TRACK: WORK – LEISURE – VOLUNTEERING Presentation: Physical activity motivation

S.N.W. VORRINK. Development of a mobile phone application for daily physical activity motivation in COPD (Chronic Obstructive Pulmonary Disease). Gerontechnology 2012;11(2):423; doi:10.4017/gt.2012.11.02.114.00 Purpose Chronic obstructive pulmonary disease (COPD) is a disabling airway disease with variable extra-pulmonary effects that may contribute to disease severity in individual patients¹. Patients with COPD demonstrate reduced levels of spontaneous daily physical activity (DPA) compared with healthy controls². This results in a higher risk of hospital admission and shorter survival³. Pulmonary rehabilitation can help to improve the DPA level, however, these benefits decline after 1-2 years⁴. In order to maintain DPA in COPDpatients after rehabilitation; we developed a mobile phone application. This application measures DPA and shows the information to the patient via the display of the mobile phone. A physiotherapist can monitor the patient via a secure website where DPA measurements are visible for all patients. Here, DPA goals can be adjusted and text messages sent. Method For the development of the application, three pilot studies were performed using questionnaires to test the mobile phone application for usability, user friendliness, and reliability. The application was tested with students and COPD patients. Pilot study 1, 2, and 3 lasted for a week (n=10 students), 3 days (n=3), and 3 weeks respectively (n=7). At the end of each study, subjects gave their feedback on the application via a focus group. Subjects also wore an accelerometer (Sensewear) during the period of the study in order to compare these data with the DPA measurements of the mobile phone application. Results & Discussion The application was found to be useful and easy to use. Subjects mentioned that it was easy to learn how it worked. They were unconcerned by the fact that health care professionals could see information on their physical activity performance. They thought it important to be able to determine who can or cannot access this information. These results hold true for both the students and the COPD-patients. The subjects were provided with an improved version of the application for every next pilot study. Feedback from the focus groups, questionnaires, and accelerometer were used to improve the application. Correlations between the accelerometer and the measurements of DPA by phone for steps per hour were 0.69 and 0.70 for pilot studies 1 and 2 respectively. The version of the application in pilot study 3 contained an error, which made correlations with the accelerometer unusable. The usability of the website for the physiotherapist was not tested in the pilot studies since the first step was to develop the application on the mobile phone. The next step will be to improve the website with feedback from physiotherapists. After that, the method of using the application and website will be tested in a controlled study with COPD-patients.

References

- 1. Rabe KF, Hurd S, Anzueto A, Barnes PJ, Buist SA, Calverley P, Fukuchi Y, Jenkins C, Rodriguez-Roisin R, Weel C van, Zielinski J. Global Initiative for Chronic Obstructive Lung Disease. American Journal of Respiratory and Critical Care Medicine 2007;176(6):532-555; doi:10.1513/pats.200807-075TH
- Pitta F, Troosters T, Spruit MA, Probst VS, Decramer M, Gosselink R. Characteristics of Physical Activities in Daily Life in Chronic Obstructive Pulmonary Disease. American Journal of Respiratory and Critical Care Medicine 2005;171(9):972-977; doi:10.1164/rccm.200407-855OC
- 3. Pitta F, Troosters T, Probst VS, Spruit MA, Decramer M, Gosselink R. Quantifying physical activity in daily life with questionnaires and motion sensors in COPD. European Respiratory Journal 2006;27(5):1040-1055; doi:10.1183/09031936.06.00064105
- Foglio K, Bianchi L, Bruletti G, Porta R, Vitacca M, Balbi B, Ambrosino N. Seven-year time course of lung function, symptoms, health-related quality of life, and exercise tolerance in COPD patients undergoing pulmonary rehabilitation programs. Respiratory Medicine 2007;101(9):1961-1970; doi:10.1016/j.rmed.2007.04.007

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