.” For both groups.

Data collected within the “Mobility Devices” group was much more variable (regarding responses and attitudes expressed within responses, whether positive or negative) than that of “Additional AE.” However, both groups yielded similar trends and commonalities compared to the data from “Least Useful” devices as a whole.

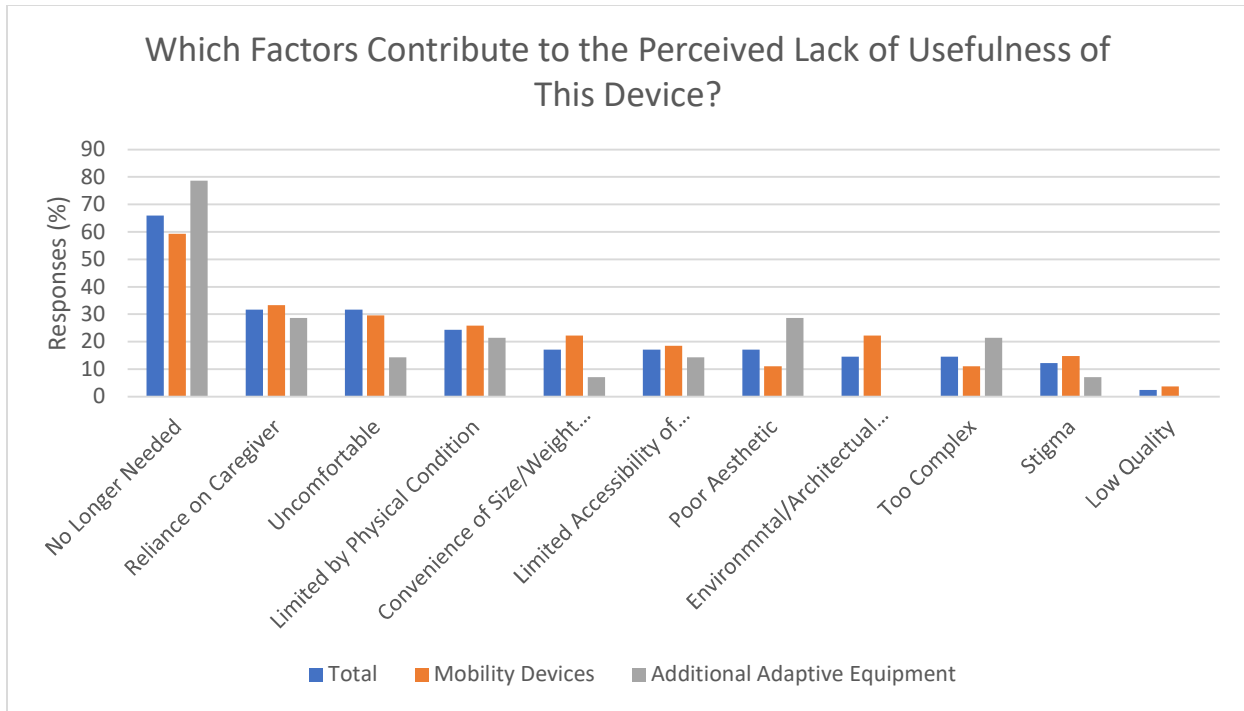


Figure 7: “Which Factors Contribute to the Perceived Lack of Usefulness of This Device?”

Responses from Device Type

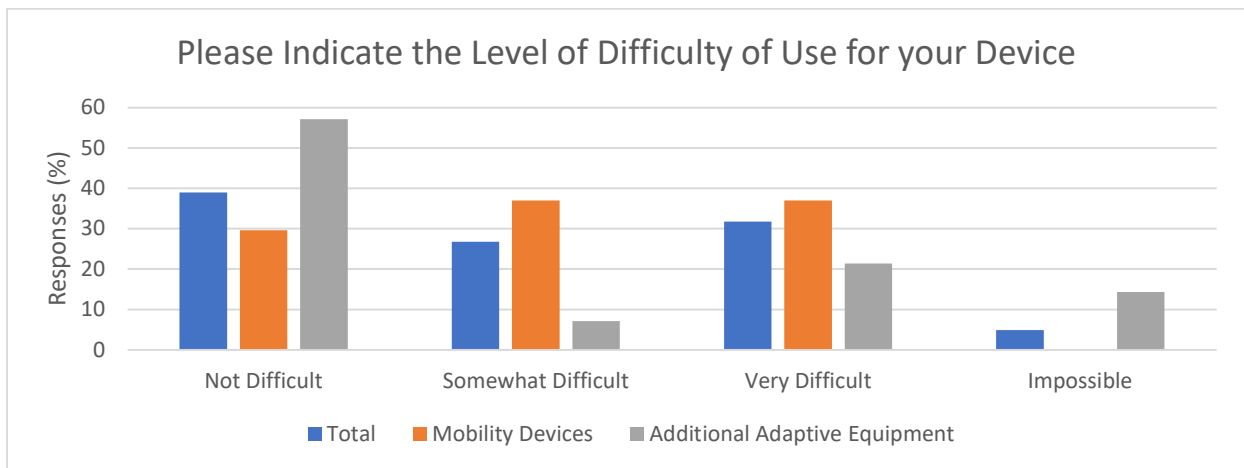


Figure 8: “Please Indicate the Level of Difficulty of Use for your Device” Responses from Device Type

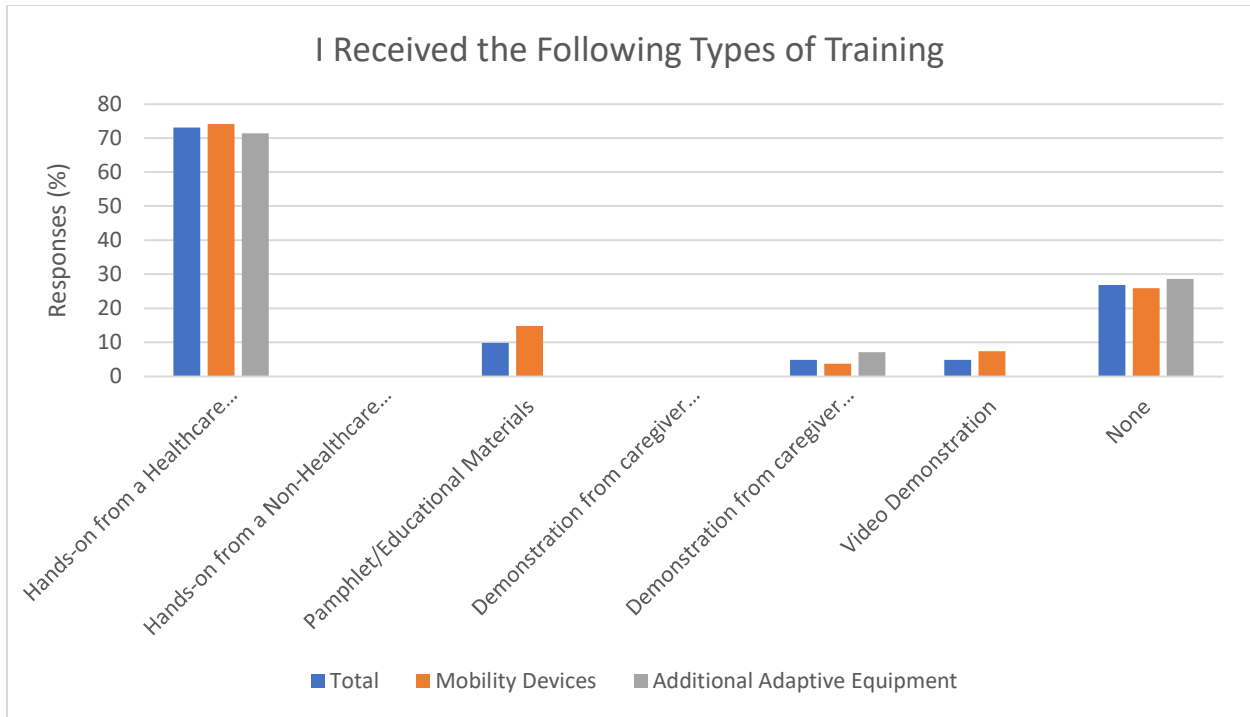


Figure 9: “I Received the Following Types of Training” Responses from Device Type

