Functional and Psychosocial Impact of Accessible Mounting Technology

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Disclosure

Lynn Gitlow and Adam Kinney do not have an affiliation with BlueSky Designs, beyond conducting this research. Dr. Gitlow and Mr. Kinney cannot identify any conflict of interest.

Dianne Goodwin and Sarah Chapman have an affiliation with BlueSky Designs, developer and manufacturer of the Mount'n Mover. Ms. Goodwin is a rehab engineer and the founder of BlueSky Designs and Ms. Chapman is an employee. BlueSky Designs supported the research in reviewing questions, sending invitations to their contact list to make them aware of the research, supplying funds to Ithaca for participant stipends, and providing a Mount'n Mover to the researchers so they would better understand the equipment they were researching.

Background/Introduction

Assistive technology is recognized as a potent intervention available to overcome the discrepancy between the functional abilities of those with disabilities and the general population (1). An assistive technology device is defined as "any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities." (1). The Mount'n Mover, a mounting system that attaches to a variety of assistive and general purpose devices that facilitate independent functioning for individuals with disabilities, fits this definition of assistive technology. This system is unique from other mounts in that it allows users to manipulate the attached device with great ease and flexibility. Users can attach the mounting system to laptops, cameras, tablets, speech devices, and other products that facilitate active participation in meaningful activities. Furthermore, the user can move these attached devices in a wide range of angles and with extreme ease. This allows a user with limited use of their upper extremities to move their device to a position that facilitates independent performance in a variety of meaningful activities (www.mountnmover.com).

Given the recognized importance of assistive technologies, such as mounting devices, in facilitating independence for people with disabilities, it is essential that professionals consider and recommend technology that furthers an individual's ability to participate in meaningful activities. To ensure resources are well-spent, there is a need to document the impact of AT devices on individuals. In particular, there is a great need for assistive technology outcome measures research that informs various stakeholders of the usability and impact of the device. While the individual user is one stakeholder outcomes research should focus on, other parties can benefit from learning the outcome of using a certain device or AT intervention. These parties are interested for multiple reasons, and include the user's social supports, manufacturers and vendors, service providers, third-party payers, rehabilitation scientists, and policy makers (2,3).

The usability of an AT device and the willingness of a person to use a given AT device are affected by multiple factors including device effectiveness, efficiency, and user satisfaction with the device in increasing one's ability to participate in activities in a variety of contexts (4). Given the importance of determining and understanding the usability outcomes of an AT device from a client's perspective, the researchers were contacted by BlueSky Designs, the developer of the Mount'n Mover, to conduct an independent investigation of consumer experience with using their mounting system. This is the first in a series of studies that will investigate users experience with the Mount'n Mover.

Methodology

Much has been written about the state of outcomes assessment in assistive technology and the challenge of choosing research design studies and assessment tools (3,5). In this study, the researchers chose a retrospective case study design using quantitative assessment to investigate the impact of using the Mount'n Mover on clients who had already purchased the device. Follow-up study will be done with new users.

More specifically, this study investigated 1) the functional and psychosocial impact of using a mounting system on those who use it. The Psychosocial Impact of Assistive Devices Scale (PIADS) was used to measure changes in functional independence and psychosocial impact of the intervention. This instrument was administered online. The PIADS is a 26-item, self-report questionnaire designed to assess the effects of an assistive device on functional independence, well-being, and quality of life. It measures factors intrinsic to the individual as well as environmental factors which impact the psychosocial functioning of the person using the device (6). The PIADS has documented reliability and validity with good clinical utility. After completing the PIADS, participants had the opportunity to be interviewed by the researchers to 2) investigate their performance and satisfaction with their performance on meaningful activities that they wanted to engage in before and after use of the mounting device. The Canadian Occupational Performance Measure (COPM) was used to structure the interview. The COPM is an individualized standardized instrument, that has been used in a number of research studies investigating outcomes of AT and is a reliable and valid measurement tool (7). The Ithaca College Human Subjects Review Committee approved the study.

A convenience sample of recipients of the Mount'n Mover device were recruited by email to take place in the study. There were 10 respondents who completed the online survey (3 females and 7 males) and four of them consented to participate in the interviews as well (1 female and 3 males).

Results (Discussion)

The mount was used for a wide variety of devices including communication devices, phones, laptops, eating trays and cameras. Eighty percent of respondents were extremely satisfied with device and felt that the device was extremely important to their lives. Eight respondents agreed or strongly agreed that they received adequate training and support in use of the device, whereas two strongly disagreed with this statement. On reviewing the results, BlueSky Designs noted that the level of direct support varies based on the vendor through which an end user receives the device. Versatility and ease of use were reported as important features of the device.

Results of the PIADS subscales are reported below. Subscale scores are calculated from responses to several individual questions and are indicated in **bold**. Results of responses regarding the users' negative emotions are also reported below (frustration, embarrassment and confusion). For each word or phrase in the subscale, the respondent chooses the response that shows how they are affected by using the Mount'n Mover.

PIADS Scores: Scale of -3 to +3, where -3 = Greatly decreases, 3 = Greatly increases			
	N	Mean	Std. Deviation
Competence*	9	2.1211	1.04858
Adaptability*	9	2.1467	1.04594
Self-Esteem*	9	2.0011	1.15948
Frustration	10	-1.40	1.350
Embarrassment*	9	-1.33	1.414
Confusion	10	-.90	2.079

*One user omitted due to missing values in items needed to calculate subscale.

The PIADS results indicate that for nine of the ten respondents, their competence, adaptability and self-esteem increased as a result of using the Mount'n Mover, whereas frustration, embarrassment and confusion were reduced.

Results of the four COPM interviews indicated that all four respondents had clinically significant improvement in their performance and satisfaction with performance of meaningful tasks that were impacted by the device. The devices that were used with the Mount'n Mover enabled users to participate in a variety of meaningful activities including toileting, eating, engaging in volunteer and work related pursuits and leisure and social pursuits.

As with any study there are limitations which must be mentioned. Respondents were recruited from a convenience sample and it may be that primarily those who were satisfied with device responded to the study. Additionally participants were asked to respond to pre-COPM questions by remembering what their feelings were before obtaining the device and these memories may be inaccurate.

Clinical Applications and Conclusion

Preliminary results indicate overall that Mount'n Mover use has positive functional and psychosocial impacts on this sampling of clients using it. Outcome measures users reported: increased effectiveness, efficiency, satisfaction and increased abilities to participate in meaningful activities when using the device. The versatility and ease of use of the device, as well as training and support, were reported by most users as being important in making devices more useable by them. Additional data is available through the researchers, and may justify recommendations for this mounting technology. Further research following users as they newly obtain the device is currently being undertaken.

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