

## The Causal Relationship between Interns' Knowledge and Self-Efficacy and Their Value in Predicting the Interns' Communication Behavior with Patients

Saeideh Ghaffarifar<sup>1</sup>, MD, PhD; Fazlollah Ghofranipour<sup>2</sup>, PhD; Fazlollah Ahmadi<sup>3</sup>, PhD; Manouchehr Khoshbaten<sup>4</sup>, MD; Chris Sallis<sup>5</sup>, MSc

<sup>1</sup>Medical Education Research Center, Tabriz University of Medical Sciences, Tabriz, Iran, Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran;

<sup>2</sup>Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran;

<sup>3</sup>Department of Nursing, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran;

<sup>4</sup>Department of Liver and Gastrointestinal Diseases, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran;

<sup>5</sup>Department of College Preparatory English, Vancouver Community College, Vancouver, BC, Canada

### Corresponding author:

Fazlollah Ghofranipour, PhD; Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Po Box: 14115-111, Tehran, Iran

Tel/Fax: +98 21 82883869; Email: ghofranf@modares.ac.ir

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### ABSTRACT

**Background:** After many years of teaching, both the efficiency and efficacy of communication skills programs are under question because patients' dissatisfaction with doctors' communication behavior is at the top of the complaint lists. It is assumed that finding the specific role of different determinants of doctors' communication behavior, instructional designers can plan more effective training programs. This study aims to explore the predictive value of interns' knowledge and self-efficacy in building effective relationship with patients and determine the causal relationship between interns' knowledge and self-efficacy about effective doctor-patient relationship.

**Methods:** In this cross-sectional study, PRECEDE model was applied and the analyzed content from semi-structured interviews with 7 interns and 14 faculty members was combined with the items from literature review. All the emerged items were categorized under eight constructs of social cognitive theory. The validity and reliability of the items of the research questionnaire were examined by 40 interns and an expert panel of 14 faculty members. The questionnaires were completed by 203 medical interns and confirmatory factor analysis (CFA) was done on the items. The data were analyzed by SPSS.21 and LISREL 8.80.

**Results:** CFA indicated a good fit to the data. Knowledge and self-efficacy, together, explained 23 percent of the variance in interns' communicative behavior. 53 percent of the changes in interns' self-efficacy were attributed to the changes in interns' knowledge.

**Conclusion:** Improving the interns' shared vision can increase the quality of their knowledge and instructional designs based on learning facts, and gaining insights about effective doctor-patient relationship can increase the interns' self-efficacy and consequently improve the interns' communication skills.

**KEYWORDS:** Knowledge; Self-efficacy; Interns; Doctor-patient Relationship; Communication skills

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## INTRODUCTION

In the overview of systematic reviews, outcome measures of the effectiveness of communication skills programs were patients' satisfaction, their obedience to the medical decisions, and physicians' self-confidence and self-efficacy.<sup>1</sup> Moreover, the findings of some studies have revealed the relationship between the doctors' communication skills and patients' satisfaction with medical services. For instance, qualitative content analysis of eight research reports revealed that patients' dissatisfaction with both the quality and quantity of the doctor-patient relationship is still at the top of the patients' complaint list.<sup>2</sup> In other words, despite many invaluable endeavors to provide the medical students with the best training courses in communication skills,<sup>3</sup> communication skills programs are not as effective as they are intended to be and increasing rate of the patients' dissatisfaction is an objective indicator of physicians' undesirable communication skills. It is assumed that finding the factors, which influence the effectiveness of doctor-patient relationships and designing the interventions based on those factors, would improve the physicians' doctor-patient communication skills and consequently would augment the patients' satisfaction with doctors' communication behavior. Believing that some theory-based studies are needed to find the physicians' behavioral indicators of an effective doctor-patient relationship, researchers conducted a mixed-method study to evaluate an intervention applying PRECEDE PROCEED model on interns' doctor-patient communication behavior and their patients' satisfaction. The emerging data from directed interviews with respondents were categorized under eight constructs of social cognitive theory<sup>4</sup> (SCT).<sup>5</sup> This article discusses the relationship between two of those eight constructs, knowledge and self-efficacy of interns, in communicating with their patients.

