Motivation and Objective

Patients are more engaged in rehabilitation exercises when games are added to rehabilitation robots [1, 2]

The design and development of rehabilitation games often have a minimum or no involvement of exercise therapists and patients [2].

The objective of this research is to identify game design elements for virtual reality (VR) that support therapeutic goals while motivating patients.

Methodology and Procedure

14 participants with backgrounds in physiotherapy, occupational therapy, physician, nursing, therapy assistants, engineering and game designing.

A participatory co-design process that included a brainstorming session was used:

1) Introductory presentation
2) Interacting with the VR systems and games (Fig 1)
3) Brainstorming session using the crazy 8’s method
4) Sharing ideas
5) Grouping ideas into similar categories (Fig 2)
6) Summarizing ideas
7) Affinity diagram (Fig 3)

Fig. 1. The rehab robot with head-mounted VR headset
Fig. 2. Participatory co-design session with physical therapists

The proposed games are categorized into 3 main groups: 1) Activities of Daily Living (ADL), 2) Fun and Fictional Games, and 3) Music and Art. Key ideas from therapists that emerged were:

- While fictional games can be more appealing compared to ADL games, therapists did not think they are more effective; they did not think patients would see a clear benefit of playing them compared to real-world emulations.
- Games should be functional and represent ADL. Therefore, fun and fictional games were less popular with the therapists in this study.
- Games should represent movements such as grasping, catching objects, reaching to a predefined point or region, and staying at that point or region for an allocated time.
- Patients enjoy exploring their creative side as well as having background music during the rehabilitation sessions.

Results

The number of ideas identified per each game/category are indicated in brackets.

The bolded fonts are for the ideas that have the most popularity in each subcategory among therapists.

Conclusion

The results of the brainstorming session indicate that, while fictional games may be more entertaining and appealing than other game categories, rehabilitation games that simulate real-life events or environments were more attractive for rehabilitation therapists.

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References