Feasibility of Mobile Health for Rehabilitation – Pilot Study in Finland
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Background

- Osteoarthritis (OA)
  - The most common joint disease in the world [1].
  - A risk of OA increases with age; almost 90% of people over age 65 years have radiological OA related changes in one's joints [1].
  - A knee and hip OA causes long-lasting physical activity limitations more than any other disease [1].
  - The symptoms of OA lead often to avoidance of physical activity and this can cause disability, diseases and decreased quality of life [1].
Treatment of OA

- The main goal of the treatment of OA is to maintain and improve the pain management and functional capacity [2].
- An aerobic exercise, muscle strengthening, and mobility exercises aim to promote quality of life [3, 4].
Technology in Health Promotion

- In the field of physiotherapy, a video guidance with help of computer or television is a typical eHealth method.
- A video based exercise guidance increases adherence to intervention [3, 4], and is related better result of the treatment [5, 6].
- Mobile technology has been used e.g. to track physical activity, to provide healthy diet counseling, and to support patients also in other health problems [7].
Methods

- Designing based on human-centered design cycle (ISO 13407, 1999)
- Workshops with experts of various fields
  - Knowledge about physiotherapy, rehabilitation and physical activity
  - A definition of needs (e.g. improving physical activity, home based rehabilitation, motivating)
- The aim of the study was to develop user-friendly prototype of mobile application and to examine the feasibility of the mobile application
The Prototype of Mobile Application

- Programmed for Nokia 5800 XpressMusic smartphone with Symbian S60 operating system
- Touch screen interface, media-rich outfit with Adobe Flash Lite 3.1
- Videos (Physiotools Ltd) were converted to mobile format and spoken instructions were stored in mp3-format
- The progress in graphical form, an individual goal for physical activity
- Inquiries were included: the amount of performed exercise, the strain, the psychological vitality, the pain
The Field Trial

- An eight-week field trial, (n=23, post menopausal women, mean age 60 (SD 4.5) years)
  - 1) a mobile group instructed by mobile device (n=13) and
  - 2) a control group (n=10)
  - The exercise program was recommended to be done three times in a week

- Feasibility (5 graded Likert scale and qualitative data), usability (System Usability Scale SUS [8])

- Physical measurements: leg extensor power (Nottingham Power rig –dynamometer [9]) and dynamic balance (timed figure of 8 running test)
Results

- At the baseline
  - The mobile application: easy to use
  - Main experiences about usability: interesting and motivating
  - Some difficulties in using a touch screen interface
Results

- After intervention, functionality, usability and innovativeness were the main categories describing the application (e.g. functionality, easiness to use, and enhanced motivating features).
- Usability of the mobile application was ranked 87.3 (sd 7.9) out of 100 SUS-points.
- Adherence to intervention was 91 % in the mobile group and 98 % in the control group.
- The mobile group ranked the feasibility of intervention higher in 5 graded Likert-scale (mean 4.46; 95% CI 4.20 to 4.72) compared with the control group (4.14; 3.67 to 4.61) (p<.001).
- There was no significant improvement or difference between the groups in leg extensor power or dynamic balance.
Conclusion

- The intervention was relatively short-term; it was not expected to find any significant differences within or between the groups in the results of the physical performance.
- The adherence in both groups was high; when developing mHealth, the application should be encouraging and motivating.
- The requirements of the end-users should be taken into account.
- The usability of the application is important.
- The results of this study are promising and the mobile application turned out to be feasible in the home-based rehabilitation.
- To explore the effectiveness of mHealth, more RCT-studies are needed.
References

Thank you!