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Master' Thesis of Public Health

An Exploratory Study on Effects of
Patient-Doctor Communication Factors
to Influence on Medical Outcome:
Applying RIAS

환자-의사 면담 조건이 의료 서비스 결과 상호 인식에
미치는 영향: RIAS 기법의 활용

August 2017

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May 2017

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Abstract

An Exploratory Study on Effects of Patient–Doctor Communication Factors to Influence on Medical Outcome: Applying RIAS

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Patient-centered care is emerging that takes the patient–doctor relationship into consideration and emphasizes patient preferences and opinions in decision-making. Physician–patient communication are important in that it is the beginning of the patient–physician relationship to understand the patient's expectations through dialogue, and they can make productive decisions through mutual agreement. In Korea, research on determinant factors such as patient's demographic factors and patient–doctor relationship factors were active however studies on the factors of communication are insufficient. Moreover, it is rare to analyze dialogue and counseling from the perspective of two-way communication. As the consequences, there has been little research on the inclusion of both the patient factor and physician factor considering satisfaction study. Very little is known about the effect of two-way communication and its determinants.

For that reasons, present study tried to find out whether there was difference between patient's and physician's perceived satisfaction and investigated the factors that affected to the satisfaction gap. In addition, study analyzed the real time medical communication and examined the

result illustrated the satisfaction gap. This study aims to investigate to measure satisfaction perception gap between patient and doctor and use RIAS method to analyze the doctor and patient consultation to figure out reality of medical communication in Korea.

103 outpatients who were older than 18 years old accepted to participate in the study. Two private Orthopedics hospitals permitted to study and 5 doctors agreed to participate in this study. Recording their medical consultation and post-treatment survey was conducted at two private hospitals in Seoul. Patient questionnaires measured the patient's general information, trust toward doctor, patient's self-efficacy in communication, beliefs and patient's self-reported satisfaction. Doctor's questionnaire was asked about physician's age, gender and doctor's perceived patient satisfaction. Recording was analyzed through RIAS to extract communication factors.

Wilcoxon signed ranks test was used to determine the difference between patient self-reported patient satisfaction and doctor's predicted patient satisfaction. Spearman's correlation was used to confirm the correlation between variables. Ordinal logistic regression analysis was performed to investigate the factors affecting the satisfaction gap and RIAS was used for examining present situation of medical communication in orthopedics.

Result showed significant difference in patient satisfaction and doctor satisfaction. As expected, both patient's and doctor's factors explained the gap: Patient's age, patient's self-efficacy in communication, patient's trust, doctor's positive talk, and doctor's open-ended questions. Notably the number of visits were positive relationship with satisfaction gap.

In addition to identifying presence of satisfaction differences, this study analyzed whether patient-doctor communication patterns differed by gap size. Consequently, high satisfaction gap group had higher percentage in doctor's closed-ended questions, doctor's information giving, doctor's facilitative talk, and patient's information giving. Group which had low satisfaction gap had higher percentage in doctor's open-ended questions, doctor's directive talk, doctor's emotional talk, doctor and patient's positive talk, patient's questions and patient's facilitative talk. Patient's emotional talk had similar percentage in two groups.

Based on the results, present study emphasized suggestions. (1) In order to improve patient satisfaction in the future, it is desirable to set the patient–doctor relationship as the unit of analysis relationship and make efforts to include it into major variables; (2) More attempts are needed to find out and measure the communication variables of the healthcare provider, including the variables identified in this study; (3) Theoretical basis is needed to explain this outcome; (4) It is necessary to identify the characteristics of the patients especially those who recognize the gap significantly and find the improvement for narrowing gap.

Even though present study has various limitations, it is a new attempt to analyze determinants of satisfaction gap. Also, it is necessary to use variety of international research approaches including RIAS. This study expects to trigger for patient centered medical care related researches.

Keywords: patient–doctor communication, satisfaction gap, patient–centered care, communication style, RIAS, patient–doctor interaction, two–way communication

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* This Research has been conducted by the research grant of Research Institute for Healthcare Policy, KMA in 2017

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1. Introduction

1.1 Background

Patient-centered care, which change the patients' role as the active participants, has emerged as the two-way diagnosis due to development of science and the improvement of medical information accessibility. It emphasizes patient's preference and values when assessing medical services and deciding medical treatment (Epstein et al., 2007)

Patient-doctor communication is based on the information exchange process to diagnosis and examining patient symptom during limited medical interview time (Street, 1991; Frederikson, 1993; Ong, de Haes et al., 1995). Medical encounter is the beginning of the relationship between the patient and the doctor (Charles, Gafni & Whelan, 1997) and it is a process to understand patient's expectation for making productive decision through mutual agreement (Williams et al., 1995; Stewart et al., 1999). Also, it has influence on patients' health, such as the patients' medication and the implementation of the treatment directly or indirectly (Street et al., 2009; Ha & Longnecker, 2010). For that reasons, medical communication is one of the most important factors to manage the quality of care (Roter & Hall, 2006).

