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Human Factors Affecting HMS Impact on Nurses Jobs:
HMS Impact in Nursing

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ABSTRACT

To improve and facilitate patient care, hospital administrators have implemented healthcare management systems (HMS). Unfortunately, many hospitals have encountered HMS implementation problems. Some user-related factors have been proposed in the literature as important to system success. This study proposes an integrative model and empirically tests the importance of these variables as determinants of HMS impact on the jobs of nurses. Data from 213 nurses using their hospital HMS has been used to test the relationships between the independent variables and the HMS impact on the nurses' jobs. The results confirm the importance of nurse participation, training, good communication with developers, and lack of conflict regarding system implementation enabling a more desirable effect of HMS on nurses' jobs. Based on the results, recommendations are made for hospital administrators to improve the likelihood of HMS implementation success.

KEYWORDS

Healthcare Management Systems (HMS), HMS Impact On Nursing, HMS Implementation, Hospital Innovation

INTRODUCTION

Healthcare information technology in general has been considered as an important factor to reduce costs and improve the efficiency and safety of the health care sector (Fujino & Kawamoto, 2013; McBride, Delaney & Tietze, 2012). Specifically, Healthcare Management Systems (HMS) provide support to many clinical and administrative activities/tasks in a wide variety of hospital areas such as radiology, anesthesia, pathology, emergency medicine, billing services, appointment scheduling, refunds, etc. Within each of these areas the HMS may also be used to support a wide variety of tasks. For example, in radiology alone it may be used for electronic downloads of patient demographic data and to download radiology reports into HMS billing software, on-line coding of transcribed radiology reports, claim submission, posting of remittance notifications, etc. While some hospitals develop some HMS components in-house, most acquire integrated collections of various HMS software/service components commercially available from many vendors. Therefore, in a given hospital the comprehensiveness of the HMS support can vary widely and so can the difficulty of implementing such systems if managers are not careful about the potential implementation problems (Glaser, 2011; Yamazaki, Ikeda, & Umemoto, 2011). Despite continuous efforts to improve hospital productivity and service quality by using information technology (IT), many system implementation problems remain (Bolan, 2011; Glaser, 2011). Perhaps because of HMS's integrative nature, they tend to be relatively large, expensive systems, normally dictated from above. These characteristics often lead to

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unwanted and poorly managed changes. As hospitals' dependence on information systems increases, so does the need to ensure that they perform according to specifications and/or user needs and wants. Primarily for this reason we targeted HMS in this study.

While the reasons for system failure or less than successful system implementation are many, given the increasing hospital IT expenditures, improving system success is of critical importance (Grenuk, 2011). One issue becomes how to measure system success. The more widely used ways are an extent of system usage, user satisfaction with the system, and benefits derived from using the system, the amount or frequency of system usage, and the impact that specific systems have on end-user jobs. Which one represents the best measure of success depends on the objective of the study. According to the literature, there is an urgent need for understanding the issue of nurse retention and turnover (Currie & Hill, 2012; Nei, Snyder, & Litwiller, 2014); and also why nurses have been relatively slow embracing the use of computer technology while performing their jobs (Cross & MacDonald, 2013). Thus, similar to the motivation of previous studies regarding information systems impact on end-user jobs (Yoon & Guimaraes, 1995; Yoon, Guimaraes, & Clevenson, 1996), we chose it as the dependent variable. If hospital administrators can improve organization performance along the HMS development and implementation user factors leading to more positive impact on nurses' jobs, that are likely to help improve nurses' adoption of computer technology in general, and hopefully help improve the problems of nurse retention and turnover mentioned above. Thus, we selected nurses as the subjects for this study.

The importance of user satisfaction with and the job impact from their information systems is widely recognized and cannot be overestimated given the enormous amount of hospital resources spent in this area, and the degree of dependence on the increasing collection of system applications (Hart, 2011; Metaxiotis, 2006). However, there remain some important questions, which this research tries to address: Will nurses' job impact be affected by some of the same variables found important to general system success? How important are some human related factors such as nurse training and participation in system implementation, as well as other user characteristics as determinants of job impact from HMS implementation and use. The importance of user participation in systems implementation as an important ingredient for system success in general has been studied before (Hwang & Thorn, 1999; Mahmood, Burn, Gemoets, & Jacquez, 2000; Metaxiotis, 2006; Subramanyan, Weisstein, & Krishnan, 2010). One may expect that finding evidence to corroborate the essential role that users play during system development/implementation should be a simple matter. Surprisingly, this is not the case. While the majority of research evidence finds user participation/involvement correlated with various measures of system success (Hwang and Thorn, 1999; Mahmood et al., 2000; Subramanyan et al., 2010), the literature has often presented conflicting results. Some studies have shown user participation to be positively correlated with system success, negatively correlated with system success, and sometimes non-significantly correlated with system success (Brodbeck, 2001; Chen, Yu-Chih Liu, & Chen, 2011). As mentioned above other user characteristics beyond mere participation in the system development process have been found to be important factors by various authors.

Depending on hospital administration hiring, training, and cultivating these factors, which are believed to be important determinants of nurse satisfaction with their HMS, their behavior toward HMS, may range widely from avoidance, to reluctant usage, to using it often as a productive tool. To complicate matters, as discussed earlier, because HMS is expected to provide operational support for many vital hospital services, in many cases its usage is required regardless of any particular group's satisfaction with the system. The main objective of this study is to test the relationships between the human related factors mentioned above with a favorable HMS impact on the nurses' jobs. In the next section, we define the primary constructs studied here (HMS job impact, user participation, user expertise, user/developer communication, user training, user influence, and user conflict). We explain the nature of each variable and respectively propose testable hypotheses. Following that, we explain the methodology used and present the results of our tests. Finally, we discuss the implications of the results for managers and researchers.

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