

Promoting Patients' Adherence to Home-Based Rehabilitation: A Randomised Controlled Trial of a Theory-Driven Mobile Application

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Abstract : The integrated model of self-determination theory and the theory of planned behaviour has been successfully applied to explain individuals' adherence to health behaviours, including behavioural adherence toward rehabilitation. This study was a randomised controlled trial that examined the effectiveness of an mHealth intervention (i.e., mobile application) developed based on this integrated model in promoting treatment adherence of patients of anterior cruciate ligament rupture during their post-surgery home-based rehabilitation period. Subjects were 67 outpatients (aged between 18 and 60) who undertook anterior cruciate ligament (ACL) reconstruction surgery for less than 2 months for this study. Participants were randomly assigned either into the treatment group (who received the smartphone application; N = 32) and control group (who receive standard treatment only; N = 35), and completed psychological measures relating to the theories (e.g., motivations, social cognitive factors, and behavioural adherence) and clinical outcome measures (e.g., subjective knee function (IKDC), laxity (KT-1000), muscle strength (Biodex)) relating to ACL recovery at baseline, 2-month, and 4-month. Generalised estimating equation showed the interaction between group and time was significant on intention was only significant for intention (Wald $\chi^2 = 5.23$, $p = .02$), that of perceived behavioural control (Wald $\chi^2 = 3.19$, $p = .07$), behavioural adherence (Wald $\chi^2 = 3.08$, $p = .08$, and subjective knee evaluation (Wald $\chi^2 = 2.97$, $p = .09$) were marginally significant. Post-hoc between-subject analysis showed that control group had significant drop of perceived behavioural control ($p < .01$), subjective norm ($p < .01$) and intention ($p < .01$), behavioural adherence ($p < .01$) from baseline to 4-month, but such pattern was not observed in the treatment group. The treatment group had a significant decrease of behavioural adherence ($p < .05$) in the 2-month, but such a decrease was not observed in 4-month ($p > .05$). Although the subjective knee evaluation in both group significantly improved at 2-month and 4-month from the baseline ($p < .05$), and the improvements in the control group (mean improvement at 4-month = 40.18) were slightly stronger than the treatment group (mean improvement at 4-month = 34.52). In conclusion, the findings showed that the theory driven mobile application ameliorated the decline of treatment intention of home-based rehabilitation. Patients in the treatment group also reported better muscle strength than control group at 4-month follow-up. Overall, the mobile application has shown promises on tackling the problem of orthopaedics outpatients' non-adherence to medical treatment.

Keywords : self-determination theory, theory of planned behaviour, mobile health, orthopaedic patients

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