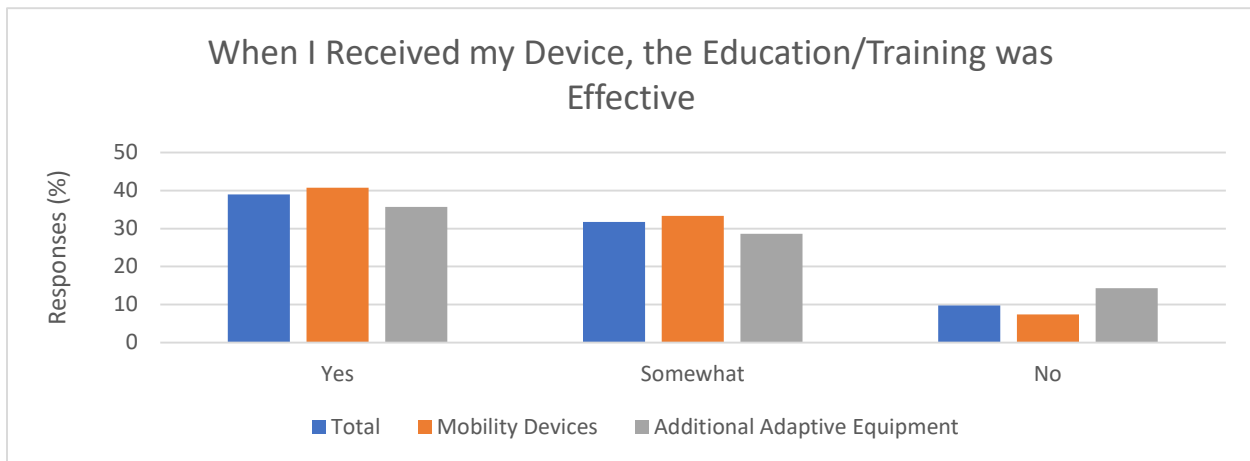


Figure 10: “When I Received my Device, the Education/Training was Effective?” Responses from Device Type

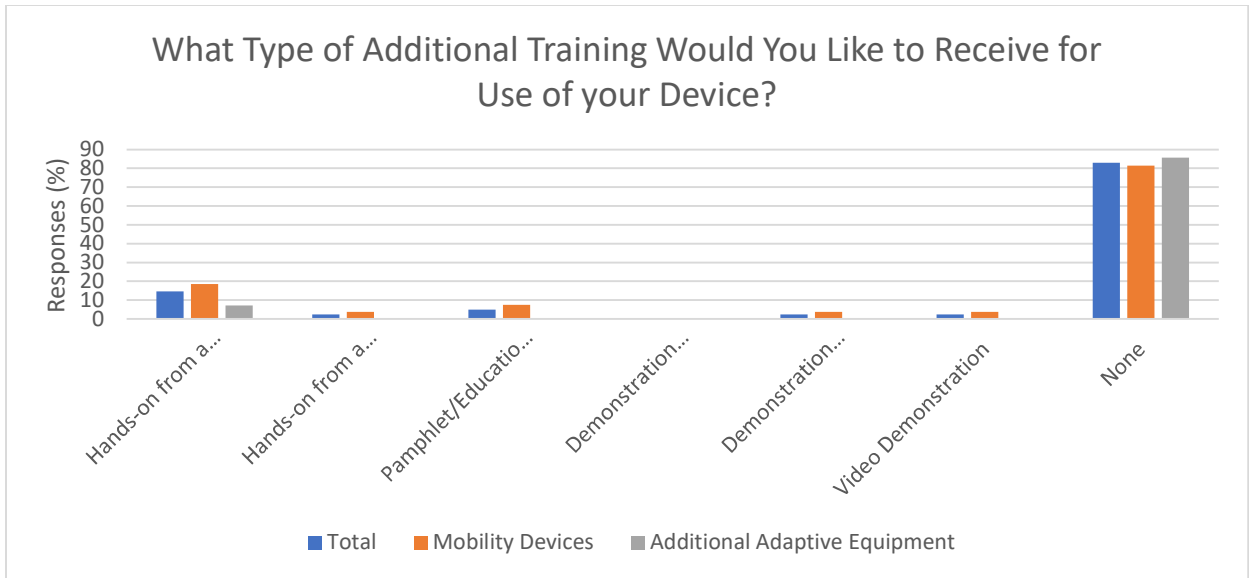


Figure 11: “What Type of Additional Training Would You Like to Receive for Use of your Device?” Responses from Device Type

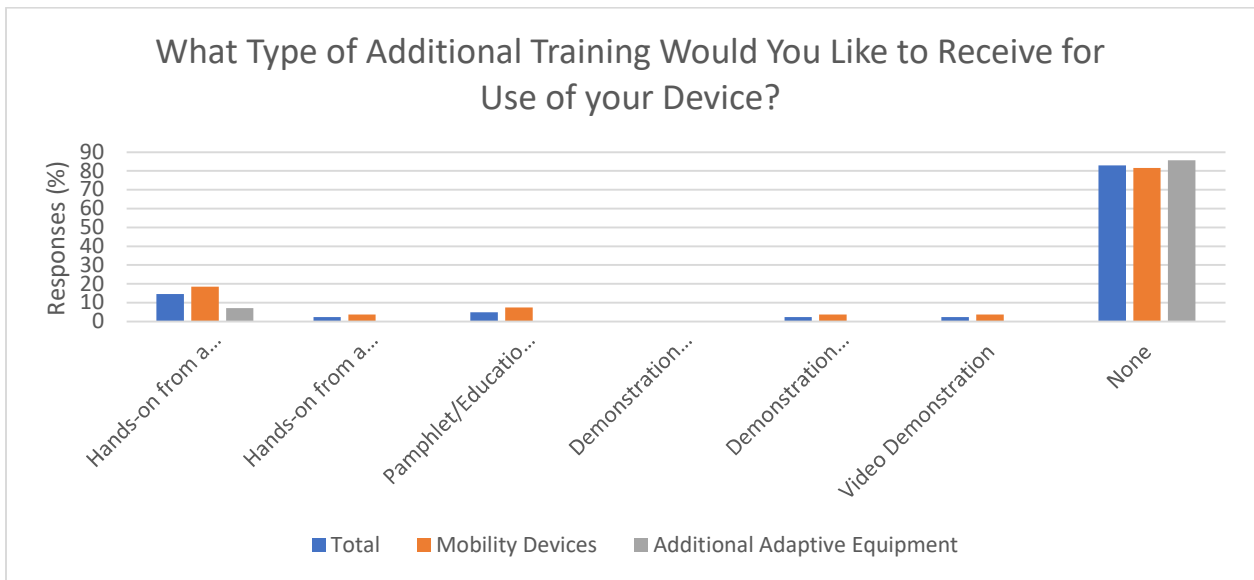


Figure 12: “What Type of Additional Training Would You Like to Receive for Use of your Device?” Responses from Device Type

Responses to “Least Useful” Devices: Based on Prevalence of Abandonment

No Longer in Use (ie. Abandoned) (n=27)

“No longer in use” was the most commonly selected answer choice regarding the prevalence of continued use of all adaptive equipment identified as “least useful.” Amongst those who identified having abandoned their equipment, the most common answer choice regarding the level of difficulty of use was “not difficult,” which is a consistent trend concerning data from the “Least Useful” sections as a whole. Likewise, “no longer needed” (81.5%) was the most common answer choice regarding factors contributing to lack of perceived usefulness, followed by “reliance on caregiver” (37%), and “uncomfortable” (25.9%).

Most participants within this group reported receiving some form of training by healthcare professionals (77.8%), whereas the remainder reported receiving none (22.2%). Regarding the perceived effectiveness of training, “yes,” training was effective (37%) was the most common answer choice. However, somewhat was a close second at (33.3%). No was the least common answer choice at 14.8%. Regarding whether or not patients who abandoned their devices felt additional training would be beneficial, “none” was the most common answer choice (n=92.6%), whereas the remaining few participants felt that additional hands-on training from healthcare professionals would be most beneficial (11.1%).

Still in Use (but not in a long time) (n=9)

“Still in use, but not in a long time” was the second most common identified answer choice regarding the prevalence of continued use. Although this group yielded a smaller sample size than the previous, more variability was present regarding participants’ responses to “level of difficulty of use.” The most commonly selected answer was “somewhat difficult” (44.4%),

which had one more response than both “not difficult” and “very difficult” (33.3%). However, similarly to data from abandoned devices and least useful devices overall, “no longer needed” (55.6%) was the most common answer choice regarding factors contributing to lack of perceived usefulness, followed by “limited by physical condition” (44.4%), and “uncomfortable” (33.3%).

