

REQUIREMENTS OF CVA PATIENTS FOR A SOFT WEARABLE EXOSUIT

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ASSIGNMENT

The SWAG project (<https://swag-project.eu/>) funded by the European Union aims to develop a Soft Wearable Assistive Garment, which will be an exosuit for the lower limbs that supports the primary user by 'air cushions' that give them more strength. The exosuit will be designed for the following use cases: Motion assistance, occupational enhancement, wellness training and immersive haptics. Where RRD (<https://www.rrd.nl/en/>) focusses on the motion assistance case for subacute and chronic stroke patients. The development of the exosuit is based on a user-centred design. The aim of this study was to explore the requirements of the usage situations where the primary users want to facilitate the tasks or activities. And to explore the requirement of what the primary users' opinions are about the functionality on and the appearance of the exosuit.

FOCUS GROUP

A focus group was conducted with two participants who had physical impairments due to a stroke. Started with a demographical questionnaire, followed by a qualitative discussion about the usage situation, the preferences about the appearance and parts of the exosuit and lastly the design and functionality of the exosuit. A small quantitative survey was added to get practical information about the sizes, colours, and limits of the primary user. Creative means and inquiries were used to carry out the discussion. Thematic analysis was used to analyse the focus group data using the program Atlas.ti. Validity & reliability were used to have a critical eye on the research process and the results.

RESULTS

It was found that participants wanted to use an exosuit for situations, tasks, or activities that were challenging or impossible to do after they were fully revalidated. The addition of an exosuit would approximate the participant's normal functioning of an average person's mobility. As the objective of this exosuit is not for revalidation but for daily use, the participants would greatly appreciate it if the components of the suit were modular, flexible, invisible, easy to donning and doffing. And still wear the exosuit without the electronical and mechanical support. The results will provide the technical teams more insights into the wishes of the end-users.

CONCLUSION

This study emphasizes the importance of making future soft wearable exosuits for own use comfortable, modular, accessible only by one hand, independently to use, easily to donning and doffing and not noticeable for the bystanders of the user. Those findings can be used for further developments of lower limb supports of stroke patients.

RESULTS - REQUIREMENTS

In the visuals on this page, all the requirements that were based on the results of the study can be seen. For example, requirement 4 means that the closures on the exosuit should be accessible with the use of only one hand.