According to the theory of self-efficacy, it is attributed to individuals' beliefs in their capabilities to follow a given behavior successfully.<sup>6</sup> In addition, teaching and

implementing useful strategies to build perceived self-efficacy can lead to considerable improvements in job-related outcomes such as self- and customer satisfaction.<sup>7-9</sup>

While reviewing the videotapes, researchers provided 53 internal medicine residents with some feedback on their doctor-patient communication skills, immediately after they visited a simulated patient (SP) in an objective structured clinical examination (OSCE) station. For the most part, residents had poor communication skills and did not believe in their proficiencies to successfully communicate with the SP in the OSCE station.<sup>10</sup>

In a study, doctors' self-efficacy in building a relationship with patients was increased from 6.85 to 7.84 ( $P < 0.001$ ) by communication skills training.<sup>11</sup> In previous studies, different determinants of doctor-patient communication behavior, such as physicians' knowledge and self-efficacy and the relationship between them, have not been scrutinized. In addition, finding the relationship between physicians' self-efficacy and the other determinants of their communication behavior has been suggested.<sup>12</sup> The authors of a study, applying SCT, have investigated the relationship between nurses' knowledge and self-efficacy and have not reported a statistically significant relationship between the nurses' knowledge and self-efficacy.

This paper aims to explore the relationship between medical interns' knowledge about establishing an effective relationship with patients and their self-efficacy, as a part of a larger study, based on PRECEDE<sup>13</sup> model and social cognitive theory (SCT).

## METHODS

### *Design and Data Collection*

This cross-sectional study as a part of a larger study, based on PRECEDE<sup>13</sup> model and social cognitive theory (SCT) was conducted in 2014 at medical schools of Tehran and Shahid Beheshti Universities of Medical Sciences, Iran. Totally, 203 interns, who were willing to participate in the study, were recruited

using convenience, non-probability sampling. They were informed about their right to withdraw from participation at any time. Applying PRECEDE model, we conducted semi-structured interviews with both interns and teaching faculty members in order to investigate their insights about building an effective relationship between patients and physicians. During the planning phase of the PRECEDE model,<sup>14</sup> barriers to effective doctor-patient relationship were identified.<sup>4</sup> PRO factors (Predisposing, Enabling and Reinforcing factors) of interns' communication behavior as well as social and behavioral indicators of interns' successful relationship with their patients were considered. Hence, researchers figured out what was exactly happening in interns' real learning context.

The contents of the interviews were combined with the items from review of literature about doctors' communication skills. The resulting items were cultivated in order to be classified under the suitable constructs of the theories in HEHP. 203 questionnaires were filled out by interns (response rate was: 83 percent).

*The Questionnaire*

The language of the research questionnaire

was Persian. The condensed meaning units, which emerged from interviews, were combined with those from review of literature. (It resulted in a bank of 71 items in all). Social Cognitive Theory (SCT) was employed to categorize the items into different constructs. In doing so, interns' communication behavior was defined with eight constructs of SCT.<sup>4</sup> This article describes only two constructs of interns' doctor-patient communication behavior and not the other six constructs.

The construct of knowledge: it measured the interns' "learning of facts" and "gaining of insights" related to building an effective relationship with patients<sup>15</sup> and contained 12 items. The interns evaluated each item on a five-point Likert scale (1: never, 2: seldom, 3: sometimes, 4: usually and 5: always).

The construct of self-efficacy: it measured the interns' confidence in their capability to follow an effective relationship with patients<sup>6</sup> and included 11 items. The participants assessed each item on the same scale as for knowledge. The items for measuring the interns' knowledge and self-efficacy as to building effective doctor-patient relationship are displayed in Tables 1 and 2, respectively.

