



# Development and validation of a scale to assess attitudes of health care administrators toward the use of e-mail communication between patients and physicians

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## Abstract

*Background:* The medical profession has been slow in embracing the e-mail as a means of improving patient communications. Today, most physicians work in group practices where administrators seek to develop standard procedures for care delivery. To understand the slow adoption of e-mail technology among physicians when communicating with their patients, it is important to understand these administrators' attitudes.

*Objective:* The purpose of this study was to develop and purify a scale to measure health care administrators' attitudes toward the use of e-mail communication and identify associations between e-mail communication attitudes and administrators' demographic and practice-related characteristics.

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**Methods:** A preliminary list of features for e-mail communication was generated by reviewing the literature and Rogers' diffusion theory. The features were grouped initially into 5 hypothesized dimensions: relative advantage, norms (established rules of the social system), complexity, compatibility, and infrastructure. Following pilot testing, the main survey instrument was mailed to a total of 1500 health care administrators. Attitudes toward features of e-mail communication scale were analyzed using exploratory factor analysis with promax rotation. Internal consistency of the scale and its subscales was determined using Cronbach's alpha and item-total correlations.

**Results:** The overall response rate was 8.7%. Scale purification procedures reduced the preliminary scale of 22 items to a final scale of 20 items. The reliability of the scale measured by Cronbach's alpha was 0.81. Norms was considered the major barrier to e-mail communication, whereas infrastructure was considered a facilitator, and other features like relative advantage, complexity, and compatibility issues were perceived more as a barrier than a facilitator. The item related to and usage of e-mail by staff was statistically significant with the overall scale score ( $P = 0.0095$ ), complexity subscale score ( $P = 0.0168$ ), and infrastructure subscale score ( $P = 0.0480$ ). The relationship between number of years of experience of the administrator and infrastructure subscale score was statistically significant ( $P = 0.0480$ ).

**Conclusion:** A scale developed to determine the attitudes of health care administrators regarding e-mail communication between patients and physicians demonstrated adequate content validity and reliability.

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**Keywords:** E-mail; Health care administrators; Diffusion of innovation theory

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## 1. Introduction

Communication between patient and physician is a key element in determining patient satisfaction and health outcomes.<sup>1</sup> In addition to traditional modes of communication like face-to-face encounter, telephone, mailed and faxed letters, telemedicine technologies such as videoconference, and e-mail are also evolving.<sup>2</sup> Patient-provider e-mail is being defined as "computer based communication between clinicians and patients within a contractual relationship in which health care provider has taken an explicit measure of responsibility for the clients' care."<sup>3</sup> Benefits of using e-mail over traditional modes of communication include elimination of the so called phone tag, augmenting information that was overlooked during office visits and addressing issues patients would normally not express in other forms of communication.<sup>2,4</sup>

Many patients find great value in e-mail communications with their physicians, although relatively few physicians use e-mail to communicate with their patients on a regular basis.<sup>2,5,6-9</sup> Patients perceive that e-mail

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