However, patient and doctor communication is not always perfectly matched each other. Because of individuals' disparate characteristics, educational level, and capability, many decisions cannot be deliberated to make optimal choices. Even if the same words are conveyed and be heard, differences can be arose according to listener's interpretation or perception. Those differences makes inaccurate medical information that can cause unpredictable medical errors or malpractices (Frank, Lawless & Steinberg, 2005).

In particular, system and policy principles apply different depending

on certain context and environment. For example, the interview time is short enough to be called the 3-minute treatment in Korea, it is preferable to perform effective and efficient treatment through accurate diagnosis within the interview time. It is extremely short time in patient and doctor dialogue compared to the United States. Several explanations can explain the reason why it has short medical dialogue but institutional and hospital management environment is the main explanatory factor that forces hospitals and doctors to conduct patient satisfaction survey regularly(Insurance Future Forum, 2012). However, these system reveals limitations to consider only patient's perspectives and repeating fragmentary questions.

1.2 Needs of Study

Patient dissatisfaction comes from communication problems (Richard, 1990). Even if there is evidence that communication take a large part of patient satisfaction, limited study conducted to find out the reason why there were communication problem. The study according to the environmental factors and the socio-demographic factors of the patient are active but the study about communication factors are insufficient. Even though study was measured communication factors that affected patient satisfaction, most of the previous study used survey questions that could not catch the complex meaning between the lines. Moreover researches on patient-doctor communication in Korea has been limited (Park, 1999; Kim, 1999; Kim 2000; Seo, 2001). In addition, there is a little studies that have studied patient-doctor communication itself in Korea (Im, Lee & Paik, 2009).

Patient satisfaction is the representative measurement outcome of patient-doctor communication. It is certain that both doctor's side and patient's side should be considered when measuring patient satisfaction under the condition that communication is the interaction between patient and doctor. However, most of study regarding patient satisfaction focus on patient's perspectives compared that study researching doctor's perception and prediction toward patient satisfaction is rare. Moreover, there is a limit to objectivity in measuring patient satisfaction by self-reported method (DiMatteo et al., 1993).

It is reported that 8% of patient felt uncomfortable when they were talking to doctor and about 52% of outpatient did not talk with doctor why the surgery needed and how it processed when they decided to have examination (Kang et al., 2016). This is an example showing that there is still lack of interactive communication in the medical circumstances in Korea. It is because many existing patient satisfaction study only emphasize patient's perspectives.

For that reason, present study emphasize the need to research about measuring both patient and doctor's expected patient satisfaction and compare whether there is a gap between them. Also, study will find out the determinants to affect satisfaction gap on condition that patient satisfaction factors have influence patient satisfaction gap. Patient and doctor communication is measured by Roters Interaction Analysis System(RIAS) to find out medical communication reality in Korea and shed light on the reason why there is a communication gap between two parties.

By comparing the difference of experiences, expectations, and perception level between the doctor and patient, the present study complements the limitations of existing patient satisfaction study. Also, the study using quantitative analysis of patient and doctor communication differentiated from the previous research that was only conducted through short-form of survey or interview.

1.3 Study Objective

The purpose of this study is to understand the factors affecting the patient satisfaction, considered as the important indicator to quality of care, from the perspective of bilateral communication. Unlike previous studies, this study measures the size and the gap of patient – doctor satisfaction rather than patient satisfaction itself. Also, we analyze not only demographic variables but also characteristics of communication and relationship. Specific research questions are as follows:

- 1) Examining whether there is the difference between patients' self-reported satisfaction and doctors' perceived patients' satisfaction in outpatient setting
- 2) Identifying whether the factors presented in the previous study(patient demographic factors, patient–doctor relationship factors, patient attitude and belief factors, medical environmental factors and communication factors) have an effect on satisfaction gap between patient and doctor
- 3) Identifying whether there is the communication differences between high satisfaction gap group and low satisfaction gap group.

2. Literature review

2.1. Patient satisfaction gap research

The first thing physicians should do when interviewing doctor–patient is to find out what the patient expects and increases patient participation in decision–making. So medical institution measures the perception of medical outcomes to assess whether their expectations are met and investigate to make efficient communication (Hafferty, amp& Light, 1995). A medical outcome indicator means that the patient's present or future health changes in a more positive direction than previous health (Donabedian, 1981). Typically, patient satisfaction has been assessed by medical outcome indicators in medical conversation (Burgoon, Birk & Hall, 1991; Zandbelt, 2004; Johnson & Russell, 2015; Panchapakesan, Sai & Rajendran, 2015). Patient satisfaction is used to evaluate the quality of medical services for a specific institution or healthcare provider and it changed to emphasize the patient–doctor interaction about expectation and recognition as the importance of patient–doctor relationship grew (Wolf, Putnam, James, amp& Stiles, 1978).

Meanwhile, physician satisfaction did not have attention in contrast to patient satisfaction. Several studies stated that there need to be researched and simultaneously measure both doctor and patient satisfaction (Koehler, Fottler & Swan, 1992; Hall, Stein, Roter & Rieser; 1999; Merkel, 1984; Shannon, Mitchell & Cain, 2002; Zachariae et al., 2003).