Although some patients reported receiving no training on their devices (44.4%), a higher proportion of participants reported receiving some form of hands-on training from a healthcare professional. Likewise, an even distribution between those who felt training was “effective” and “somewhat effective” (33.3%) was present, and nobody felt that training was ineffective.

Regarding whether or not patients who abandoned their devices felt additional training would be beneficial, “none” was the most common answer choice (88.9%), whereas other participants felt that additional hands-on training from healthcare professionals would be most beneficial (22.2%).

Still in Use (Currently) (n=4)

“Still in Use” was the least commonly selected answer choice regarding the prevalence of continued use. The most common selected answer choice regarding difficulty of use for this group was “very difficult” (50%), compared to “not difficult” and “somewhat difficult” (25% each) as well as “impossible,” which received 0 responses. Regarding factors contributing to the perceived lack of usefulness of their device, “limited by physical condition” (50%) was the most commonly chosen answer.

Referring to the training received for device use, all participants reported receiving hands-on training from a healthcare professional, and a majority of participants claimed this training was effective (75%) vs one respondent who noted training was “somewhat” effective.

No one said training was ineffective. Regarding the desire for additional training, an even distribution was present between “hands-on from a healthcare professional” and “none” (50%)

Comparison

Regarding the effectiveness of training, the “no longer in use” group yielded results most closely aligned with results within the “Least Useful” data as a whole. Based on findings, an inverse relationship was present regarding perceived difficulty of use and prevalence of abandonment (the higher the reported prevalence of abandonment, the lower the perceived difficulty of use). This could imply that those who continue to use their “least useful” devices have not yet found a better solution, and that the difficulty of use may be influenced by other factors.

Regarding the factors contributing to the lack of perceived usefulness of these devices, results within both the “no longer in use” and “still in use, but not in a long time” groups yielded similar results to the “least useful” data in its entirety, with “no longer needed” being the most common chosen answer. However, results from the “still in use” group highlighted other factors influencing their opinion regarding their least useful devices, as “no longer in use” was not an appropriate option for this group.

Regarding training received, each group identified receiving “hands-on training from a healthcare professional” as the most common answer choice. However, feelings towards the effectiveness of training differed between groups. “Yes,” training was effective, was the most common chosen answer for all groups except for those in the “still using, but not in a long time” group, who had an even distribution between “yes” and “somewhat.” Additionally, the “no longer in use” group was the only group to report that training was ineffective. With this being

said, the data from both “no longer using” and “still using, but not in a long time” correlates directly with the “Least Useful” data as a whole, with a majority stating “none” and a few stating receiving “hands-on training from a healthcare professional” would be beneficial. However, those within the “still in use” group had an even distribution between the two answers.

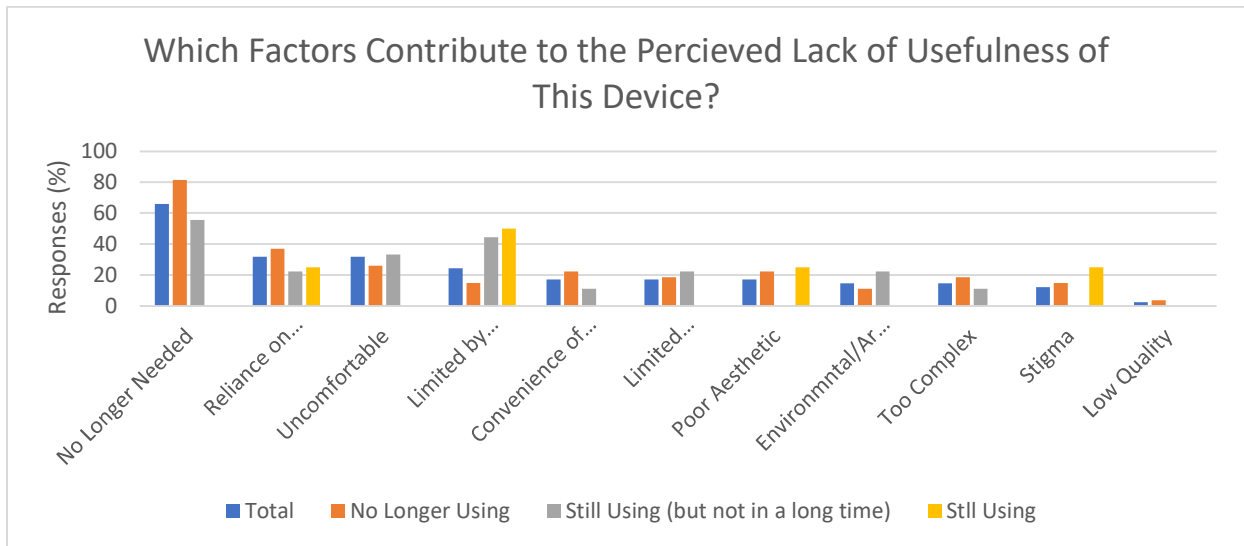


Figure 13: “Which Factors Contribute to the Perceived Lack of Usefulness of This Device?”

Responses from Prevalence of Continued Use

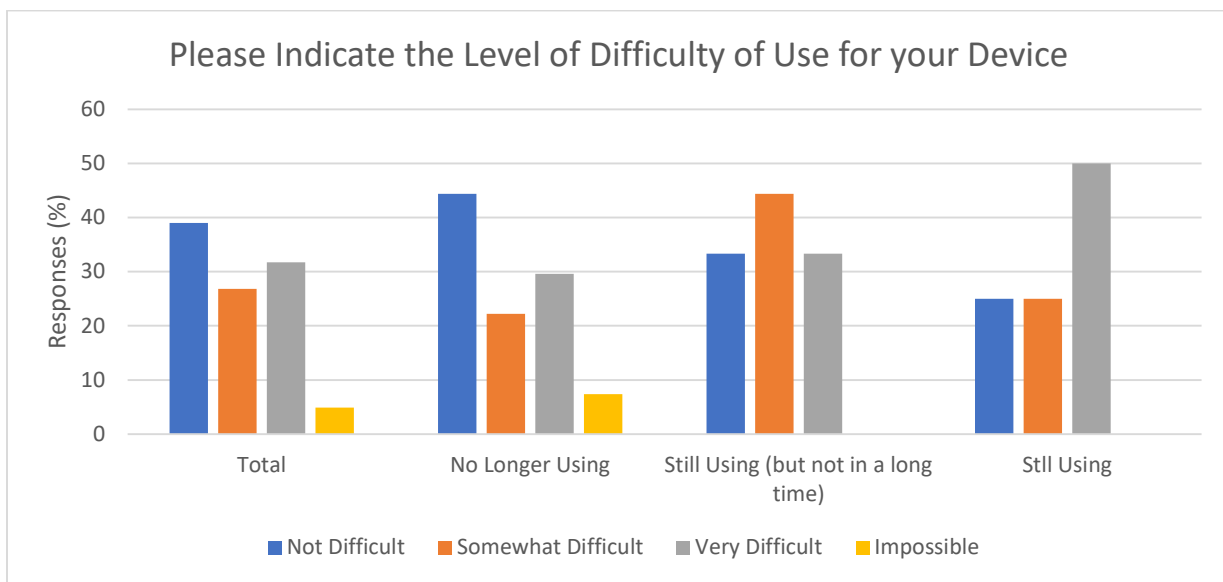


Figure 14: “Please Indicate the Level of Difficulty of Use for your Device” Responses from Prevalence of Continued Use

