Personal Health Record Design: Qualitative Exploration of Issues Inhibiting Optimal Use

Diabetes Care 2014;37:e13–e14 | DOI: 10.2337/dc13-1630

Kevin T. Fuji,[1] Amy A. Abbott,[1,2] and Kimberly A. Galt[1,3]

Personal health records (PHRs) have been purported to enhance patients' self-management of diabetes (1). However, few studies have examined the barriers to PHR use resulting from design issues identified by actual users (2). To address this gap, interviews were conducted with 59 patients 3 to 6 months after receiving hands-on training in the use of the Microsoft Health Vault for PHRs to manage their diabetes-related health information. Health Vault was selected because of its universal accessibility and functionalities meeting the greatest number of patient desires (3). The central question guiding the interviews was "How have you used the PHR to manage your diabetes-related health information?" Data were analyzed through a process of coding, category development of similar codes, and overarching theme development.

Twenty-three of the 59 participants (39%) sustained PHR use. Table 1 displays the demographic, clinical, and thematic comparisons between PHR users and nonusers. Three themes describing barriers to use from patients' perspectives could be traced back to PHR design considerations.

Theme 1: Difficult to Use

The PHR was difficult to navigate (e.g., moving from the homepage to the log-in page) and demanding as an application as a result of its data entry requirement. As a participant shared, "I think it requires a lot of clicking to put in your history," commenting on the need to assign unit labels for laboratory test results in order for the PHR to accept the information. Prepopulated unit labels for laboratory results and indications of the normal limits for each laboratory test will address health literacy issues and enhance PHR use (4).

Theme 2: Lack of Added Value

Participants did not perceive the PHR as having added value for managing their existing self-care behaviors. The PHR is a "one-size-fits-all" technology that has been proposed to help patients regardless of their health status. Adding functionalities would bring greater value to patients with varying levels of desired engagement and need. For example, identification of potential drug-drug interactions at the point the user enters data could stimulate adoption of PHR use because of the ability to gain personalized knowledge about patients' own care management (3).

Theme 3: Life Got in the Way

For many people, long work hours, transporting children to school and other activities, personal illness, and other family-related issues made it difficult to find time to physically sit at a computer and use the PHR. Mobile platforms for PHRs would create a flexible mode of interacting with the PHR for individuals who are busy, traveling, or on the go (5).

No differences were observed in the demographic, clinical, and thematic comparisons between PHR users and nonusers with the exception of blood glucose levels at follow-up ($P = 0.027$). Those with better blood glucose control continued to use the PHR by working through these difficulties. However, during the interviews users centered their attention on PHR difficulties, all of which can be addressed.

Better PHR design can improve the PHR use experience by moving beyond a data repository and creating functionality that enables patients to receive feedback about entered data, enhances their knowledge about their current health status, and stimulates self-care change.

Acknowledgments. The authors thank Dr. Carolyn Manhart and Dr. Anna Maio of the Creighton University School of Medicine for their support of the project and for serving as gatekeepers for clinic access; Dr. Andjela Drincic of the University of Nebraska Medical Center for her mentorship and expertise in the area of endocrinology, which was crucial to the early conception and development of

---

[1] *Creighton University Center for Health Services Research and Patient Safety, Omaha, NE*
[2] *Creighton University College of Nursing, Omaha, NE*
[3] *Creighton University School of Dentistry, College of Nursing, and School of Pharmacy and Health Professions, Omaha, NE*

Corresponding author: Kevin T. Fuji, kfuji@creighton.edu.

Table 1—Demographic characteristics of study participants comparing PHR users and nonusers

Demographic characteristics	Overall ($N = 59$)	PHR users ($N = 23$)	PHR nonusers ($N = 36$)	P value
Age (years)	58.7	60.9	57.4	0.211
Female sex, *n* (%)	36 (61.0)	16 (69.6)	20 (55.6)	0.282
Race, *n* (%)				
White	42 (71.2)	17 (73.9)	25 (69.4)	0.712
Black or Hispanic	17 (28.8)	6 (26.1)	11 (30.6)	
Time since diagnosis (years)	13.2	16.0	11.3	0.081
Marital status, *n* (%)				
Married	33 (55.9)	15 (65.2)	18 (50)	0.251
Single	26 (44.1)	8 (34.8)	18 (50)	
Education, *n* (%)				
Less than college graduate	37 (62.7)	14 (60.9)	23 (63.9)	0.815
College graduate	22 (37.3)	9 (39.1)	13 (36.1)	
Income, *n* (%)*				
<\$70,000	39 (66.1)	16 (69.6)	23 (63.9)	0.992
≤\$70,000	17 (28.8)	7 (30.4)	10 (27.8)	
Depression diagnosis, *n* (%)	17 (28.8)	4 (17.4)	13 (35.1)	0.122
HbA$_{1c}$, % (mmol/mol)				
Baseline	7.81 (62)	7.46 (58)	8.05 (64)	0.267
Follow-up	7.94 (63)	7.78 (62)	8.05 (64)	0.630
Blood glucose (baseline)	173.2	151.1	187.0	0.121
Blood glucose (follow-up)	185.9	156.5	205.9	0.027
Theme 1: difficult to use, *n* (%)	23 (38.9)	12 (52.2)	11 (30.6)	
Theme 2: lack of added value, *n* (%)	25 (42.4)	10 (43.5)	15 (41.7)	
Theme 3: life got in the way, *n* (%)	12 (20.3)	5 (21.7)	7 (19.4)	

*Missing information for three subjects.

this study; Heather Jensen of the Creighton University Center for Health Services Research and Patient Safety for conducting interviews and coordinating follow-up of study participants; and Ted Kasha of the Creighton University Center for Health Services Research and Patient Safety for managing study data.

Funding. This project was supported by grant R24HS018625 from the Agency for Healthcare Research and Quality. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Agency for Healthcare Research and Quality.

Duality of Interest. No potential conflicts of interest relevant to this article were reported.

Author Contributions. K.T.F. contributed to the study design, conducted data collection, analyzed and interpreted data, and wrote the manuscript. A.A.A. conducted data collection, analyzed and interpreted data, and reviewed/edited the manuscript. K.A.G. contributed to study design, interpreted data, and reviewed/edited the manuscript. K.T.F. is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Prior Presentation. Portions of this study were presented in poster form at the 37th Annual Research Conference of the Midwest Nursing Research Society, Chicago, Illinois, 7 –10 March 2013, and at the 2012 AcademyHealth Annual Research Meeting, Orlando, Florida, 24–26 June 2012.

References

1. Hess R, Bryce CL, Paone S, et al. Exploring challenges and potentials of personal health records in diabetes self-management: implementation and initial assessment. Telemed J E Health 2007;13:509–517
2. Archer N, Fevrier-Thomas U, Lokker C, McKibbon KA, Straus SE. Personal health records: a scoping review. J Am Med Inform Assoc 2011;18:515–522
3. Fuji KT, Abbott AA, Galt KA, Drincic A, Kraft M, Kasha T. Standalone personal health records in the United States: meeting patient desires. Health Technol 2012;2:197–205
4. Detmer D, Bloomrosen M, Raymond B, Tang P. Integrated personal health records: transformative tools for consumer-centric care. BMC Med Inform Decis Mak 2008;8:45
5. Tom JO, Mangione-Smith R, Solomon C, Grossman DC. Integrated personal health record use: association with parent-reported care experiences. Pediatrics 2012;130:e183–e190