There were two stream to measure patient and doctor satisfaction. One is to measure both patient satisfaction and doctor's satisfaction. The other was measured patient satisfaction and doctor's predicted or perceived satisfaction toward the patients. Generally preceding researches verified the differences between each two parties and checked whether there was any relationships between them. Table 1 is shown previous study list and summary of important study results. Unfortunately, studies have conducted

to find out factors affecting to patient satisfaction gap between patient and doctor were limited.

Table 1. Previous study list of satisfaction gap

Author(year)	Variable	Differences	Correlation
Kim &Kim (1999)	patient satisfaction and doctor's satisfaction	doctor>patient	–
Shannon, Mitchell& Cain (2002)	patient satisfaction and medical provider predicted satisfaction	Nurse ≈ patient, doctor>patient	–
Vedsted, Mainz, Lauritzen & Olesen (2002)	Patient satisfaction and doctor's satisfaction on medical treatment	somewhat patient>doctor, somewhat doctor>patient	Highly correlated
Zanbelt et al (2004)	Patient satisfaction and doctor's satisfaction	Patient>doctor	–
McKinstry, Colhart, &Walker (2006)	Patient satisfaction and doctor's predicted patient satisfaction	–	weak correlation
Cannon (2007)	Patient satisfaction and doctor's predicted patient satisfaction	patient>doctor	poor correlation
Kisa et al (2011)	Patient satisfaction and doctor's satisfaction	Patient>doctor	medium size
Kang (2013)	Patient's family satisfaction and	Patient's family> doctor	–

	doctor's predicted satisfaction		
Hirukawa et al. (2015)	Patient satisfaction and doctor's satisfaction on medical treatment	–	no correlation
Sebo, Herrmann &Haller (2015)	Patient satisfaction and doctor's predicted patient satisfaction	Patient>doctor	–
Zhang, Day,& Iorio (2017)	patient satisfaction and doctor's satisfaction	no except satisfaction on explanation	–

2.2. Factors affected to patient satisfaction

Patient's demographic characteristic is one of the most common factors to predict the patient satisfaction. Older patients are commonly more satisfied with medical care than younger patients (Pascoe, 1983; Bakers, 1996; Jaipaul & Rosenthal, 2003) and women reported higher satisfaction level than men (Pascoe, 1983; Shortell, Richardson, LoGerfo, Diehr & weaver, 1977). Socioeconomic status is positively associated with patient satisfaction whereas education level is negatively associated with patient satisfaction (Hall & Dornam, 1990; Pippel, 1996). Income was significant relationship with patient satisfaction. People who had a higher income were likely to have higher satisfaction (Becker & Newsom, 2003; Xio & Barber, 2008). Hall et. al research (1990) found out that patient's individual health status were associated with patient satisfaction. Patient's perceived health positively correlated with satisfaction. In other words, the healthier patient perceived their health, the higher patient report patient satisfaction (Cleary et al., 1989; Cleary et al., 1992; Cohen, 1996; Atkinson & Haran, 2005).

The patient and doctor relationship factor was also found to have an effect on the patient satisfaction. In particular, the higher the patient's trust in the doctor, the higher the patient's satisfaction (Barbaar et al., 2016). Patients with expectation of high quality of care and communication tend to report to have high satisfaction level (Abramovitz et al., 1987; Rao, weinberger & Kroenke, 2000; Al-Windi, 2005). Patient's attitude and belief factor affects to the patient satisfaction. Expectation toward doctor had influence on patient satisfaction that was positively associated with patient satisfaction (Zandbelt et al., 2004). However, it could not explain that higher expectation meant higher satisfaction because the degree to meet expectation or not was crucial to factors to Satisfaction. Frosthalm et al study (2005) supported that illness perception is one of the predict of patient satisfaction.

Also medical environmental factor such as presence of accompany, length of consulting time and number of visits have positive influence on patient satisfaction (Kenny, 1995; Crow et al., 2002; Rahmqvist & Bara, 2010; Kardas, Lewek & Matyjaszczyk, 2013;). Meanwhile, communication factor was vital to predict patient satisfaction level. Doctors factor such as asking questions (H. Isikawa et al., 2002), social talk (Freeman et al., 1971; Stewart, 1989;), positive talk (Creene et al., 1994; Roters et al., 1987; Roters et al., 1988) and giving information (Kenny, 1995; Kent-smith et al., 1981) were positive relationship with patient satisfaction. Patient's giving information had positive association with patient satisfaction (Kenny, 1995; Kent-smith et al., 1981). On the other hand, number of doctor's questions were negative association with patient satisfaction (Freeman et al., 1971).