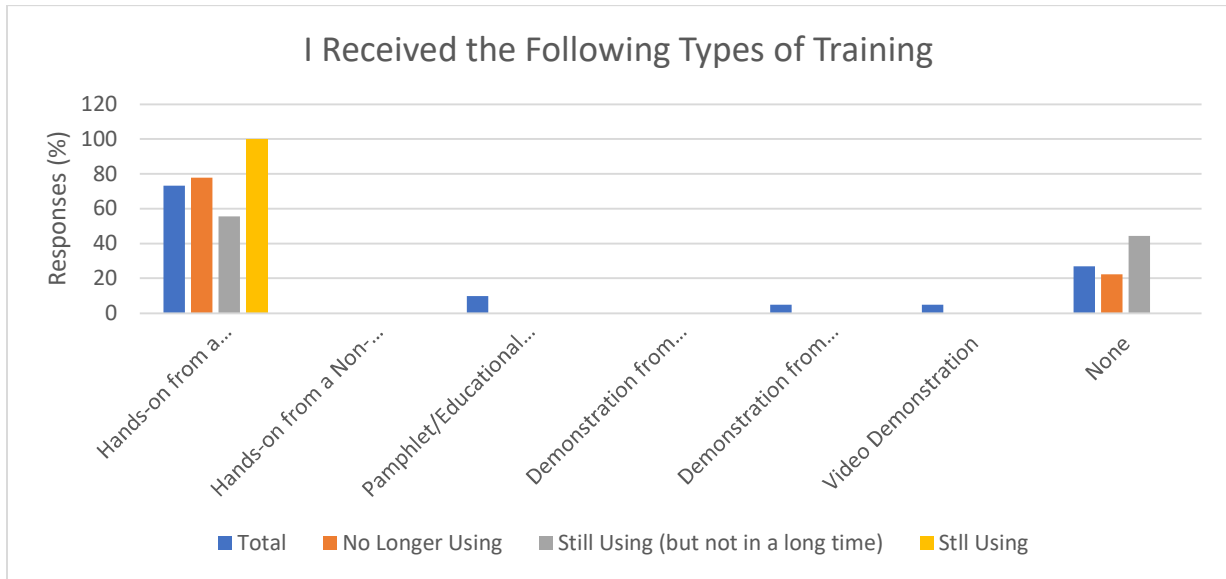


Figure 15: “I Received the Following Types of Training” Responses from Prevalence of Continued Use

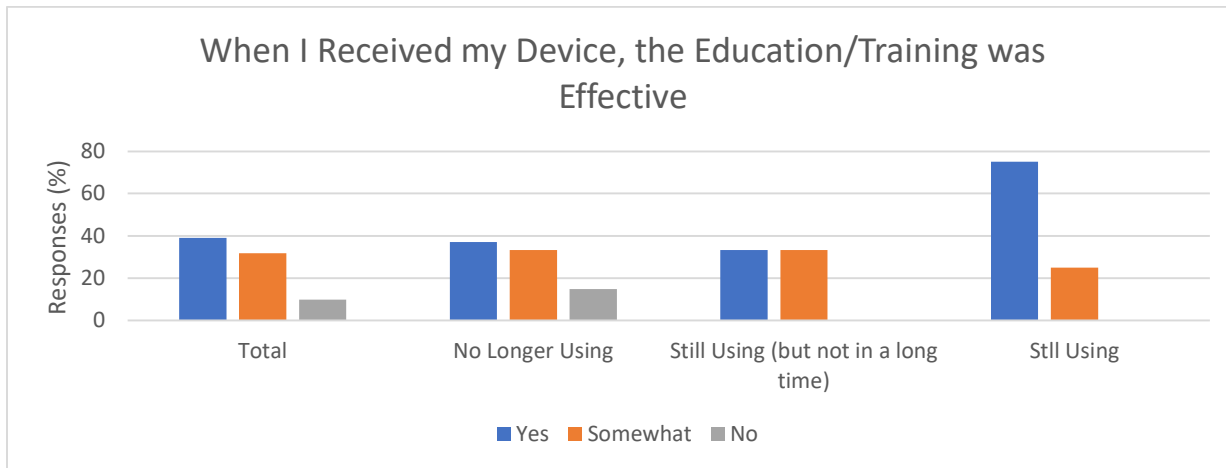


Figure 16: “When I Received my Device, the Education/Training was Effective” Responses from Prevalence of Continued Use

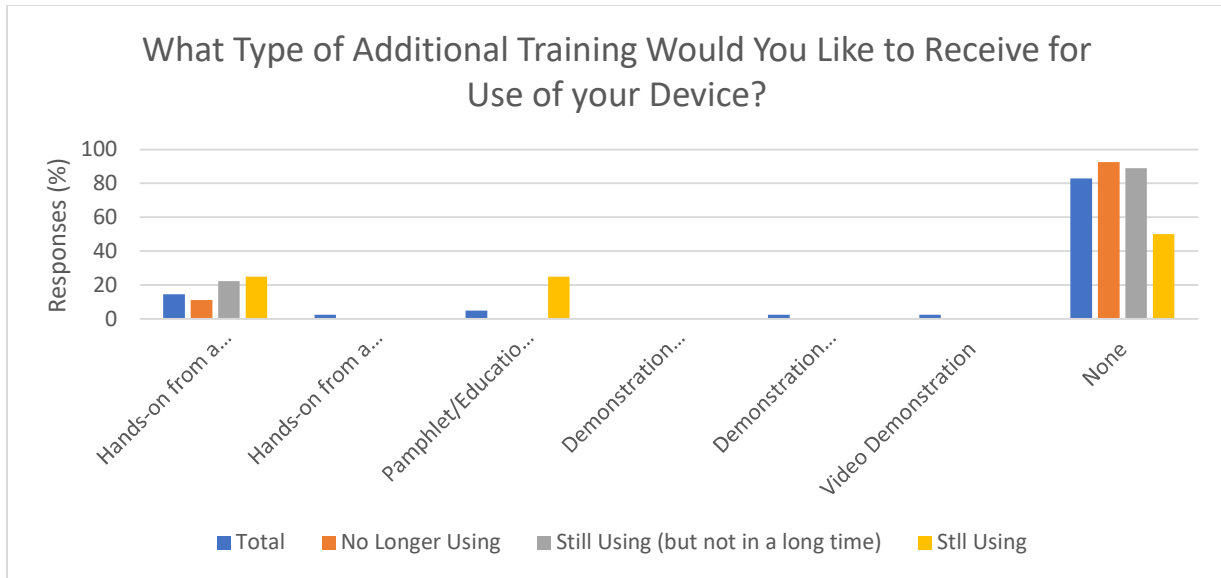


Figure 17: “What Type of Additional Training Would You Like to Receive for Use of your Device?” Responses from Prevalence of Continued Use

Informal Analysis

Based on feedback from participants and informal assessment of the data collection process, participants seemed to respond well to the survey in terms of satisfaction with participation. The final version of the AEFPP survey tool was structured to allow participants to respond only to sections that were relevant to the participant, so participants were satisfied with the fact that questions were personally tailored to their equipment. Participants also claimed to be satisfied with being provided the chance to elaborate on the variety of personal, environmental, and contextual factors that influence their opinions and satisfaction regarding the use of their adaptive equipment.

Chapter 6: Discussion

Contextualization

Abandonment

The prevalence of abandonment of devices that participants identified as their “least useful” pieces of adaptive equipment was 65.8% based on reported responses within the study. However, this does not account for devices identified as “most useful,” as it was assumed these devices were either still in use or were no longer needed. Regardless, the reported findings are consistent with existing scholarly literature, where the prevalence of abandonment of adaptive equipment overall was reported between 20% and 70% (Howard et al., 2020).

Factors Influencing Usage for Adaptive Equipment at Risk for Abandonment

Factors identified in previous studies as influencing the continued use or abandonment of adaptive equipment were included as answer choices in the AEFPP for the question titled “Which of the following factors contributes to the (perceived) lack of usefulness of this device?” Answer choices were provided in layman’s terms to encompass a variety of personal, environmental, and contextual factors to account for the holistic needs of the individual (Noe et al., 2021). As previously mentioned, each answer choice provided was chosen at least once by at least one participant (excluding “misplaced device”). This demonstrates that each factor played a role in the abandonment of adaptive equipment to some degree, whether reflecting positively or negatively regarding their reasoning for identifying devices as “Least Useful.” These factors can be attributed to the interplay of function and disability (including body structure/function) with contextual factors (both personal and environmental) (Kearny & Pryor, 2004).

“No Longer Needed” was the most common response, demonstrating the success of Adaptive Equipment to increase function and participation in daily activity throughout the users’ rehabilitation process. This implies that abandonment or risk of abandonment may be attributed to improved health (Howard et al., 2022). However, this claim cannot be made definitively, as it can also be assumed that those who “no longer needed” their devices may have found a solution that better matches function and disability with unique contextual factors. Regardless, this implies that a match between functioning/disability and contextual factors was made throughout the rehabilitation process as outlined in the ICF (Kearny & Pryor, 2004) Upon further analysis, the only subgroup that did not identify this factor as the primary reason for perceived lack of usefulness was not the most common answer were those who were “Still using” their “Least Useful” adaptive equipment.

