Development and Initial Validation of an Instrument to Measure Physician–Pharmacist Collaboration from the Physician Perspective

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ABSTRACT

Objective: Using a conceptual model of collaborative working relationships between pharmacists and physicians, a measure for physician–pharmacist collaboration from the physician perspective was developed. The measure was analyzed for its factor structure, internal consistency, construct validity, and other psychometric properties.

Methods: An initial 27-item Physician–Pharmacist Collaboration Instrument (PPCI) was developed to assess seven themes about professional relationships using Likert scales. The PPCI was mailed to a random sample of 1000 primary care physicians. Principal component analysis was used to assess the structure and uncover underlying dimensions of the initial instrument. Items were evaluated for inclusion or exclusion into a refined instrument. Internal consistency was assessed by calculating Alpha coefficients for each identified factor. Convergent validity was assessed using Spearman correlations between the identified factors and a previous measure of collaborative care. After measure refinement, confirmatory factor analysis was used to evaluate the fit of both versions of the instrument.

Results: Three hundred forty usable surveys were returned for a response rate of 34%. Almost 70% of the respondents were male with a mean age of 45.8. A majority were family practice physicians (72.1%) in private practice (67.3%). Three unique factors were identified during principal component analysis and utilized in a confirmatory factor analysis. Both a full and a 14-item reduced model were constructed and tested. Cronbach's alpha for the three factors of the full model ranged from 0.91 to 0.97, while the reliability for the reduced model ranged from 0.86 to 0.96. Comparative fit indexes of 0.97 and 0.98 were obtained, indicating good fit for the models.

Conclusions: The results indicate good reliability and validity of the refined (14-item) PPCI. This instrument can be useful as a research tool for assessment of the physicians' perspective about a physician–pharmacist relationship. Further research is warranted to examine if the extent of relationship development, as measured with the PPCI, can affect patient care outcomes.

Keywords: collaboration, communication, coordinated care, physician–pharmacist relationship.

Introduction

Collaboration among health care professionals has been defined as a "joint communicating and deci-

sion-making process with the goal of satisfying the patient's wellness and illness needs while respecting the unique qualities and abilities of each professional" [1]. This definition can be reflected in relationships between physicians and pharmacists. Numerous studies have concluded that coordinated care between physicians and pharmacists can improve patient care outcomes [2–9]. Likewise, reports of pharmacists' activities indicate that collaborative practice with physicians is occurring frequently [5,10–14]. In fact, recent position articles by the American College of Physicians—American

Society of Internal Medicine and the American College of Clinical Pharmacy support physician–pharmacist collaboration for managing medication [15].

Nevertheless, the degree of collaboration that occurs between an individual physician and pharmacist can vary greatly. For patients to benefit from physician–pharmacist collaboration, its effect on patient care outcomes needs to be understood. As a research tool, a valid measure of collaborative care may help explain different levels of success among collaborative health-care service interventions. It is possible that patient health-care outcomes are related to the degree of collaboration between health-care providers. To date, there has been no measure to assess the degree of collaboration between a physician and pharmacist. Recently, a theoretical framework of physician–pharmacist collaborative relationships has been developed [16]. Based on this theoretical framework, the objective of the present study was to develop, refine, and test the reliability and validity of a measurement tool for physician–pharmacist collaboration.

In the theoretical framework, collaborative relationships are developed through five progressive stages: Stage 0—Professional Awareness; Stage 1—Professional Recognition; Stage 2—Exploration and Trial; Stage 3—Professional Relationship Expansion; and Stage 4—Commitment to the Collaborative Working Relationship. Contributions of both physician and pharmacist allow the relationship to grow, with higher stages representing an expanded relationship. Certain variables, such as the nature and scope of social exchange drive the development of a collaborative relationship.

Interactions among physicians and pharmacists are viewed as exchanges. At Stage 0, exchange is minimal while Stage 1 exchange is mostly unilateral or driven by one party. As the relationship progresses, the exchanges become bilateral in which both parties are active. Stage 4 represents a committed and sustained relationship characterized by bilateral communication and mutual trust. In this model, delivery of health-care services by a pharmacist expands as the stage of collaboration increases. Consequently, pharmacists may need to operate in higher stages of this model to deliver health care services that affect patient outcomes.

The theoretical framework formed a basis to construct a 27-item questionnaire to measure physicians' views of physician–pharmacist collaborative relationships. The items on the questionnaire were designed to assess the nature and scope of social exchange that drive the relationship. Before employing this questionnaire to evaluate effects on

patient care outcomes, the purpose of the current study was to subject the instrument to rigorous validation testing.

Methods

Items on the Physician–Pharmacist Collaboration Instrument (PPCI) were developed to capture the nature and scope of social exchange which drive a professional relationship. These items were crafted based on seven themes surrounding a professional relationship: collaborative care, commitment, dependence symmetry, bidirectional communication, trust, initiating behavior, and conflict resolution.

Item measures were developed using literature from interpersonal, business, and health-care relationships [17–34].

Six of the seven concepts were measured using a seven-point Likert scale with respondents indicating 1 (very strongly disagree) to 7 (very strongly agree) for each item. The intermediate points on the scale were also defined from strongly disagree to strongly agree. Respondents were asked to consider their relationship with the pharmacist whom they work most often. They were told to respond to each item based on the interactions with this pharmacist over time. The other concept, initiating behavior, was measured on a five-point scale (1 = not at all, 5 = to a great extent). The respondent was asked to indicate the extent to which the pharmacist had performed each of five activities.

An initial draft of the concept definitions and items was distributed to five physicians who were known to have interaction with pharmacists. These physicians were asked to provide comments related to the face validity of the instrument. Subsequent revisions to the items followed the feedback on face validity provided by these physicians.

A pilot test of the 27-item questionnaire was conducted. One hundred and ten physicians affiliated with the University were asked to complete the questionnaire. In addition, the physicians were asked to complete a separate nine-item instrument as an initial test of construct validity. This second instrument (i.e., Baggs) had been originally designed and validated to measure collaboration and satisfaction about care between physicians and nurses [17]. The Baggs measures were modified slightly to reflect a pharmacist perspective rather than a nurse. Sixty-eight surveys (61.8%) were returned. Results from the pilot testing indicated that the items had good internal consistency [35]. Also, the seven concepts were significantly, positively correlated among