Table 2. Determinants of patient satisfaction

Factor	Patient satisfaction
Patient demographic factor	(+) women, older people, high level of education, higher socioeconomic status
Patient–doctor relationship factor	(+) trust, expectation
Patient attitude and belief factor	(+) self–efficacy, (+) belief
Medical environmental factor	(+) accompany, number of visit, length of consulting time
Patient–doctor communication factor	(+) doctor's asking questions, patient gives information, doctor's social talk, doctor's positive talk, doctor's giving information (–) doctor's questioning

2.3 Roters Interaction Analysis System(RIAS)

The Roters Interaction Analysis System (RIAS) is one of the interactive analytical methods based on the social exchange theory that medical counseling can influence the decision role changing to emphasize the duty of the patient and doctor for therapeutic purpose. It is a method to cut the doctor–patient interview into a unit of utterance and categorize it into 41 categories only listening to a recorded audio tape not transcribing doctor–patient interview. The 41 categories are largely divided into doctor dialogues and patient dialogues. Within each doctor and dialogue category contains data collection(biomedical question, psychosocial question), education and counseling(biomedical topic, psychosocial topic), relationship formation(social talk, positive talk, negative talk, emotional talk and procedural talk).

It has the advantage of analyzing the content and context of the conversation that occurs in from daily life to the medical encounter. It complements the existing methods of interaction analysis in that it can analyze the process according to the flow of information(Dijkstra et al., 2013). RIAS is the analytical method to interpret the real–time medical communication by analyzing through third party that can obtain objective viewpoint(Roter & Larson, 2002). RIAS is a proven methodology that has advantages in high degree of reliability and validity, as it has been created by revising and complementing previous interaction analysis frameworks(Roter & Larson, 2002).

The results of previous study proved that RIAS is efficient to measure outcome of medical quality such as patient's emotional stress (Roter et al., 1995), physician satisfaction (Beach et al., 2013), patient satisfaction(Bertakis, Roter & Roter et al., 2012) and patient compliance (Cruz et al., 2013). In a previous study in Korea, the interaction between

nurses and patients was analyzed using patient satisfaction as the outcome variable among nurses(Kim, 2005), and relationship between nurse and patient(Kim, 2010). Shin et al.,(2015) reported the importance of patient-centeredness by analyzing physician-patient interactions according to physician gender. In this regard, the number of articles using RIAS in Korea is very scarce and most studies have figured out communication style difference according to demographic factors.

3. Method

3.1. Research Hypothesis

Study Hypothesis were detailed in below:

Research questions 1. Is there any differences between patient' s self-reported satisfaction and doctor' s perceived patients' satisfaction?

Research questions 2. The factors presented in the previous study(patient demographic factors, patient-doctor relationship factors, patient attitude and belief factors, medical environmental factors and communication factors) have an effect on satisfaction gap between patient and doctor?

Assumption 2-1 patient' s self-reported satisfaction has relationship with satisfaction gap between patient and doctor

Assumption 2-2 Doctor perceived patient satisfaction has relationship with satisfaction gap between patient and doctor

Assumption 2-3 patient' s self-reported satisfaction has relationship with doctor perceived patient satisfaction.

Research question 3. Is there any communication differences between high satisfaction gap group and low satisfaction gap group?

3.2. Data Collection

Data analysis was based on a primary data with survey and record file from doctors. The patients and physicians who agreed to participate in the study were interviewed, and the questionnaires were given to the patients and doctors, respectively. Doctors filled out questionnaires about the patients' satisfaction who agreed to participate in the study. Patient's survey consisted of patient's demographic questions, medical environmental questions, patient and doctor relationship questions, patient attitude and belief questions, and patient satisfaction. On the other hands, doctor's survey contained doctor's demographic questions and patient satisfaction questions.

This study was conducted at the Neo orthopedics hospital and Kim Sung-Su Micro private hospital in Seoul, South Korea. Five doctors and one hundred and three patients participated in this study. Patients and doctors were eligible for this study who were over 19 year old and has South Korea citizenship. The criterion for exclusion of the study participants is under 19 years old or not a Korean.

Data collection started on May 21-24, 2017. Both of the recruiting hospitals are orthopedic hospitals because most of the patients had to conversation more than other department that most of patient had chronic disease that had to be treated for a long time. Park Jin Young Neo orthopedic and Kim Sung-Su hospital were chosen because it is located in the same building that accessibility of the patients is the same. Moreover study was limited to two hospitals for data accessibility and control of disturbance variables. This study had approval of the Seoul National University Institution' s Joint Committee on Investigation IRB No. 1706/001-003

