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Utilization of E-Health Services Among U.S. Adults With Diabetes

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Electronic health (e-health) services have become increasingly important as a method to improve access to health care, including online renewal of prescription medications and making appointments. Healthy People 2020 includes objectives related to e-health to improve population health outcomes and to reduce health disparities, particularly to improve shared decision-making processes between patients and health care professionals (1). E-health services have been encouraged as part of the strategy to improve diabetes care and prevention (2,3). The adoption of these services among health care professionals has improved the quality and efficiency of care (4). However, e-health services may be underutilized among patients with diabetes. While research related to e-health services has been conducted in clinical and managed care settings (5), there are no national population estimates or trends for the utilization of e-health services among U.S. adults with diabetes.

We analyzed the 2009–2013 National Health Interview Survey (NHIS) (12,689 respondents aged 18 years with diabetes) self-reported data. NHIS is a cross-sectional household survey, using a multistage area probability design of the U.S. noninstitutionalized civilian population. NHIS is the first nationally representative household survey to include questions on the use of health information technology. Utilization of e-health services was defined as scheduling appointments, communicating with health care providers, and refilling prescription medications online. We calculated the predictive margins for the estimates of e-health utilization from multivariate logistic regression, controlling for age, sex, race/ethnicity, educational attainment, poverty-to-income ratio, health insurance coverage, having

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Duality of Interest.

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

Author Contributions.

C.-F.C. contributed to the study concept and design, analyzed the data, and wrote the manuscript. K.M.B., J.B.S., H.M.D., J.C., G.I., J.M., and A.A. contributed to the interpretation of the data and the drafting of the manuscript. C.-F.C. 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.

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at least one visit to a doctor or health care professional in the past year, self-rated health status, history of other chronic diseases, diabetes duration, and diabetes medication. We used SAS-Callable SUDAAN 10.0.1 software to account for the complex sampling design of the NHIS. Differences were considered statistically significant at P values < 0.05 .

Overall, for adults with diabetes, the multivariate-adjusted prevalence of scheduling appointments, communicating with health care providers, refilling prescriptions online, and any e-health service use were 3.9%, 5.8%, 9.0%, and 13.8%, respectively. Between 2009 and 2013, the proportion of adults with diabetes reporting any e-health service significantly increased from 11.7% (95% CI 10.2–13.5) to 15.0% (13.6–16.6). Individual e-health utilization also generally increased over time, although the increase for refilling prescriptions online did not reach statistical significance. Using the Internet to make appointments increased twofold from 2009 to 2013; using e-mail to communicate with health providers increased from 4.4% in 2009 to 7.3% in 2013 (Fig. 1).

This study provides national benchmark estimates and trends for the utilization of e-health services and can serve as a basis for focused efforts to monitor the use of e-health services and health outcomes among people with diabetes. Our data indicate that levels of e-health service use are low among people with diabetes. While three indicators show improvement, refilling prescriptions online decreased from 2011 to 2013. Future studies may identify barriers and enablers to e-health service utilization and assess its relevance to better health outcomes. Interventions might then be targeted to improve the use of the Internet to address medical care needs among people with diabetes.

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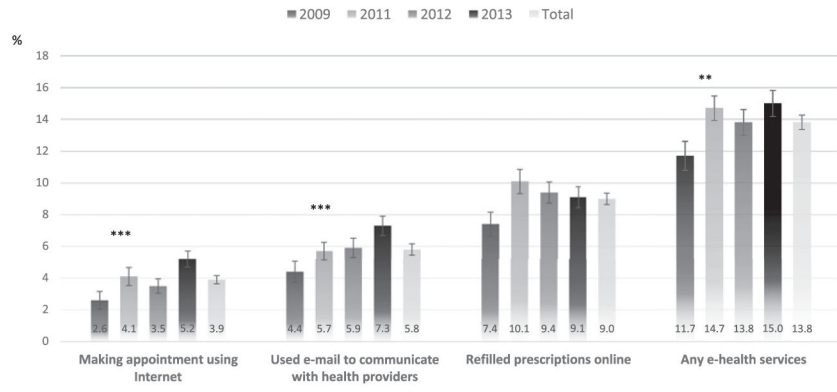


Figure 1. Adjusted prevalence of e-health services use by year. Hash bars mean 95% CI. ** $P < 0.01$; *** $P < 0.001$.