**Table 1:** Items used for measuring the interns' knowledge

Item	Mean±SD	Possible Score
A physician can interrupt the patient in order to correct him/her mistakes	2.96±0.50	1 to 5
A physician can judge patient's narrative	2.70±0.58	1 to 5
Physicians start a consultation with an open question	2.90±0.59	1 to 5
Physicians educate important information first	3.10±0.78	1 to 5
Physicians restate facts and orders in different ways	2.75±0.51	1 to 5
Physicians educate patients with understandable examples(e.g. you can consume "6 spoonfuls of rice" instead of "low rice")	2.75±0.51	1 to 5
Physicians personify the ways of behavior change with clear and feasible examples(e.g. you should "wear sandals at home" instead of "care for your foot")	3.00±0.83	1 to 5
Physicians clarify the logic of adopting healthy life style	2.93±0.73	1 to 5
Physicians select treatment plans in proportion with patient's life style, if possible	3.01±0.87	1 to 5
Physicians educate about barriers to behavior change, as well as the ways of struggling against them	2.91±0.77	1 to 5
Physicians introduce examples of their previous patients, who have succeeded in treatment and behavior change, to their new patients	3.21±1.01	1 to 5
Physicians ask patients to repeat the important discussed issues during the consultation	3.18±1.04	1 to 5
<b>Total Score</b>	<b>35.39±6.13</b>	<b>12 to 60</b>

\*Higher values indicate better knowledge

**Table 2:** Items for measuring the interns' self-efficacy

Item	Mean±SD	Possible Score
I can provide structure to the interview	2.82±0.695	1 to 5
I can manage a time-oriented consultation as my professional responsibility	2.67±0.532	1 to 5
I can explore patients' problems	2.78±0.919	1 to 5
I can use brief, easy and jargon-free phrases	2.82±0.795	1 to 5
I can employ proper body language	2.88±0.980	1 to 5
I can give support to the patient in order to discover his/her concerns	2.98±0.959	1 to 5
I can uncover patients' information about a topic and his/her willingness to learn more	2.67±0.626	1 to 5
I can share the diagnosis and treatment plan with patients	2.80±0.767	1 to 5
I can find out patient's understanding about discussed issues during the consultation	2.66±0.561	1 to 5
I can clarify patient's responsibilities to follow the agreed plans	2.72±0.649	1 to 5
I can close the session after summarizing the important information around diagnosis, prevention and treatment	2.41±0.532	1 to 5
<b>Total Score</b>	<b>30.21±4.94</b>	<b>5 to 55</b>

\*Higher values indicate better self-efficacy

### Statistical Analysis

#### Validity

Qualitative face validity of the questionnaire was examined by 40 medical interns. Both quantitative face validity and content validity of the research questionnaire were evaluated by 14 experts of Medicine and Health Education and Health Promotion. In order to measure the quantitative face validity, impact score (IS) for each item was calculated and IS greater than 1.5 was considered suitable. Content Validity Ratio(CVR) greater than 0.51<sup>15</sup> and Content Validity Index(CVI) greater than 0.79<sup>16</sup> were acceptable. Having the theoretical framework of SCT, exploratory factor analysis (EFA) was skipped.<sup>17</sup>

Confirmatory factor analysis (CFA) was performed on 203 questionnaires. Doing CFA, both construct validity and the magnitude and significance of the theory-based assumed causal relationships among different constructs were tested. This article, as a part of a larger study, based on PRECEDE<sup>13</sup> model and social cognitive theory(SCT), discusses the findings about 2 constructs, knowledge and self-efficacy. Fitness of both measurement and structural models to the data was assessed by acceptable fit indices: the root mean square error of approximation (RMSEA)  $\leq 0.08$ , the relative Chi-Square statistic ( $\chi^2/df$ )  $\leq 3$ , Normed Fit

Index(NFI), Non-Normed Fit Index(NNFI), Comparative Fit Index(CFI) and Incremental Fit Index(IFI)  $\geq 0.90$ , and Root Mean Square Residual(RMR) around zero.<sup>18,19</sup>

#### Reliability

Internal consistency of each construct was tested by the Cronbach's Alpha Coefficient and composite reliability of the constructs was measured based on the findings from CFA.