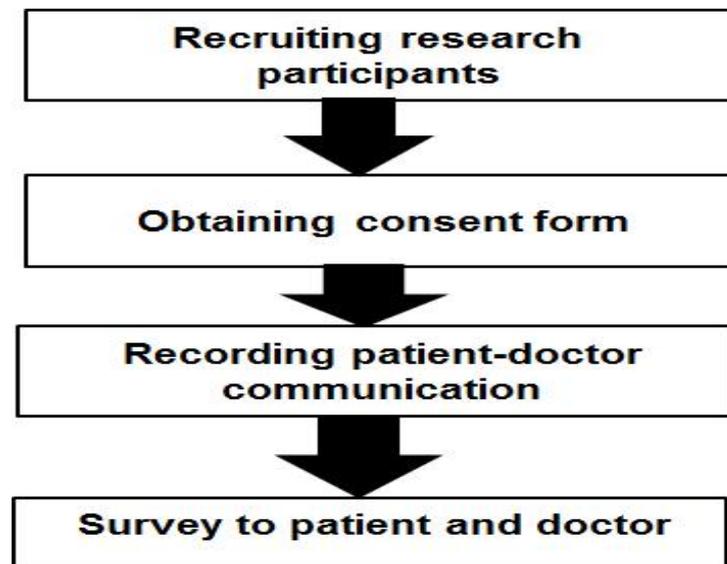


Figure 1 . Data collection process

Before started to collect data, researcher asked hospital to participate in the researches. One month before study started, researcher placed recruiting posters at the hospital desks that have been approved for research. Participants talked to hospital receptionists to whether they wanted to participate or not. Researcher checked participation list and matched with treatment reservation from the hospital receptionists. For obtaining study participate agreement, researcher provided paper agreement which explained about purpose of study, background of research, information protection of the survey results, and scope of information utilization. If patients had difficulty in reading the agreement paper, researcher read the agreement in oral. Pilot study was conducted on April 20~ 24 for preparing record schedule and designing with the flow of patient and medical provider's traffic line not to disturb medical treatment. The process of actual research was recording the patients and doctor consultation who consented to participate in the study and asked to survey patients and doctors respectively after finished consultation. Figure 1 displayed research process in diagram form.

Number of target participants were measured by G-power 3.1.9 analysis and the sample size was calculated as 90 for the significance level of .05, the power of 0.95, and the effect size of 0.15. Present study

collected 103 patients and 5 doctors.

3.3. Main Variables

1) Independent Variable

–Individual characteristic

Patient's socio-demographic factors are asked for individual characteristics. Age was measured by using open-ended questions for patient to self-report it. Gender was measured with two Likert scale ranging from 0:men to 1: women. Education level was measured with five Likert scale. 1:middle school graduated , 2: high school graduated, 3: college or university graduated, 4: have master degree or more , 5: others. Occupation was using self-reported question. Income was measured using twelve answers about participant's average income. Perceived health condition was measured using five Likert scale 1 :very bad to 5: very good.

–patient–doctor relationship factor

①Patient trust

Patient trust to their doctor was measured by five validated questions with five-point Likerts scale using 1 to 5 from strongly disagree to strongly agree(Safran et al.,1998; Piette et al., 2005). Questions are detailed in below:

“I can tell my doctor anything” ; “I completely trust my doctor's judgment about my medical care” ; “My doctor cares more about doing what is needed for my health than holding costs down” ; “My doctor would always tell me the truth about my health, even if there was bad news” ; and “If a mistake were made in my treatment, my doctor would try to hide it from me.”

The scale score were calculated as the average of each items. Higher scores indicated higher patient trust toward doctor.

②patient expectation

Patient expectation was measured by fourteen questions which was combined ten validatable questions from Ruiz–Moral and his colleague (2007) and four questions from Swenson et al study(2004). Questions utilized five–point Likerts scale ranging from 1: very strongly disagree to 5:very strongly agree. Questions are detailed in below:

I have expectation on:

“Showing the interest and listen to me” ; “Being interested in the patient as a person” ; “devoting enough time to me” ; “giving support and reassurance” ; “doctor’ s open–minded” ; “taking the patient’ s problems seriously” ; “communicating in simple, clear language” ; “giving me some advice about what I should do by suggesting a good plan” ; “giving physical examination” ; “Referring me to a specialist doctor” ; “ordering some test” ; “Giving a chance to say what was on patient’ s mind” ;” knowing about the risks and benefits of alternative medication”

The scale score were computed as the average of each items. Higher scores indicated higher patient expectation toward doctor.

–patient attitude and belief factor

①patient self–efficacy about communication

Patient self–efficacy about communication was measured using the following items from Perceived Efficacy in Patient–doctor Interactions (PEPPI) 10 validated question(Maly et al., 1998). Participants responded five–point Likert scale ranging from 1: very strongly disagree to 5:very strongly agree. Questions are detailed in below:

"How confident are you in your ability to get a doctor to pay attention to what you have to say?" ; "How confident are you in your ability to know what questions to ask a doctor?" ; "How confident are you in your ability to get a doctor to answer all of your questions?" ; "How confident are you in your ability to ask a doctor questions about your chief health concern?" ; "How confident are you in your ability to make the most of your visit with a doctor?" ; "How confident are you in your ability to get a doctor to take your chief health concern seriously?" ; "How confident are you in

your ability to understand what a doctor tells you?" ; "How confident are you in your ability to get a doctor to do something about your chief health concern?" ; "How confident are you in your ability to explain your chief health concern to a doctor?"; "How confident are you in your ability to ask a doctor for more information if you don't understand what he or she said?"

