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THE DEVELOPMENT OF A SMARTPHONE APP FOR TREATMENT OF URGENCY AND MIXED URINARY INCONTINENCE IN WOMEN

Hypothesis / aims of study

There is an increasing demand for easily accessible, effective health care solutions. In Sweden, more than 80% of the adult population owns a smartphone, and the number is still increasing. The efficacy and cost-effectiveness of treatment via smartphone app has previously been demonstrated in a study on women with stress urinary incontinence (SUI) [1,2]. As is the case with SUI, many women with urgency (UUI) or mixed (MUI) urinary incontinence are reluctant to seek treatment. Potential reasons may be embarrassment, insufficiently accessible health care, or fear of not being taken seriously. The first-line treatments for these types of urinary incontinence (UI) are pelvic floor muscle training, lifestyle changes, and bladder training [3]. A smartphone app could be one way of increasing access to these treatments. Therefore, our aim was to develop a new complex treatment programme, based on evidence and long-standing clinical experience, in the form of an interactive smartphone app intended for treatment of UUI and MUI in women.

Study design, materials and methods

After two years of preparation, a smartphone app was developed in the autumn of 2016 by researchers in collaboration with the technical development division at the local university. It was developed using Xamarin software for iOS and Android smartphones, and required iOS 8.0 or Android 4.0.3 or later versions. During its test phase (between November 2016 and March 2017), the app was released via the HockeyApp distribution platform and tested twice in larger groups of 9 and 7 persons respectively. On both occasions the group consisted of researchers and clinicians (in the fields of general practice, urotherapy and urogynaecology) as well as laymen. Feedback from the test group was collected in a predefined form and used to further refine the design of the treatment app in terms of functionality as well as information content and exercises. Additionally, the app was tested in a total of 25 different versions in a smaller group that was more directly involved in the development. The final version of the app was released on AppStore and Google Play in March 2017.

Based on user opinions and researchers' experiences from development of a previous app in a similar context, desirable features in the app were usability, an appealing design, educational text content based on research and experience, easily accessible exercises, and a feedback function. A professional illustrator was hired to design illustrations and animations for the app. Another desired feature of the app was individual advice on factors related to incontinence. For this, a multi-professional team of researchers and clinicians consisting of experienced general practitioners, urotherapists, a urogynaecologist, and psychologists together defined the criteria for providing advice. The final items of advice were based on team consensus, findings from studies, and clinical experience.

A limited version of the smartphone app intended for a control group was also constructed, containing brief education about lifestyle factors and basic information on the treatment programmes available in the full version of the app.

Results

For the smartphone treatment app, a structure with four different modules was developed (image 1). One of the modules contained a treatment programme with pelvic floor muscle training (PFMT), which has previously been demonstrated to be effective [1]. Other modules included a bladder training programme and information on lifestyle factors related to incontinence (i.e. physical activity, weight, local oestrogen treatment, fluid intake, sexuality, food, and incontinence aids). Psychological education and assignments focusing on thoughts and behaviour relating to excessive security measures and avoidance constituted a separate module. A feedback function was integrated into the app that regularly generated questions on degree of inconvenience. Automatic feedback was provided depending on whether the answer indicated improvement, no change or change for the worse. In addition, the app contained a function with individual advice, based on self-reported information from the user, regarding what to focus on in the treatment programme. The advice covered the following topics: type of incontinence, volume of micturition (total volume and portion volume), "preventive" micturition (i.e. the tendency to urinate "just-in-case"), local oestrogen treatment, coffee and tea intake, obesity, smoking habits, anxiety, and constipation. A logarithm was formed to extract and analyse data from questionnaires; the output from the logarithm, combined with information from a bladder diary, was used to generate suitable advice for each individual user of the treatment app. Following the advice was voluntary, as usage of the app was to be based entirely on patient preference. Finally, an individual statistical overview of performed exercises was included, as well as the ability to set reminders for when to perform the exercises. The app was CE-marked in accordance with applicable standards.

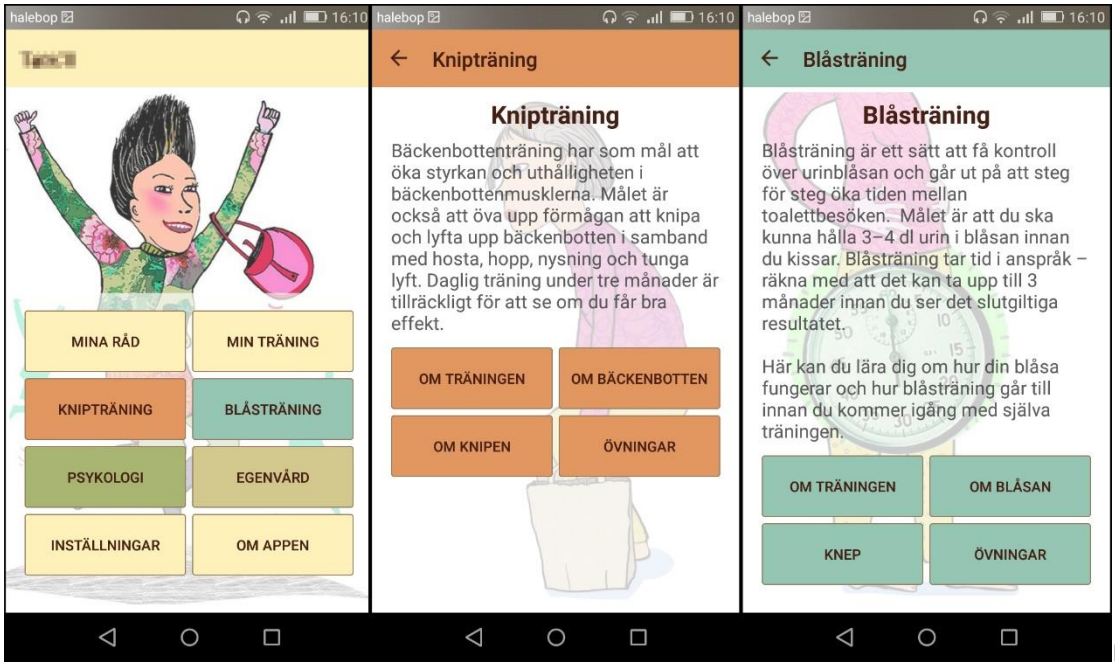

Image 1.

The effect of using this app for treatment of MUI and UUI in women will be evaluated in a randomized controlled trial registered at Clinical Trials and ethically approved. The intervention group will receive the full (“treatment”) app and the control group will receive the limited (“information”) app.

Interpretation of results

We have developed a new smartphone app aimed at women with UUI and MUI, that contains complex treatment programmes and lifestyle information based on research and multi-professional clinical experience.

Concluding message

A smartphone app can provide a complex treatment programme with individual advice and feedback for women with mixed and urgency urinary incontinence. If the app is demonstrated to be effective, it might facilitate access to first-line treatment for women interested in self-management, and serve as support for care-as-usual.

References

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