#### Regression Analysis

The causal relationship between the interns' knowledge and their self-efficacy was investigated by univariate linear regression analysis. The data from completed questionnaires was analyzed using SPSS for windows version 21.0 and LISREL 8.80. The P value was set at 0.05.

#### Ethics

The ethical approval for this research was obtained from Tarbiat Modares University's Ethics Committee. Participants were informed of both the objectives of the study, confidentiality of their information, and their right to withdraw from participation at any time.

## RESULTS

In all, 203 interns participated in the study

(response rate: 83%). The mean age of the interns was 24±1 years old, ranging from 24 to 31. Despite the interns' gender and marital status, their age was a significant contributor to their mean self-efficacy score (Pearson Chi-Square Sig.: 0.019, Eta Correlation: 0.325). The characteristics of the participants and their mean scores for the constructs of knowledge and self-efficacy by demographic status are shown in Table 3.

Content Validity Ratio (CVR) and Content Validity Index (CVI) of the items were acceptable at the ranges of 0.57 to 1 and 0.86 to 1, respectively. The impact score (IS) of the items was acceptable, between 3.66 and 5.

In all, 48.8 percent of the changes of interns' doctor-patient communication behavior were explained by eight constructs of SCT. Knowledge and self-efficacy were the two most important predictors of interns' successful doctor-patient relationship and together explained about 23 percent of the changes of interns' doctor-patient communication behavior. Descriptive statistics of the knowledge and self-efficacy

measures are shown in Table 4.

Both the measurement model of the construct of knowledge with 12 items and the measurement model of the construct of self-efficacy with 11 items showed a good fit to the data. Figure 1 shows the measurement modeling of the constructs of knowledge and self-efficacy. A good fit to the data was indicated by CFA. T-value between them was 7.73 and it was significant. Fit indices from confirmatory factor analysis were satisfactory as below: the root mean square error of approximation (RMSEA)=0.08, the relative Chi-Square statistic ( $\chi^2/df$ )=1.33, Normed Fit Index(NFI)=0.89, Non-Normed Fit Index(NNFI)=0.93, Comparative Fit Index(CFI)=0.93, Incremental Fit Index(IFI)=0.93 and Root Mean Square Residual(RMR)=0.036

Univariate linear regression analysis of the structural model between the interns' knowledge and self-efficacy explained how much the changes of interns' self-efficacy in building effective doctor-patient relationship were dependent on the changes of their knowledge about.

**Table 3:** Characteristics of the Study Sample (203 Interns) and Their Mean Scores for the Constructs of knowledge and Self-efficacy by Demographic Status

