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Patient-centered information system to enhance patient experience for the elderly and provide strategic advantage for the provider

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Abstract

Despite the widespread provider acceptance of health information systems (HIS), there is little empirical evidence and no clear understanding that patient-centered HIS enhance the patient experience. This is especially true for elderly patients, whose involvement in their own care, through the use of a HIS, may have a major impact on their experience. In this study, we review opportunities for developing HIS features that support the integration of services for elderly patients while providing strategic advantages for the provider. We use the customer resource life cycle (CRLC) concept to identify the needs of patients at all stages of dealing with provider throughout the care delivery. To do so, we developed a scale that contained multiple statements for each of the 13 stages of CRLC. Then, using Q-methodology, we asked elderly patients to sort the statements in regard to HIS features that they would find beneficial if they were available to them. Using partial least squares (PLS) analysis, we tested our structural model and hypotheses and found that the perceived benefit of a patient-centered HIS has a direct effect on perceived patient experience when mediated by patient education.

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1. Introduction

Information technology, as inclusive of certain operational characteristics, has long been viewed as providing a strategic advantage and significant economic impact for organizations across industries¹⁻⁵. This view has been the foundation of information system design studies that go back decades^{6,7}. Organizations came to recognize that enabling the customer to be involved in every stage of the service or product purchase through information systems,

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from helping to establish the need for the product to the disposal of it, enhances the customer-provider relationship. It is the relationship between the provider and customer that offers a strategic advantage⁶. In regard to this relationship, Porter's five competitive forces guide organizations in gaining a competitive edge. McLaughlin⁸ explains how strategically designed information systems (ISs) can add value over the cost, and Benjamin et al.⁹ noted that IS use, to be strategic, needs to be customer-centered. Finally, Notowidigdo⁷ stated that strategic IS can be viewed as an internal system with a direct impact on the way that the organization operates, and as an external system that has an impact on customers through enhanced offerings that result in customer loyalty.

Involving patients and build a relationship with them is especially important in healthcare because patients often feel not in control to diagnosis and treatment decision due to limited information while under the care of a provider¹⁰. Involving patients in their care and providing access to information and support throughout the healthcare process has been shown to increase patients' confidence in diagnosis and treatment decisions, compliance, and, ultimately, satisfaction with their care^{11, 12}. Further, as noted, providers can distinguish themselves by using a patient-centered HIS.

Nevertheless, little attention has been paid to patient-centered HISs. With the proper features and support, providers can build a relationship with and the loyalty of customers. This is especially true for elderly patients, who often need more frequent and involved care. A patient-centered HIS may help the elderly to better understand the care that they receive, conveniently get answers to their questions, and receive support.

This study aims to determine the patient-centered HIS features that are perceived as beneficial for elderly patients and that, in turn, can enhance the patient experience. To this end, the study is guided by the following research questions:

- *What are the patient-centered HIS features that are perceived to be beneficial for elderly patients?*
- *How does patient-centered HIS relate to perceived patient experience?*

We propose a structural model to reveal the relationship among the identified constructs and to empirically validate the proposed hypotheses. We also discuss the practical and theoretical implications of the findings.

2. Research design and methods

To evaluate patient-centered HIS features that are perceived to be beneficial by the elderly and how patient-centered HIS relates to perceived patient experience, we took the following steps:

1. We interviewed 12 elderly patients (65 years and above) on their expectations of how a patient-centered HIS would benefit them. We defined patient-centered HIS to them as an IS, specifically, a computerized application, that is supportive of individual patient needs, preferences, and values throughout the entire care process across providers and departments.
2. We matched their input with the 13 stages of the CRLC to ensure that all input corresponded with one of the stages. CRLC is a framework to support relationship development with customers throughout the life cycle of the service or products that they acquire from a supplier⁶. In the healthcare context, we identified the provider as the supplier, the patient as the customer, and the care that patients receive as the services.
3. Using Q-methodology, we created 39 Q-sorts, which were statements generated from the 13 stages of CRLC, with three statements for each stage. We then asked another sample of 68 elderly patients to indicate whether they agreed or disagreed with the statements and to place them into a pre-defined layout of a Q-sort score sheet. This allowed us to identify the subjectivity in regard to HIS features found important by groups of elderly patients who share highly similar statement rankings.
4. We performed by-person factor analysis to identify the groups who share highly similar and distinguished viewpoints on the importance of certain stages of the CRLC framework. Those stages that were found important (ranked as "highly agree") were hypothesized to be positively related to the perceived benefits of a patient-centered HIS. Then we hypothesized that the perceived benefits of a patient-centered HIS would be positively correlated with perceived patient experience if those stages were supported by specific HIS features
5. We developed the theoretical model that captures the result of the Q-methodological approach and our proposed hypotheses. We also measured the mediating effect of patient education/support.

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