The scale score were computed as the average of each items. Higher scores indicated higher patient self-efficacy in communication.

②patient belief(illness perception)

Patient belief was measured using following items from IPQ-R(ILLNESS PERCEPTION QUESTIONNAIRE-revised in personal control(Moss-Morris et al., 2002). Participates responded six validated questions with visual analogue scale ranging from 1:very strongly disagree to 5: very strongly agree. After reversing some question score, scale score were computed as the average of each items. Questions are detailed in below:

"There is a lot which I can do to control my symptoms"; "What I do can determine whether my illness gets better or worse" ; "The course of my illness depends on me" ; "Nothing I do will affect my illness" ; "I have the power to influence my illness" ; "My actions will have no affect on the outcome of my illness"

The scale score were computed as the average of each items. Higher scores indicated higher patient belief toward illness perception.

-Medical environmental factor

①Presence of accompany

Presence of accompany was measured two Likert scale ranging from 1: no to 2: yes. Questions were asked whether patient came hospital alone or not. For logistic regression, variable changed as dummy variable as 0:no and 1:yes.

②Number of visit

Number of visit was measured using open-ended self-reported question. The questions asked how many times patient visits the same hospital. First time visitors asked to report the number of visit as 0.

③Length of consultation

Length of consultation was divided by five intervals from 1 to 5. Each intervals was divided by minutes.

-patient-doctor communication factor

patient-doctor communication factor was measured using by RIAS program. All patient and doctor dialogue was coded into RIAS basic categories that could apply each speakers by coder. Example of RIAS categories are shown in table 3.

Table 3. Variables, contents, and example about RIAS basic categories (Roter, 1991)

RIAS basic variables	Contents	Examples
Medical questions	All questions–medical+ all questions –therapeutics+ all questions – others+ bid for repetition	<p>What kinds of side-effects will this treatment have?</p> <p>Are you taking any medications?</p> <p>Why do I get these pain?</p> <p>What did the other doctor say?</p> <p>Say that again?</p> <p>Huh?</p>
Psychosocial and lifestyle questions	All questions–lifestyle+ all questions–psychosocial	<p>Do you drink alcohol?</p> <p>Do you have a prescription plan?</p> <p>How you feeling?</p> <p>What bothers most?</p>
Medical information giving	Gives information–medical+ gives information–therapeutic+ gives information–others	<p>I did a x-ray about month ago.</p> <p>Your blood pressure is 110 over 80.</p> <p>I take the blood pressure pills 3 times a week.</p> <p>I'm going to make an appointment for you in 2 months</p>
Psychosocial and lifestyle information giving	Gives information–lifestyle+ gives information–psychosocial	<p>I've been working mostly in the office.</p> <p>I drink 3 cups of coffee a day.</p> <p>I got nervous if I did not work out everyday.</p> <p>My family is really supportive.</p>

Facilitative talk	Ask for service+ asks for reassurance+ asks for understanding+ paraphrase/ checks for understanding	It did? So you had surgery 2 years ago. Can you recommend hospital? Can we check my blood pressure as well? Do you think it really helps? Can you reassure me that you will follow instruction?
Positive talk	Laugh+ approval+ compliment+ shows agreement	okay. Dr. Sung was so kind and awesome. The nurse was so thoughtful in consultation
Negative talk	Disagreement+ criticism	I don't think so. I cannot believe it. I can't think he could did it. She will never help until I ask her for help.
emotional talk	Empathy statement+ Legitimation statements+ concern+ Reassures	This looks better than before. I feel really good. I'm so afraid that it will hurt me. This might be hurt you. Everybody afraid of having shots. It is natural to get nervous before you got examination.
Social Talk	Personal remarks	Hello, nice to meet you. How is it going?
Procedural talk	Transitions+ gives orientations	Please sit down and raise your hand in here.

		Now step down off the scale. Let's talk about All right then let's.....
--	--	--

In this study, patient and doctor communication factors distinguished by previous research with eleven clusters (Ishikawa et al., 2002). Each eleven clusters were extracted from 41 RIAS basic coder and add each corresponding categories. Eleven clusters were open-ended questions, closed-ended questions, information giving, direction, emotional expression (patient category), emotional responsiveness (doctor category), facilitation, positive talk, negative talk, orientation, requests for service, and social talk. Open-ended questions contains any open-ended questions about medical, therapeutic, lifestyle and psychosocial subjects. Open-ended questions are applicable for doctor only based on the RIAS basic category.

Closed-ended questions are questions about all four topic as mentioned before. Information giving contains information giving about medical, therapeutic and lifestyle regimen. Direction is all about the counseling and direction toward doctor or patient. Concern and reassurance are both in emotional expression for patient category and emotional responsiveness for doctor category. The differences between two are emotional expression for patient category consist of asks for reassurance and give information about the psychosocial status.