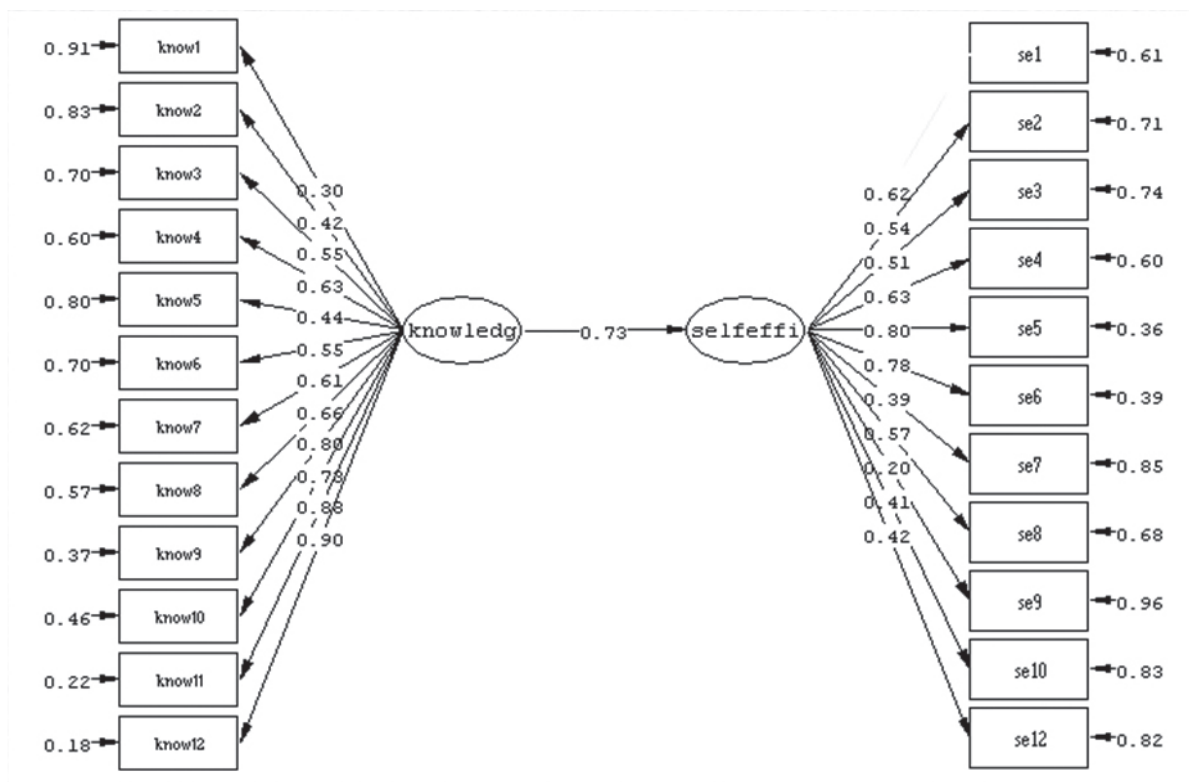
	Number(Percent)	Knowledge*	Self-efficacy*
Age			
23-26	152 (74.88)	35.33±6.51**	30.11±5.01
27-30	37 (18.23)	35.34±5.67	30.30±6.09
>30	14 (6.89)	36.20±4.98	31.05±5.01
Gender			
Male	89 (43.84)	34.89±6.76***	31.14±4.89
Female	114 (56.16)	35.78±5.46	29.48±5.05
Marital Status			
Single	126 (62.07)	34.74±5.89**	29.69±5.27
Married	73 (35.96)	36.47±6.17	31.09±5.62
Others	4 (1.97)	35.97±6.21	30.30±5.46

\*Mean (SD). Higher values indicate better self-efficacy; \*\*Results derived from one-way analysis of variance; \*\*\*Results derived from t-test

**Table 4:** Descriptive Statistics of the Knowledge and Self-efficacy Measures (n=203 interns)

Construct	Number of Items	Mean±SD	Cronbach's Alpha Coefficient	Composite Reliability	Correlation with the Overall score *	Total Variance Explained%
Knowledge	12	35.39±6.13	0.88	0.89	0.878	13.6
Self-efficacy	11	30.21±4.94	0.82	0.82	0.827	9.3

\*Correlation is significant at the 0.01 level (2-tailed)



**Figure 1:** Results of the Confirmatory Factor Analysis (knowledge and self-efficacy are latent variables and the items are observed variables)

Table 5 represents the model summary and parameter estimates of the model, in which interns’ self-efficacy is dependent on their knowledge.

**DISCUSSION**

According to the findings of this study, the interns’ self-efficacy in building a relationship with patients was significantly influenced by their knowledge about effective doctor-patient relationship. Furthermore, knowledge and self-efficacy were the two most important predictors of the interns’ successful communication behavior and totally explained 23 percent of variance in interns’ communication skill. This means that communication skills training

programs should focus on improving the physicians’ knowledge as well as their self-efficacy as to doctor-patient relationship. Opponents assert that physicians’ self-esteem or self-confidence are already high and they do not need to attend such training programs and health researchers should not give priority to self-efficacy in instructional designs. On the other hand, considering the facts that perceived self-efficacy refers to a person’s estimation of his or her ability to do a specific job successfully and self-esteem refers to the judgment of self-worth, proponents claim that self-efficacy and self-esteem are completely different from each other<sup>9,20</sup> and medical doctors’ high self-esteem does not mean that their self-efficacy as to building a relationship with patients is high,