The remainder of factors serve to highlight not only the unique personal, environmental, and contextual factors related to the use of AE, but also demonstrate the need to consider a variety of these factors and the interplay between these factors to account for the holistic needs of the individual (Noe et al., 2021).

Equipment suitability was identified in the literature as a main contributor to the rate of use of adaptive equipment (Kraskowsky & Finlayson, 2001). The answer choice “Uncomfortable” falls under this category, demonstrating a mismatch between body and device structure. “Limited Accessibility of Tools/Features” falls under this category as well, as it demonstrates the mismatch between body structure/function and device structure/function. Additionally, “Low Quality” was identified separately within the literature as playing a role in the continued use of adaptive equipment (Cruz & Emmel, 2016) due to device structure/function having an impact on participation. However, device quality could be due in large part to overall

satisfaction with device use, including personal opinions and preferences. “Poor Aesthetic” and “Stigma” serve to highlight the mismatch between personal wants/preferences with device structure (Cruz & Emmel, 2016).

Other options serve to highlight the lack of environmental supports and resources in combination with other personal and contextual factors, such as “Environmental/Architectural Barriers” (Cruz & Emmel, 2016). The answer choice titled “Reliance on Caregiver” could be attributed to reliance on caregivers being perceived as inconvenient or due to the lack of support present. Similarly, “Convenience of Size/Weight for Storage/Transportation” may be explained by the complex interaction of the individual’s context/level of function with these societal or environmental barriers (Howard et al., 2022).

The remaining factors that were identified within the study, “too complex” and “limited by physical condition,” can be attributed to a mismatch between a variety of factors, including the device itself, the individual, and the healthcare context, and environmental barriers (Howard et al., 2022). However, user perception regarding self-efficacy plays a large role in the perception of device use, which should be considered when using the AAFP as a tool for the prescription and implementation of adaptive equipment (Sugawara et al., 2018).

New Insights

Referring to results from the “Least Useful” section as a whole, most participants identified that they: 1. had abandoned their device, 2. perceived device use as “not difficult,” 3. have received training (to which a majority of participants reported was effective to some degree), and/or 4. no longer needed their device or desired any additional training. With this being said, it can be inferred that many who view their devices as “Least Useful” OR have abandoned their devices have either done so due to progressing through their rehabilitation

experience (and onto more appropriate, potentially less invasive equipment) or through the implementation of a solution that worked better to address personal, environmental, and contextual factors. However, this generalization was not the case for every participant, as a variety of responses were influenced by outstanding factors.

Individual responses could be attributed to the unique interplay between function and disability (including body structure/function) and contextual factors (both personal and environmental) (Kearny & Pryor, 2004). Factors such as device type and prevalence of abandonment were analyzed separately to reflect differences among responses. Although responses in the “Mobility Devices” section yielded higher levels of variability compared to responses within the “Additional Adaptive Equipment” section, there was little variability between trends and common answers for each question between both sections. This makes sense as the survey was structured to target the use of adaptive equipment overall. However, groups based on the prevalence of abandonment yielded trends and frequencies of responses to inconsistent with each other, indicating that the prevalence of use may have a larger impact on feelings and attitudes towards devices versus device type.

It is also hypothesized, based on prior research, that despite training received and the effectiveness of training, patients' responses and attitudes may have depended heavily on participants' recovery and where they stood regarding their progression throughout the rehabilitation process. Adequate training was identified in multiple studies as a potential factor leading to the abandonment of adaptive equipment (Cruz & Emmel, 2016; Kraskowsky & Finlayson, 2001). Likewise, using a holistic approach to involve patients in the rehabilitation process (considering patients' desires, priorities, and other personal factors) was shown to decrease the likelihood of device abandonment (Howard et al., 2022; Kinney, 2016). Lack of

resource monitoring by a healthcare professional was additionally shown to increase the likelihood of abandonment (Cruz & Emmel, 2016), indicating a need for constant follow-up throughout the adaptive equipment implementation process.

Limitations

Although this study successfully identified, evaluated, and provided rationales regarding the impact of personal, environmental, and contextual factors on the perceived usefulness and abandonment of adaptive equipment, limitations were present throughout the study. The largest limiting factor to establishing significance among findings was the relatively small sample size of participants. Although reported data was based on the combination of “Least Useful” responses overall (total of 41 responses), all other subgroups received $n < 30$ responses. This was due to the structure of the survey, which allows participants to respond to sections that applied to their history of and experience with device use. For example, only four participants identified as “still using” their “Least Useful” adaptive equipment, which negatively impacted the ability to generalize findings to an entire population. However, comparisons of results from each subsection allowed us to hypothesize why device type or prevalence of abandonment may influence the remainder of the responses.

In addition to a small sample size, multiple forms of biases were present during the AEFPP implementation process. Confirmation bias was present due to utilizing previously researched topics and factors that may have an impact on device use and perception of device use. The option for “other” was presented for questions regarding these factors and training, but none of the responses given were relevant to the question itself, so the data was ignored. Response bias was present as well, particularly regarding the effectiveness of training. Most participants responded that training was either effective or somewhat effective. Based on other responses

regarding device use, it can be hypothesized that participants responded positively to this question due to the presence of the person providing training on these devices (in this case, therapists). Finally, interviewer bias was present, as the way questions were presented to patients was conducted differently depending on cognitive, emotional, or verbal deficits. Oftentimes, the survey was administered to family or caregivers of patients who met all the inclusion criteria due to these factors, where they were asked to provide answers regarding personal factors and opinions to the best of their ability. However, interviews were only completed with family or caregivers if they worked closely enough with the participant to accurately answer these questions. Recall bias was also present when requiring patients to recall certain factors related to training, as often these participants could not remember what form of training was received, as these events may have happened long ago and/or often amid a traumatic situation, such as a brain injury or stroke.

Lastly, it was stated previously that responses and attitudes may depend heavily on participants' recovery and where they stood regarding their progression throughout the rehabilitation process. This could suggest the AEFPP may be of better use as a true "follow-up" protocol rather than an evaluative tool (for which it was utilized in this study) to track patients' progress and experience with multiple types of adaptive equipment.

Future Directions

To expand on findings and address the limitations highlighted throughout the study, proposals were presented to guide future research regarding the use of the AEFPP to accurately identify unique personal, environmental, and contextual factors that influence the use of AE to increase functional use and prevent abandonment of equipment. To better understand what promotes the abandonment of adaptive equipment, further research could focus on distinguishing

between groups of those who no longer use their devices due to no longer needing them (as a result of progression through the rehabilitation process) versus those who abandoned their devices due to a misfit between personal and contextual factors related to functioning and disability. This knowledge could help inform healthcare professionals to provide the best-fitting devices for their patients based on individual needs and preferences.

The study would additionally benefit from a larger sample size to conduct a more in-depth analysis regarding the influence of different forms of adaptive equipment (Mobility Devices vs Additional AE). Regarding the wording of questions and answer choices within the AEFPP survey, it may be beneficial to reword questions into layman's terms to decrease the amount of interview bias present. Additionally, the inclusion of more open-ended questions may reduce the risk of confirmation bias. Lastly, a longitudinal study may be necessary to further explore the provision, training processes, progress, and overall experience with multiple forms of adaptive equipment over time to draw accurate conclusions regarding the effectiveness of the AEFPP as an effective follow-up protocol in promoting continued use of AE with patients.

Chapter 7: Implications for Occupational Therapy Practice

Findings from this research/survey implementation study serve to contribute to the field of Occupational Therapy by highlighting and exploring the relationships between personal, environmental, and contextual factors unique to individuals who utilize adapted equipment to increase participation and engagement with daily activity.

Existing research was utilized to identify commonly identified factors that may increase the likelihood of abandonment. This research study discusses the interplay (and inferred mismatch) of function and disability (including body structure and function) with personal and environmental factors, which may influence users' overall experience with their adaptive equipment. Each of these factors identified within the literature and presented within the survey were broken down using the International Classification of Function (ICF) to determine how this mismatch was presented. This provides Occupational Therapists and other healthcare professionals with a deeper understanding of what may be promoting these factors and inhibiting the functional use of appropriate adaptive equipment.

