Examining Healthcare Providers' Acceptance of Data From Patient Self-Monitoring Devices Using Structural Equation Modeling With the UTAUT2 Model

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ABSTRACT

As wide-scale adoption by the market and consumers of ubiquitous devices or mobile apps that track fitness, sleep, nutrition, and basic metabolic parameters increases, it is vital to understand the attitudes of healthcare providers toward these devices. No researcher has previously examined how constructs related to technology acceptance have impacted healthcare providers' behavioral intention for self-monitoring devices (SMD). This was a quantitative, non-experimental study to examine SMD acceptance, intent to use, and other factors important to physicians regarding SMD. Statistical analysis of the data gathered showed that the second version of the Unified Theory of Acceptance and Usage of Technology (UTAUT2) constructs of performance expectancy, hedonic motivation, and price value were positively associated with the behavioral intention of SMD by physicians while effort expectancy and social influence were not. Furthermore, social influence was associated with use, while performance expectancy, effort expectancy, and hedonistic motivation were not. Major positive implications of these findings include: contribution to the body of literature in the health information technology (HIT) arena regarding factors that influence technology acceptance and potential increase in the adoption of SMD among healthcare providers.

KEYWORDS

Self-Monitoring Device, Technology Acceptance, Ubiquitous Device, UTAUT, UTAUT2

INTRODUCTION

Innovation refers to the "tendency of an individual consumer to adopt new products before large numbers of others do" (Lynn & Gelb, 1997). Healthcare is not immune to experiencing innovation, especially when it comes to technology, but it is susceptible to user attitudes of adoption and is prone to being outcome-based (Blue, 2006).

Today, the marketplace is inundated with devices and mobile apps that track fitness, sleep, nutrition, and basic metabolic parameters. While this means consumers can be armed with self-monitoring data collected from these devices, it is unclear if such information is of value and is acceptable to healthcare providers for addition to the electronic medical record (EMR), which is used

for diagnosis and treatment. Thus, understanding the attitudes of healthcare providers toward self-monitoring devices (SMD) can have significant value in the fields of user-computer interaction, HIT application, development, and use and for providers themselves to determine how best to integrate this now-ubiquitous technology into practice.

Models have been developed by researchers for the exact purpose of understanding and predicting technology usage. The Unified Theory of Acceptance and Usage of Technology (UTAUT) was developed to explain the high variances seen with the predictability powers of the technology acceptance model (TAM) and includes many tenets of the Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB). The UTAUT includes constructs for performance expectancy, effort expectancy, social influence, and facilitating conditions as well as moderators of gender, age, experience, and voluntariness of use as they impact behavioral intention (Venkatesh, Morris, Davis, and Davis, 2003). Venkatesh, Thong, and Xu (2012) introduced the UTAUT2 based on assumptions and data regarding consumer usage. The UTAUT2 adds the constructs of hedonic motivation, price value, and habit and removes the moderator of voluntariness. These additional constructs provide further insight into consumer usage of IT. Because of this focus on consumer usage, the UTAUT2 model may be a better predictor of consumer-IT habits; thus, it was chosen as the tool of choice in this study to look at the impact of consumer healthcare devices and the attitudes of technology acceptance among physicians as it relates to SMDs.

STATEMENT OF THE PROBLEM, PURPOSE, AND RATIONALE OF THE STUDY

The research literature on technology acceptance indicates that data from technology will be used by healthcare providers if it is beneficial, but it is not known whether the performance expectancy, effort expectancy, social influence, facilitating conditions, and moderating variables (gender, age, and experience) impact behavioral intention and, ultimately, provider use behavior regarding SMDs. Consumers can present information to healthcare providers who, in turn, may be able to use it to develop, diagnose, and treat the patient. The study problem the researcher intended to address is the extent to which healthcare providers' use of SMD information may be influenced by their concerns about health information technology (HIT). The purpose of the study was to understand behavioral intention and use behavior of physicians when it comes to consumer healthcare devices.

Research Questions for the Study

Based on the problem statement and purpose of the study, the researcher formulated the following primary research question: "Do the constructs in the UTAUT2 model predict healthcare providers' behavioral intentions and use of SMD for EMR?"

Significance of the Study

Studying the factors that influence SMD usage by healthcare providers is significant for enhancing their effectiveness for consumers. Traditional methods, such as the use of longitudinal medical records and hospitalization records, are costly and time-consuming. While several technology-based solutions have been suggested to help track and monitor patients' health, most are limited to in-patient hospital settings, while a large amount of valuable patient data takes place in an out-patient setting (Gupta, Woosley, Crk, & Sarnikar, 2007). SMDs allow tracking and recording of patient data outside the hospital setting and give healthcare providers details that they would not traditionally have. For example, with the help of SMDs, healthcare providers can offer better patient care by referring to programmed reminders and alerts and other computerized features of guided treatments for specific diseases (Rastogi, Daim, & Tan, 2008). This study will help determine the factors that influence whether or not healthcare providers will include SMD data as part of the EMR. That information can be used in future HIT development and marketing.

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