

MyMediHealth: A Paradigm for Children-Centered Medication Management

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Summary: Medication management of children with chronic conditions is complex because of the need to tailor dosages based on a child's age, weight, and development, and because of the likelihood that such children have multiple caregivers. A team at Vanderbilt University Medical Center in Tennessee is addressing medication management in the pediatric population through further development of MyMediHealth, a mobile personal health application for medication management that is built to interface and share information with a personal health record (PHR). The overarching goal of this project is to investigate ways that PHRs and supported applications might improve the safety and quality of medication delivery.

The study is evaluating the impact of the MyMediHealth application on medication adherence in children ages 12-to-18 who have asthma and are patients at the Vanderbilt Primary Care Clinic. The control group received education on asthma management, while the intervention group received education and training about asthma management and the use of MyMediHealth. The application provides medication information and reminders to children by cell phone. Patients are able to create medication schedules, schedule alerts to mobile devices, and examine medication administration information.

The project team developed a knowledge base of common pediatric asthma medications that have been incorporated into MyMediHealth and are part of the evaluation of the application on medication adherence. The study measures also include effect on family dynamics, disease control, and impact on caregivers outside the home, such as school caregivers and health care providers.

Specific Aims:

- Develop an information and scheduling knowledge base for common pediatric asthma medications (including allergy medications). **(Achieved)**
- Adapt MyMediHealth in its current prototype form to patients diagnosed with asthma. **(Achieved)**
- Evaluate the impact of MyMediHealth on medication adherence. **(Achieved)**

2012 Activities: The evaluation of MyMediHealth was completed in 2012. This included evaluation of medication adherence using ecological momentary assessment, which uses cell phones and other electronic devices to capture dosing at the time of the event. The research team recruited 50 children for the intervention and 50 children for the control. Both groups received information on asthma management

and the intervention group also received information on MyMediHealth so that the group could receive reminder messages via cell phone for asthma medication dosing. The MyMediHealth Web site allows families to enter information on a child's asthma dosing regimen and includes a place to input the child's asthma action plan. The families can also use the Web site for data tracking after they have begun using the application.

The team completed home visits with 20 percent of the users to further understand their daily environment. This provided more in-depth understanding of barriers to medication adherence and barriers to the intended use of the MyMediHealth tool. In terms of tool use, the team looked at both user testing of the site to identify any problems from the user perspective, and assessed how the home environment might have supported or created barriers to using the tool. Both parent and child were included in the assessment as the tool was used by the family initially, and then by the child independently.

The research team is using a 1-year no-cost extension to complete data analysis from the qualitative interviews done during the home visits and to complete three planned publications. As last self-reported in the AHRQ Research Reporting System, project progress and activities are mostly on track and project spending is roughly on target.

Preliminary Impact and Findings: An important finding of the project is how people use reminders. The project team initially planned to pilot the medication reminders for 9 months, but after only 2 weeks had a good understanding of usage of the reminder system.

A second finding is that there is quite a bit of cost associated with bi-directional texting to confirm compliance with medications. This is especially true if a patient is taking four-to-five medications. Some of the study participants have unlimited texting plans and others do not. Despite the potential cost, the project team decided not to make unlimited texting a requirement for inclusion in the evaluation.

The team also learned about some cell phone carrier-dependent technical challenges to transmitting messages. For example, the research team found that depending on the mobile carrier, reminder messages sent out through the mobile device might be delayed as many as 24 hours. The team also found that the "unsubscribe" function on cell phone lists might inadvertently cancel medication reminders, when the intent was to unsubscribe from a different non-health related list, such as updates from a musical artist.

Target Population: Asthma, Chronic Care*, Medicaid, Pediatric*, Teenagers

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve the quality and safety of medication management via the integration and utilization of medication management systems and technologies.

Business Goal: Knowledge Creation

** This target population is one of AHRQ's priority populations.*