Results were analyzed to establish which factors most commonly contributed to the lack of perceived usefulness and/or abandonment of adaptive equipment. In addition, relationships established between certain factors (such as device type and prevalence of abandonment) provide a holistic view of the combination of factors that may influence abandonment. These factors and the relationships between them can be utilized in clinical practice to inform weaknesses in the implementation and provision of adaptive equipment across the rehabilitation process. This allows healthcare professionals to address these weaknesses and match individuals to appropriate devices based on their wants and needs to ultimately decrease the likelihood of abandonment.

Finally, once adapted to reflect the revisions proposed in the “Future Directions” section of my methods, the Adaptive Equipment Follow-Up protocol allows Occupational Therapists and other healthcare professionals alike to assess and track users’ experience with and opinions on their adaptive equipment. The AEFU utilizes a holistic, person-centered approach to identify the unique factors that play a role in the continued use or abandonment of adaptive equipment so that clinicians can ultimately maximize the functional use of adaptive equipment for engagement in daily activity while subsequently decreasing the likelihood that these devices become abandoned. Regular implementation of this protocol gives clinicians an inside view not only to these factors, but also to how these factors change over time.

Chapter 8: Sustainability Plan or Implementation Plan

Findings from this study will be used in the future to support ongoing research regarding factors influencing the abandonment of adaptive equipment. Additionally, findings will support ongoing research intended to inform the identification and inclusion of personal factors within the ICF. The study will be submitted to a professional journal for publication as a research article, as well as posted to state- and national-level Occupational Therapy organizations' websites (GOTA and AOTA), to promote the awareness and importance of the consideration of these findings.

Additionally, findings were used to support the creation and revision process of a helpful tool for occupational therapists to use with their patients to decrease the likelihood of abandonment. The Adaptive Equipment Follow-Up Protocol survey tool can be utilized by healthcare workers to track progress and assess functional use of adaptive equipment using a holistic approach to account for a variety of personal, environmental, and contextual factors that may influence functional use. The survey tool is intended to be used by occupational therapists. However, it can be utilized by any healthcare professional who works with patients who utilize adaptive equipment to increase engagement in daily activities. No additional training is required to conduct the survey.

Chapter 9: Conclusions

Multiple factors influencing the perceived lack of usefulness or abandonment of adaptive equipment were identified throughout the development and implementation of the Adaptive Equipment Follow-up Protocol (AEFP) survey tool. These included: no longer needed, reliance on caregiver, uncomfortable, limited by physical condition, convenience of size/weight for transportation, limited accessibility of tools/features, poor aesthetic, environmental/architectural barriers, too complex, and stigma. The remainder of the responses yielded values of $n < 2$, so these were not included within the analysis portion of this study.

“No longer needed” was the most common answer choice for devices identified as “least useful” overall. In addition, most participants identified that they were “no longer using” their devices. Regarding the perceived level of difficulty, responses were variable. However, “not difficult” was the most commonly selected answer choice. Regarding training, a majority of participants claimed they received hands-on training from a healthcare professional, which was effective to some degree. Likewise, a majority of participants identified that they would not benefit from additional training. With this being said, it can be inferred that most respondents who identified a “least useful” device had either progressed out of their devices throughout the rehabilitation process or discovered a new solution for a better fitting device.

Although these were the most common identified responses, responses were shown to be highly attributed to the unique interplay of functioning and disability with personal, environmental, and other contextual factors. Consideration of these factors and relationships between them can be used to help define and predict an individual’s attitudes and experience with adaptive equipment to effectively close the gap between what is known to cause abandonment. Additionally, the analysis of responses based on device type and prevalence of

device use (ie, abandonment) was used to further define these relationships and predict factors related to abandonment. Other factors, such as progression through the rehabilitation process, should be considered upon further research and implementation of the AEFPP.

Additionally, the AEFPP survey can serve as a helpful tool for Occupational Therapists and other healthcare professionals to assess and track their patients' overall experience with their adaptive equipment using a holistic, person-centered approach to identify and better understand these unique factors contributing to the perceived lack of usefulness of necessary adaptive equipment. When utilized effectively, the survey tool can be used to predict and address these factors to ensure the maximization of functional use of adaptive equipment and improve patients' overall quality of life. A longitudinal study using a larger sample size could be utilized in future research to improve the effectiveness of the survey to identify factors and relationships related to the abandonment of adaptive equipment.

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Appendix 1 - Learning Objectives

Goal 1: Implement and revise an online survey, the Adaptive Equipment Follow-Up Protocol (AEFP), to assess user satisfaction with personal adaptive equipment.

- Learning Objective 1a: Administer the initial version of the Adaptive Equipment Follow-Up Protocol
 - Action Steps:
 - Partner with an outpatient neuro-rehabilitation clinic (Rehab Without Walls) to implement with patients receiving OT/PT who meet the inclusion criteria for the study. Take notes and engage in formative assessments to brainstorm potential revisions to AEFP survey.
 - Expected Outcomes/Results
 - Determine changes that must be made to improve overall effectiveness clarity of survey
- Learning Objective 1b: Evaluate the effectiveness of the Adaptive Equipment Follow-Up Protocol, making necessary revisions to enhance clarity, validity, and relevance.
 - Action Steps
 - Refer to findings from initial implementation of the AEFP, along with user feedback, supporting literature, notes and self-reflections, and feedback from supervisors to make necessary revisions.
 - Expected Outcomes/Results

- Effectively adapt and revise the AEFP survey to better address personal factors related to the continuance or discontinuance of all types of adaptive equipment among participants.
- Learning Objective 1c: Implement the revised version of the Adaptive Equipment Follow-Up Protocol
 - Action Steps
 - Partner with 2 outpatient neuro-rehabilitation clinics (Rehab Without Walls and Rehab and Beyond) to implement with patients receiving OT/PT who meet the inclusion criteria for the study. Continue taking notes and engaging in formative assessments throughout survey implementation to support project dissemination and publication.
 - Expected Outcomes/Results
 - Utilize results to support my final write-up for my Doctoral Capstone Experience, as well as publication of the AEFP to serve as a tool for healthcare professionals to better understand the unique personal factors either supporting or hindering effective use of AE to prevent abandonment of equipment.

Goal 2: Increase my knowledge and understanding of the personal factors leading to the continued use or abandonment of adaptive equipment through scholarly research and data analysis to provide recommendations for future implementation.

- Learning Objective 2a: Identify and evaluate personal factors that influence the continued use or abandonment of adaptive equipment
 - Action Steps
 - Engage in an in-depth review of the scholarly literature. Identify a model (International Classification of Functioning, ICF) to support protocol implementation and project dissemination. Continue to self-reflect and engage in formative analysis throughout data collection
 - Expected Outcomes/Results
 - Identify and summarize at least 15 articles related to the ICF and/or factors leading to the continuance or discontinuance of adaptive equipment.
- Learning Objective 2b: Analyze data to identify trends within data to better understand the unique personal factors leading to the continued use or abandonment of adaptive equipment
 - Action Steps:
 - Identify trends within individual participants' responses, as well as responses to individual questions amongst all participants.
 - Expected Outcomes/Results
 - Use findings to support final write-up and provide a deeper understanding of the commonly identified personal factors influencing the use or disuse of adaptive equipment.

- Learning Objective 2c: Synthesize research and data analysis to provide recommendations for publication and future clinical implementation of the AEFP.
 - Action Steps
 - Engage in statistical analysis to objectively assess patients' responses to the survey, utilizing frequencies and trends to support understanding and final write-up.
 - Expected Outcomes/Results
 - Develop and publish the final version of the AEFP as a tool for healthcare professionals to utilize with patients who use adaptive equipment.

Goal 3: Increase competence in my capstone experience and improve my knowledge and understanding of the research process by the end of my Doctoral Capstone Experience

- Learning Objective 3a: Develop a deeper understanding of research methodologies, data collection, and analysis techniques to support my Capstone Experience.
 - Action Steps
 - Continuously engage in data collection and scholarly research to support my project and improve my clinical research skills.
 - Expected Outcomes/Results
 - Produce a finalized project supported by scholarly research and best practices.

- Learning Objective 3b: Demonstrate professional growth by reflecting on and assessing personal progress in research competency and capstone execution, identifying strengths and areas of improvement
 - Action Steps
 - Engage in weekly self-reflection and continuously reassessing goals and goal achievement. Building connections with local clinics to support my project and the field of Occupational Therapy as a whole.
 - Expected Outcomes/Results
 - Improve self-awareness, goal-setting skills, networking, and overall autonomy skills as I begin my journey and contribution to the field of Occupational Therapy.
- Learning Objective 3c: Integrate scholarly research and professional practices to support informed decision-making for project development and dissemination.
 - Action Steps
 - Continue to demonstrate professionalism and evidenced-based practice as I represent Georgia State's Occupational Therapy program, as well as myself as a future practicing clinician.
 - Expected Outcomes/Results
 - Develop a well-rounded project that supports and contributes to my GSU's OT program and the profession of Occupational Therapy overall.

