

Usage Results of a Mobile App for Managing Urinary Incontinence

Jeff Pepper,* Amy Zhang, Rui Li and Xiao Hui Wang

From Touchtown Inc, Oakmont (JP), and Department of Psychiatry, University of Pittsburgh, Pittsburgh (XHW), Pennsylvania, and Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio (AZ, RL)

Abbreviations and Acronyms

BMI = body mass index

iOS = Internetwork Operating System

QUID = Questionnaire for Urinary Incontinence Diagnosis

UI = urinary incontinence

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Purpose: Slight changes in urinary incontinence severity may be difficult to notice, so that even high functioning patients are unable to detect if urinary incontinence is improving or worsening. We describe a recently released free software app, iDry®, that enables individuals with urinary incontinence to document incontinence symptoms, view progress, evaluate effectiveness of interventions and report status to their health care provider.

Materials and Methods: After 2 field trials, iDry was published as a free download from the Apple® App Store and was downloaded 1,231 times in the first 19 months. iDry also collects large quantities of anonymized usage data for research purposes.

Results: Data analysis shows that long-term users had significantly more severe urinary incontinence symptoms ($p \leq 0.01$) than short-term users. Short-term users reduced pad use by 20% but long-term users' pad use remaining unchanged. Average leakage was reduced 14.6 mg per day for short-term vs 4.5 mg per day for long-term users, but this difference was not statistically significant ($p=0.93$) due to high data variability (SD 611). There was no significant difference between long-term and short-term users in severity of self-reported stress and urge incontinence. Bladder training positively correlated with a reduction in pad use ($p=0.03$) and leakage amount ($p=0.02$).

Conclusions: Overall our findings suggest that iDry is a useful, accessible and convenient tool to document urinary incontinence symptoms and improvement, but controlled studies are needed to assess its effectiveness.

Key Words: urinary incontinence, software

URINARY incontinence is a serious problem affecting more than 13 million Americans, with annual direct health care costs of more than \$30 billion.¹ While UI is often associated with the elderly, a recent study showed that 15% of young women age 18 to 30 also reported urinary incontinence.²

Slight changes in UI severity, such as a 10% change in total leakage over a month, may be difficult to notice, leading even high functioning patients to be unable to tell physicians

whether their UI is getting better or worse, and physicians being unable to determine the effectiveness of prescribed interventions. To our knowledge there are no other available tools that document incremental changes in UI symptoms while also assisting patients and physicians in evaluating the efficacy of interventions.

We describe a free software app, iDry, developed by Touchtown Inc., that addresses this problem in 2 ways. 1) iDry enables individuals with UI to

conveniently and accurately document their incontinence symptoms, view progress in managing UI, evaluate effectiveness of interventions and report status to health care providers. Improved self-monitoring enhances the self-management of symptoms.³ 2) iDry collects large quantities of anonymized usage data, assisting researchers in studying health behaviors and incontinence outcomes. iDry has several built-in features to help achieve these goals.

Incident Logging

A patient can record urine loss by selecting the time of a pad change (defaulting to “now”), selecting a pad from a database of 210 popular products and using a slider to indicate the degree of pad saturation (fig. 1). Data entry is quick, encouraging consistent data input and accuracy. The user selects the method, which can be as formal as weighing the wet pad or as simple as estimating the degree of pad saturation. A progress summary section shows



Figure 1. Main iDry log screen, used to record pad changes and display summary of user changes in UI with time.

overall progress by awarding 1 to 6 stars and showing an estimated date when, if trends continue, the user might be completely dry.

Charting

Based on automated analysis of logged data, iDry shows the number of pad changes and the self-reported urine loss by day, week, month, quarter and year (fig. 2). Other charts show number of pads used, volume of urine loss and rate of urine retention over time. All charts show percentage change over time (for example, “15% improved vs previous month”).

Evaluating Interventions

iDry’s database contains 48 interventions for managing UI, including lifestyle management (alcohol control, managing fluid intake etc), physical therapy (biofeedback, bladder training etc), medications (imipramine etc), holistic and alternative therapies (yoga and herbs), physical devices, and surgical and medical procedures. Users can select an intervention, read a brief summary and research further by clicking a hyperlink. They can also activate an intervention, causing iDry to track the user’s progress since the start of that intervention, for example, “Alcohol control: 32% improvement since Jan 14, 2014.” iDry separately tracks progress for each intervention, allowing users to evaluate the effectiveness of each.

Reminders

Users can use this feature to set reminders for activities such as pelvic floor muscle exercises and scheduled voiding. They can specify the days when reminders are sent, start and end times, frequency of reminders and reminder texts.

Settings

Various settings allow users to report demographic information such as birth year, gender, height, weight, race, UI cause, UI start date, severity of symptoms and interventions used (fig. 3). User privacy is maintained as none of the entered information in iDry can be used to identify individual users.

Data Sharing

There are 2 data sharing features. Users can email a chart or raw data for any period. The Share Data feature automatically downloads anonymized data to a HIPAA compliant database for research use. Users can easily disable automated data sharing if desired.

Feedback

Users can send feedback to the app’s development team and can submit reviews to the Apple App Store. Overall iDry presents a novel tool to benefit

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