

# Chapter 27

## Using an Extended Theory of Planned Behavior to Study Nurses' Adoption of Healthcare Information Systems in Nova Scotia

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### ABSTRACT

*This study used the theory of planned behavior (TPB), which was extended to include relevant constructs such as computer self-efficacy, anxiety and habit, to investigate registered nurses' (RNs') adoption of healthcare information systems (HIS) in Nova Scotia, Canada. An analysis of data collected from 197 RNs in a cross-sectional survey showed that their attitudes towards HIS were positively impacted by computer self-efficacy and computer anxiety (lack thereof). RNs' attitudes toward HIS and facilitating organizational conditions significantly influenced intentions to use HIS at work. Contrary to prediction, subjective norm did not influence RNs' intentions to use HIS in the research setting. Computer habit mattered for RNs' acceptance of HIS. Information from the study benefits the management of RNs' HIS use in Nova Scotia, in particular, and comparable parts of Canada and the world.*

### INTRODUCTION

Healthcare information systems (HIS), such as clinical decision support systems (CDSS), enterprise or electronic medical record (EMR) systems and electronic health record (EHR) have become valuable assets to clinicians across the world (Silva & Ball, 2002; Kuhn et al., 2006; Combs, 2006; Ludwick & Doucette, 2009; Buntin et al., 2011; Lee et al., 2013). It is accepted that healthcare computing systems provide tangible benefits to healthcare delivery, yet studies have reported that clinicians, including nurses, have not readily accepted HIS and related technologies in work environments (Timmons, 2003; Paré et

DOI: 10.4018/978-1-5225-5490-5.ch027

al., 2011; Montague et al., 2013). In particular, nurses' underutilization of, and resistance to healthcare technologies are well-documented (Timmons, 2003; Paré et al., 2011; Montague et al., 2013; Griebel et al., 2013).

Underutilization of technologies in healthcare settings is unfavorable given vast amount of money spent to procure such tools (Kuhn et al., 2006; Buntin et al., 2011). Moreover, the gains of HIS will not be fully realized if the people expected to use such applications resist them. Healthcare facilities that do not use HIS efficiently will lose the trust of their patients and be deemed not fit for purpose (Kuhn et al., 2006; Buntin et al., 2011; Lee et al., 2013). Studies designed to investigate factors that positively influence healthcare professionals' use of HIS and related technologies in healthcare settings merit commendation (Timmons, 2003; Ludwick & Doucette, 2009; Paré et al., 2011; Montague et al., 2013; Lee et al., 2013). To enrich theory development, it is important for perspectives from different parts of the world be entertained.

Theoretical frameworks including the Technology Acceptance Model (TAM) (Davis, 1989), Theory of Planned Behavior (TPB) (Ajzen, 1991), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) have been used to investigate clinicians' information systems (IS) adoption or acceptance (Ammenwerth et al., 2003; Dillon et al., 2005; Aggelidis & Chatzoglou, 2009; Asua et al., 2012; Maillet et al., 2015). In a comprehensive review of healthcare studies that used TAM, Holden and Karsh (2010) concluded that this particular framework is limited in composition and may benefit from the addition of relevant constructs or factors. Contrastingly, TPB and UTAUT offer more comprehensive perspectives and have started to gain popularity among healthcare researchers (Chau & Hu, 2002; Dillon et al., 2005; Aggelidis & Chatzoglou, 2009; Schaper & Pervan, 2007; Asua et al., 2012).

In this study, TPB is employed as it encompasses such factors as social influence and facilitating organizational conditions which prior studies have shown to be critical for healthcare professionals' adoption of HIS and related technologies (Aggelidis & Chatzoglou, 2009; Holden & Karsh, 2010; Montague et al., 2013; Asua et al., 2012). Additionally, research that compared TPB with TAM found the former to be more powerful and parsimonious than the latter (Chau & Hu, 2002). This study did not use UTAUT because some of the variables considered in this study were not included in that framework due to the full mediation effects of some of the items over others in that model (Holden & Karsh, 2010). For example, attitude was not included in UTAUT; yet, several studies that examined the impact of healthcare professionals' attitudes on information systems (IS) acceptance demonstrated the influencing role of that construct (Holden & Karsh, 2010; Maillet et al., 2015).

By employing the aforementioned theoretical frameworks, healthcare researchers have produced a vast amount of useful information on healthcare professional's acceptance or adoption of IS or HIS (Paré et al., 2011; Griebel et al., 2013; Asua et al., 2012; Maillet et al., 2015). Regardless of the theoretical model or framework favored by researchers, healthcare researchers (Holden & Karsh, 2010) have signified the need for attention to be paid to issues of concern specific to healthcare workers. Heeding this advice, an informal study was conducted in this study's location, i.e., Nova Scotia, Canada, to ascertain RNs' views on salient factors likely to impede the adoption of mandated technologies such as HIS, at work. This informal study solicited the participation of six (6) RNs in the province. In fact, one participant was a former head of the provincial RNs' association. Among other concerns, participants stressed the inability to effectively use ever-changing healthcare technologies due to the age of RNs, less than desir-

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