Appendix 3 - Summary Pages

Problem

Abandonment of adaptive equipment (AE) is a growing problem among the disabled population, particularly among those who rely on their devices to enhance independence by maximizing safety, promoting social inclusion, and increasing participation in daily activity and in society (Howard et al., 2020). Abandonment of AE can often be linked to diminished client satisfaction with equipment as a consequence of a lack of fit between users, their assistive products, and their environment (Sugawara, 2018; Kraskowsky & Finlayson, 2001). Consideration of users' individual experiences, including their desires, priorities, and opinions regarding their equipment, independence, and engagement in society, is necessary when prescribing and implementing AE to minimize the risk of discontinuation (Cruz and Emmel, 2016).

Purpose

The purpose of this study was to identify, highlight, and explore the relationships between personal, environmental, and contextual factors unique to individuals who utilize adapted equipment to increase participation and engagement with daily activity to prevent abandonment of their devices.

Specific Aims

My first specific aim and primary goal of my Capstone project was *to implement a follow-up protocol to assess user satisfaction with their adaptive equipment*. The Adaptive Equipment Follow-up Protocol (AEFP) was implemented 5 days a week for 3 weeks using an online survey (via Qualtrics) with users of adaptive mobility devices. I paired with multiple

outpatient therapy clinics to implement the AEFPP with patients with varying functional capabilities who rely on mobility-related AE to participate in meaningful daily activities. Implementation of the AEFPP aimed to improve the understanding of unique client-centered factors in the prescription and implementation of AE, as well as refine a useful tool for healthcare professionals to use with patients to prevent equipment abandonment. Formative assessments were utilized throughout program implementation to refine the contents of the protocol and intervention techniques as necessary.

My second specific aim served as a subsequent goal to the primary objective of program implementation. *I used data analysis to provide results and create recommendations for the AEFPP to support future protocol implementation by the end of my capstone experience.* I administered the AEFPP using the Qualtrics online survey tool and collected qualitative data to establish validity of the protocol based on response frequencies and trends using descriptive statistics. In conjunction with ongoing research and review of the existing literature, I used these conclusions to create future recommendations and adapt the protocol itself, as well as emphasize the importance of considering unique client-centered factors when utilizing AE as an intervention to maximize functional equipment use and prevent abandonment.

My third specific aim was more specific to the research process and my Capstone project as a whole. *I increased competence in my capstone experience and improved my knowledge and understanding of the research process by the end of my doctoral capstone experience.* To complete this goal, I documented progress using weekly self-reflections throughout the entirety of the doctoral capstone experience, including research, program implementation, data analysis, and project dissemination. These reflections serve as formative self-assessments to allow me to analyze and determine best practices to guide my Capstone experience.

My last aim serves in conjunction with my previously mentioned objective: *I improved my knowledge of the continuance or discontinuance of adaptive equipment by the end of my capstone experience.* I utilized existing literature to expand my knowledge of the abandonment of AE and the importance of consideration of unique client-centered factors, while also accounting for results from protocol implementation, to create and adapt the AEFP. My third and fourth specific aims partially served as preliminary goals to the implementation of the AEFP to support effective clinical practices and considerations, while also allowing personal improvement of my independent clinical and research skills.

Outputs

The project refined and established a valid protocol to assess users' desires, priorities, and opinions about AE to maximize the functional use of equipment and decrease levels of abandonment. Personal feedback and data regarding the effectiveness of protocol implementation was analyzed to establish the validity of this protocol, as well as create recommendations for future implementation based on findings.

Outcomes

The AEFP highlights the unique factors that may influence the continued use or abandonment of different types of adaptive equipment. Findings from data implementation, in combination with an extensive review of scholarly literature, served to inform healthcare professionals of potential risk factors for the abandonment of necessary adaptive equipment. The AEFP additionally served as a helpful evaluative tool for healthcare professionals in guiding the prescription and implementation of adaptive equipment.

FINAL Adaptive Equipment Follow-Up Protocol (AEFP)

Mobility Devices

Q1 What type(s) of mobility device(s) do you use or have you used in the past in your home and/or community?

- Manual Chair
 - Power Chair
 - Walker
 - Canes
 - Crutches
 - Braces / Orthotics
 - Mobility Scooter
 - Ramps
 - Handrails / Grab bars
 - Stairlift
 - Other (please specify): _____
-

Q2 Out of all mobility devices identified, please identify which device you perceive as the **most useful** device regarding your participation in daily activities. NOTE: If only one device was identified and is currently still in use, please list it here. If none were identified, please skip this question and the corresponding sections.

Q3 Out of all mobility devices identified, please identify which device you perceive as the **least useful** regarding your participation in daily activities. NOTE: If only one device was identified and is not currently in use, please list it here. If none were identified, please skip this question and the corresponding sections.

Mobility Device: Most Useful

*Please answer the following questions regarding the piece of mobility equipment you identified as **most useful**. NOTE: If only one device was identified and is currently still in use, please answer the following questions in this section based on this device.*

Q4 How long have you used your device?

- 1 year or less
- 2-3 years
- 4-5 years
- 6+ years

Q5 How often do you use your device?

- 1 hour per day or less
 - 2-3 hours per day
 - 4-5 hours per day
 - 6+ hours per day
-

Q6 On an average day, do you typically use your identified device to engage in any task involved in the following activities? Select all that apply:

- Bathing (washing, drying, etc.)
 - Dressing (threading, balancing, etc.)
 - Toileting (bowel/bladder)
 - Preparing, participating in, and/or cleaning up meals
 - Personal hygiene (brushing teeth/hair, washing face, etc.)
 - Household chores (cleaning, etc.)
 - Transferring (i.e. getting in/out of bed, getting up from a chair)
 - Moving around the home on the same level
 - Moving around less stable surfaces (grass, etc.)
 - Moving up/down the stairs
 - Other (please specify): _____
-

Q7 For the following aspects of your device, please indicate...

Usability / Complexity	<input type="radio"/> Difficult to use	<input type="radio"/> Neutral	<input type="radio"/> Easy to use
Fit / Comfortability	<input type="radio"/> Uncomfortable	<input type="radio"/> Neutral	<input type="radio"/> Comfortable
Durability	<input type="radio"/> Not durable	<input type="radio"/> Neutral	<input type="radio"/> Durable
Maneuverability	<input type="radio"/> Difficult	<input type="radio"/> Neutral	<input type="radio"/> Easy
Accessibility (of tools & features)	<input type="radio"/> Difficult to access	<input type="radio"/> Neutral	<input type="radio"/> Easy to access
Size / Weight (for storage & transportation)	<input type="radio"/> Difficult to manage	<input type="radio"/> Neutral	<input type="radio"/> Easy to manage
Aesthetic	<input type="radio"/> Unattractive	<input type="radio"/> Neutral	<input type="radio"/> Attractive
Overall	<input type="radio"/> Dissatisfied	<input type="radio"/> Neutral	<input type="radio"/> Satisfied

Q8 I received the following types of training: (Select all that apply)

- Hands-on from healthcare professional
 - Hands-on from non-healthcare professional
 - Pamphlet/educational material(s)
 - Demonstration from caregiver (unpaid/family)
 - Demonstration from caregiver (paid)
 - Video Demonstration (or other online educational resources)
 - None
 - Other (please specify): _____
-

Q9 When I received my device, the education/training (self-education included) was effective.

- Yes
 - No
 - Somewhat
 - N/A
-

Q10 If applicable, what type of additional training would you like to receive for use of your device?
Select all that apply:

- Hands-on from healthcare professional
- Hands-on from non-healthcare professional
- Pamphlet/educational material(s)
- Demonstration from caregiver (unpaid/family)
- Demonstration from caregiver (paid)
- Video Demonstration (or other online educational resources)
- None
- Other (please specify): _____

Mobility Device: Least Useful

*Please answer the following questions regarding the piece of mobility equipment you identified as **least useful**. NOTE: If only one device was identified and is **not** currently still in use, please answer the following questions in this section based on this device.*

Q11 Do you still use your equipment?