On the other hand, emotional responsiveness for doctor category contains self-disclosure and empathy toward patient during consultation. Facilitation comprises of ask for understanding or repetition. Asks for opinion is only applicable for doctor facilitation cluster. Positive talk is about any agreement, approval or laugh, whereas negative talk is statement about any disapproval or criticism. Orientation is only apply for doctor which gives any orientation to patient. Request for service is apply for patient that request for service to doctor. Lastly, social talk is about the personal remarks or social conversation during consultation. All of the eleven clusters were divided by each total dialogue utterances. So communication factor was expressed by talking percentage in each dialogue. Since T-value was so small that it could not be shown the

significant differences, study changed the unit by multiplying 10 to analysis. Following Table 4 illustrate the cluster of communication based on RIAS basic category.

Table 4. cluster of communication based on RIAS basic category (Ishikawa et al., 2002)

Subject of cluster	Cluster of communication	Original RIAS basic category
Both	Closed-ended questions	Closed-ended questions regarding medical, therapeutic, lifestyle and psychosocial regimen
	Information giving	Information giving about medical, therapeutic and lifestyle
	Direction	Direction and counseling about medical, therapeutic, lifestyle and psycho-social regimen
	Positive talk	Agreement, approval and laugh
	Negative talk	Disapproval and criticism
	Social talk	Personal remarks and social conversation
Patient	Emotional talk	Concerns, reassurance, ask for reassurance, give information about psychosocial status
	Request for service	Request for service
	Facilitative talk	Ask for understanding and repetition
Doctor	Open-ended questions	Open-ended questions about medical, therapeutic, lifestyle and psycho-social regimen
	Emotional talk	Concern, reassurance, self-disclosure, empathy
	Facilitative talk	Ask for understanding and repetition, ask for opinion

2) Dependent Variable

Dependent variable is the differences between patient's

self-reported satisfaction and doctor's perceived satisfaction. Satisfaction question are asked both doctor and patient with same questions based on validated the patient satisfaction questionnaire(PSQ). PSQ is more detailed in below:

-Patient self-reported satisfaction (PSQ patient)

Looking back at the conversation you just had with this doctor:

"How well did the doctor address your needs?" ; "How actively were you involved in talking and participating in the interaction?" ; "How satisfied are you with the adequacy of the information you received from this doctor?" ; "How satisfied are you with the emotional support you received from the doctor?" ; "Overall, how satisfied are you with the interaction?"

-Doctor perceived patient satisfaction(PSQ doctor)

Looking back at the conversation you just had with this patient and predict the answer in perspective of the patient:

"How well did the doctor address your needs?"; "How actively were you involved in talking and participating in the interaction?" ; " How satisfied are you with the adequacy of the information you received from this doctor?" ; " How satisfied are you with the emotional support you received from the doctor?" ; "Overall, how satisfied are you with the interaction?"

Answers were given on Visual Analogue Scale(VAS) which consist of 0(not at all) to 100(extremely well). An overall satisfaction score was obtained by averaging five questions of each doctor and patient PSQ. Dependent variable was calculated by subtracting PSQ patient to PSQ doctor and converting its result to absolute value. For statistical analysis, rank transformation was used and dependent variable were separated by three group according to the rank(kim & kim, 1999). High rank was coded to 3, middle rank was coded to 2, and the other was coded to 1 .

3)Control Variable

Doctor's demographic factors such as gender and age were asked in the survey questions. Doctor self-reported their gender and age. Doctor's gender was coded 0:male and 1: female for logistic regression. Table 5 showed summary of variables in this study.

Table 5. Summary of variables

Variable	Category	Contents	Type	Reference
Independent variable	patient's demographic factor	gender	Select	Galuska et al., 1999
		age	type	
		income	select	
		perceived health	5 likert scale	
	patient-doctor relationship factor	trust	5 likert scale	Safran et al.,1998; Piette et al., 2005
		expectation	5 likert scale	Ruiz-Moral et al., 2007, Swenson et al., 2004
	patient attitude and belief factor	self-efficacy about communication	5 likert scale	Maly et al., 1998
		belief	5 likert scale	Moss-Morris et al., 2002
	medical environmental factor	presence of accompany	select	
		number of visit	type	
		length of consultation	type	
	communication factor	Doctor's open-ended questions	RIAS coding	Ishikawa et al., 2002
		Doctor's closed-ended question		
Doctor's information giving				

		Doctor's directive talk		
		Doctor's emotional talk		
		Doctor's facilitative talk		
		Doctor's positive talk		
		Patient's questions		
		Patient's information giving		
		Patient's emotional talk		
		Patient's facilitative talk		
		Patient's positive talk		
Dependent variable	patient satisfaction	Satisfaction gap between patient and	100 visual analogue scale	Zandbelt et al., 2004

3.4 Study Design

Figure 2 illustrates the study design according to study objectives.