**Table 5:** Model Summary and Parameter Estimates of the Model between Interns’ knowledge and Self-efficacy

Model	Unstandardized Coefficients		Standardized	t	Sig.	
	B	Std. Error	Coefficients Beta			
1	(Constant)	16.503	3.469		4.758	0.000
	Overallknowledge	0.623	0.076	0.731	8.190	0.000

a. Dependent Variable: overall Self-efficacy

as well. Moreover, self-efficacy is “behavior specific”<sup>21</sup> and physicians' self-efficacy, which is specific to their communication behavior needs to be improved.<sup>11</sup>

The interns' efficacy beliefs can regulate their learning and academic achievements.<sup>22</sup> Furthermore, self-efficacy has become a valid “predictor of students' motivation and learning” after many years of research.<sup>23</sup> For this reason, medical students' self-efficacy should be a crucial concern of educators in designing, planning and implementing educational programs in order to improve the physicians' confidence in building effective relationship with patients and increase their job satisfaction.

According to the findings of this study, the interns' self-efficacy was significantly influenced by their knowledge and 53 percent of the changes in interns' self-efficacy as to building an effective relationship with patients were explained by the changes in their knowledge about effective doctor-patient relationship. This means, learning facts and gaining insights about effective doctor-patient relationship can increase the interns' self-efficacy and consequently can improve their doctor-patient communication behavior.

Self-efficacy was reported as a significant predictor of the knowledge sharing behavior of 274 participants in a research based on social cognitive theory in Taiwan.<sup>24</sup> This finding is inconsistent with our study in which interns' self-efficacy was the second most important predictor of interns' doctor-patient communication behavior. Applying social cognitive theory in a research, we reported a statistically significant correlation between 25 nurses' knowledge and self-efficacy about pain management.<sup>25</sup> There was also no significant relationship between 273 diabetic adult patients' literacy and their self-efficacy in shared decision making.<sup>26</sup> Hence, further theory-based studies are recommended to investigate the relationship between the constructs of knowledge and self-efficacy.

#### *Limitations*

In the present study, the items for measuring

the interns' knowledge and self-efficacy as well as their communication behavior were derived from content analysis of the participants' interviews. Therefore, target group participation in designing of the research tool was the main strength of this study. However, the small sample size primarily limited this study. Including interns from other universities of medical sciences could expand the sample size. A narrow range of the interns' age in the universities in this study represented low diversity of participants. Including multiple universities could diversify the ages represented in our sample and benefit our results in terms of exploring the causal relationship between interns' demographic characteristics and their mean self-efficacy score.

#### **CONCLUSION**

In this study, both the magnitude and significance of the causal relationship between the interns' knowledge about effective doctor-patient relationship and their self-efficacy were noteworthy. Conducting further research by applying theories and models of behavior change is suggested in order to explore other important predictive determinants of medical students' communication behavior. Moreover, confirmation of the effectiveness of communication skills programs, which predominantly focus on physicians' knowledge and self-efficacy, will require much more time and combined evaluation methods. For example, patients with chronic diseases, who are regularly visited in university affiliated clinics, can be requested to provide feedback about the quality of physicians' communication skills many times, before and after these physicians attend such training programs. Indeed, it is believed that synthesizing the patients' feedback with physicians' self-evaluation can well clarify the effectiveness of communication skills training programs, which mainly concentrate on the physicians' knowledge and self-efficacy.

In all, according to the findings of this study, reflecting on “practice-based barriers” and examining the interns' insights about

physicians' routine behavior will improve their shared vision and consequently the quality of their knowledge about building an effective relationship with patients. Hence, planning for augmenting doctors' knowledge and self-efficacy in instructional design of any communication skills program can improve medical students' communication skills. However, as changes in interns' knowledge explained about 53 percent of the changes in their self-efficacy, the approaches to improving interns' self-efficacy as to building effective relationship with patients might be to target the strategies more than increasing their knowledge.

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**Conflict of Interest:** None declared.

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