- Yes
 - Yes, but not in a long time
 - No
-

Q12 On an average day, for which activities do/did you typically use your device in your home/community?

- Bathing (washing, drying, etc.)
 - Dressing (threading, balancing, etc.)
 - Toileting (bowel/bladder)
 - Preparing, participating in, and/or cleaning up meals
 - Personal hygiene (brushing teeth/hair, washing face, etc.)
 - Household chores (cleaning, etc.)
 - Transferring (i.e. getting in/out of bed, getting up from a chair)
 - Moving around the home on the same level
 - Moving around less stable surfaces (grass, etc.)
 - Moving up/down the stairs
 - Getting in and out of cars
 - Other (please specify): _____
-

Q13 Please rate the level of difficulty regarding the useability of equipment.

- Not difficult at all
 - Somewhat difficult
 - Very difficult
 - Impossible
-

Q14 Which of the following factors contributes to the lack of usefulness of device regarding participation in daily activities?

- No longer needed
 - Limited by physical condition
 - Too complex
 - Uncomfortable
 - Low quality
 - Environmental / architectural constraints
 - Stigma
 - Reliance on caregiver
 - Limited accessibility (of tools/features)
 - Convenience of size / weight (for storage/transportation)
 - Poor aesthetic
 - Other _____
-

Q15 Select all that apply; I received the following types of training:

- Hands-on from healthcare professional
 - Hands-on from non-healthcare professional
 - Pamphlet/educational material(s)
 - Demonstration from caregiver (unpaid/family)
 - Demonstration from caregiver (paid)
 - Video Demonstration (or other online educational resources)
 - None
 - Other (please specify): _____
-

Q16 When I received my device, the education/training (self-education included) was effective.

- Yes
 - No
 - Somewhat
 - N/A
-

Q17 If applicable, what type of additional training would you like to receive for use of your device?
Select all that apply:

- Hands-on from healthcare professional
- Hands-on from non-healthcare professional
- Pamphlet/educational material(s)
- Demonstration from caregiver (unpaid/family)
- Demonstration from caregiver (paid)
- Video Demonstration (or other online educational resources)
- None
- Other (please specify): _____

Additional Adaptive Equipment

Q18 What type(s) of additional adaptive equipment do you use/have you used in your home/community?

- Dressing equipment (ie. reacher, sock aid, etc.)
- Hearing equipment (ie. hearing aids, etc.)
- Visual equipment (ie. magnifiers, etc.)
- Communication equipment (ie. AAC, etc.)
- Cognitive aids (for memory, attention, reminders, etc.)
- Eating equipment (ie. adaptive utensils, etc.)
- Other (please specify): _____

Q19 Out of all equipment identified in the previous question, please identify which device you perceive as **most useful** device regarding your participation in daily activities. NOTE: If only one was identified, please list it here. If none were identified, skip this question and corresponding sections.

Q20 Out of all equipment identified in the previous question, please identify which device you perceive as **least useful** device regarding your participation in daily activities. NOTE: If no equipment OR only one piece of equipment was identified, skip this question and corresponding sections.

Additional Adaptive Equipment: Most Useful

*Please answer the following questions regarding the piece of adaptive equipment you identified as **most useful**. NOTE: If only one device was identified and is currently still in use, please answer the following questions in this section based on this device.*

Q21 How long have you used your device?

- 1 year or less
 - 2-3 years
 - 4-5 years
 - 6+ years
-

Q22 How often do you use your device?

- 1 hour per day or less
 - 2-3 hours per day
 - 4-5 hours per day
 - 6+ hours per day
-

Q23 On an average day, do you typically use your identified device to engage in any task involved in the following activities? Select all that apply:

- Bathing (washing, drying, etc.)
 - Dressing (threading, balancing, etc.)
 - Toileting (bowel/bladder)
 - Preparing, participating in, and/or cleaning up meals
 - Personal hygiene (brushing teeth/hair, washing face, etc.)
 - Household chores (cleaning, etc.)
 - Transferring (i.e. getting in/out of bed, getting up from a chair)
 - Moving around the home on the same level
 - Moving around less stable surfaces (grass, etc.)
 - Moving up/down the stairs
 - Other (please specify): _____
-

Q24 For the following aspects of your device, please indicate...

Usability / Complexity	<input type="radio"/> Difficult to use	<input type="radio"/> Neutral	<input type="radio"/> Easy to Use
Fit / Comfortability	<input type="radio"/> Uncomfortable	<input type="radio"/> Neutral	<input type="radio"/> Comfortable
Durability	<input type="radio"/> Not durable	<input type="radio"/> Neutral	<input type="radio"/> Durable
Maneuverability	<input type="radio"/> Difficult	<input type="radio"/> Neutral	<input type="radio"/> Easy
Accessibility (of tools & features)	<input type="radio"/> Easily accessible	<input type="radio"/> Neutral	<input type="radio"/> Difficult to access
Size / Weight (for storage & transportation)	<input type="radio"/> Difficult to manage	<input type="radio"/> Neutral	<input type="radio"/> Easy to manage
Aesthetic	<input type="radio"/> Unattractive	<input type="radio"/> Neutral	<input type="radio"/> Attractive
Overall	<input type="radio"/> Dissatisfied	<input type="radio"/> Neutral	<input type="radio"/> Satisfied

Q25 Select all that apply; I received the following types of training:

- Hands-on from healthcare professional
 - Hands-on from non-healthcare professional
 - Pamphlet/educational material(s)
 - Demonstration from caregiver (unpaid/family)
 - Demonstration from caregiver (paid)
 - Video Demonstration (or other online educational resources)
 - None
 - Other (please specify): _____
-

Q26 When I received my device, the education/training (self-education included) was effective.

- Yes
 - No
 - Somewhat
 - N/A
-

Q27 If applicable, what type of additional training would you like to receive for use of your device?
Select all that apply:

- Hands-on from healthcare professional
- Hands-on from non-healthcare professional
- Pamphlet/educational material(s)
- Demonstration from caregiver (unpaid/family)
- Demonstration from caregiver (paid)
- Video Demonstration (or other online educational resources)
- None
- Other (please specify): _____

Additional Adaptive Equipment: Least Useful

*Please answer the following questions regarding the piece of adaptive equipment you identified as **least useful**. NOTE: If only one device was identified and is **not** currently still in use, please answer the following questions in this section based on this device.*

Q28 Do you still use your equipment?

- Yes
 - Yes, but not in a long time
 - No
-

Q29 On an average day, for which activities do/did you typically use your device in your home/community?

- Bathing (washing, drying, etc.)
 - Dressing (threading, balancing, etc.)
 - Toileting (bowel/bladder)
 - Preparing, participating in, and/or cleaning up meals
 - Personal hygiene (brushing teeth/hair, washing face, etc.)
 - Household chores (cleaning, etc.)
 - Transferring (i.e. getting in/out of bed, getting up from a chair)
 - Moving around the home on the same level
 - Moving around less stable surfaces (grass, etc.)
 - Moving up/down the stairs
 - Other (please specify): _____
-

Q30 Please rate the level of difficulty regarding the useability of equipment.

- Not difficult at all
 - Somewhat difficult
 - Very difficult
 - Impossible
-

Q31 Which of the following factors contributes to the lack of usefulness/importance of device regarding participation in daily activities?

- No longer needed
 - Limited by physical condition
 - Too complex
 - Uncomfortable
 - Low quality
 - Environmental / architectural constraints
 - Stigma
 - Reliance on caregiver
 - Limited accessibility (of tools/features)
 - Convenience of size / weight (for storage/transportation)
 - Poor aesthetic
 - Other _____
-

Q32 Select all that apply; I received the following types of training:

- Hands-on from healthcare professional
 - Hands-on from non-healthcare professional
 - Pamphlet/educational material(s)
 - Demonstration from caregiver (unpaid/family)
 - Demonstration from caregiver (paid)
 - Video Demonstration (or other online educational resources)
 - None
 - Other (please specify): _____
-

Q33 When I received my device, the education/training (self-education included) was effective.

- Yes
 - No
 - Somewhat
 - N/A
-

Q34 If applicable, what type of additional training would you like to receive for use of your device?
Select all that apply:

- Hands-on from healthcare professional
- Hands-on from non-healthcare professional
- Pamphlet/educational material(s)
- Demonstration from caregiver (unpaid/family)
- Demonstration from caregiver (paid)
- Video Demonstration (or other online educational resources)
- None
- Other (please specify): _____