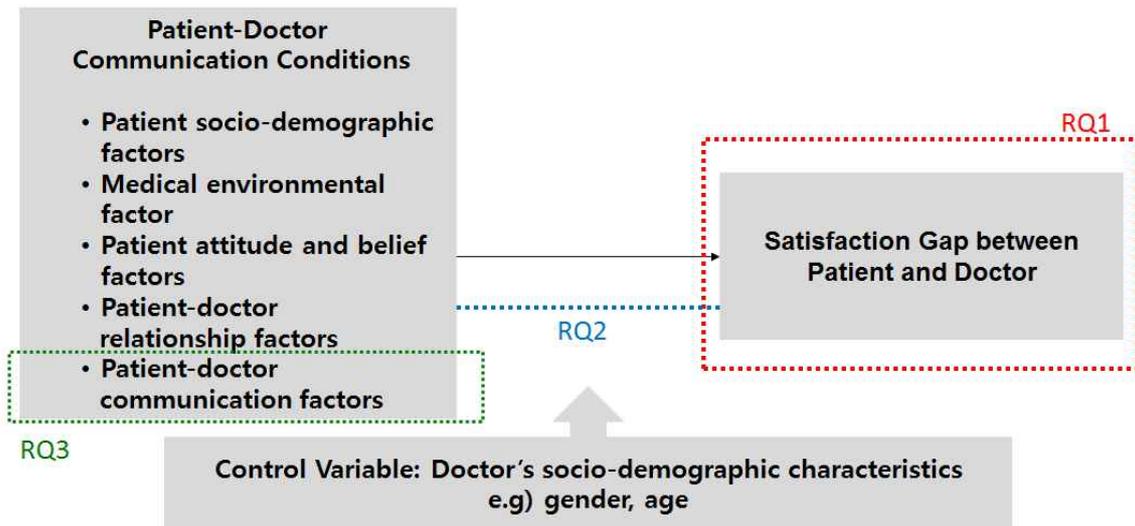


Figure 2. Study Design

1) Statistical Analysis

Statistical analysis was used by R 3.2.3 program and SPSS statistics 22 in this study. Frequency distributions and descriptive statistics such as mean and standard deviation were used for patients' demographic information. Dummy variables were made in order to reconstruct accompany and gender variable for analysis. Cronbach alpha value and Shapiro–Wilk normality test were checked to confirm the reliability and normality of the survey tool. Wilcoxon signed Ranks test was used for examining whether there is a difference between patients' self-reported satisfaction and doctors' perceived patients' satisfaction. In order to investigate condition of medical communication in specific setting, RIAS were used for interpreting communication reality in Korea. Also, spearman's correlation was used to find out the association between the variables. Since the dependent variable was measured by ordinal scale and it did not follow the normal distribution, ordinal logistic regression was

conducted to find out the significant relationship about the research questions.

3.5 Variable Reliability and Normality

Variable reliability (table 6) was measured by Cronbach's alpha to check internal consistency within the questions. Internal reliability of five trust questions was 0.775. Cronbach's alpha for expectation was 0.928 and 0.876 for self-efficacy. Cronbach's alpha in belief was 0.693 that all of the questions in this study could consider to have high reliability within questions.

Table 6. Reliability of each variable question

Variable	Cronbach's alpha
Trust	0.775
Expectation	0.928
Self-efficacy	0.876
Belief	0.693

Intra-coder reliability was conducted in random sample of 5% of recording (n=5). Intra-coder reliability was 0.8 that extracted data from RIAS had high reliability. The RIAS-trained Korean speaking coder was not available so inter-coder reliability could not be established in this study.

Shapiro-Wilk normality test was conducted to check normality of dependent variable and it resulted that dependent variable did not follow the normal distribution ($p < 0.05$) as following Table 7.

Table 7. Shapiro-Wilk normality test

Variable	p-value
Satisfaction gap	0.03

4. Study Result

4.1 Participant's General Characteristics

The average age of patients was 36.36 (SD=17.82). Fifty were male patients who were occupied 48.5% of participants. Fifty-three patients(51.3%) were female. 12.6% of patients were middle school graduated, 40.8% of patients were high school graduated for their final academic background. 32% of patients had bachelor degree and 9.7% of patients had master or doctor's degree. 5.8% of patients responded to others. Most of patients respond that their subjective health as normal. All of the doctors were male and surgeons. The fraction of doctor to patient was 5/103. Characteristic of patients and doctors are shown in Table 8.

Table 8. The characteristic of patients and doctors

Variable		N	%
<i>Patient Characteristic</i>			
Gender	Male	50	48.5
	Female	53	51.5
Age(year)		Mean 36.36±17.82	
Educational attainment	Middle school graduated	13	12.6
	High school graduated	42	40.8
	college or university graduated	33	32
	Graduated school graduated	9	9.7
	Others	6	5.8
	Perceived patient's health	Very good	6
	Good	22	21.4
	Neutral	40	38.8
	Bad	33	32
	Very bad	2	1.9
Average monthly household income(10,000 won)	no income	31	30.1
	less than 100	6	5.8
	100~200	9	8.7
	2,00~<300	11	10.7
	300~<400	9	8.7
	400~<500	10	9.7
	500~<6000	9	8.7
	600~<700	2	1.9
	700~<800	6	5.8

	800~<900	2	1.9
	900~<1000	4	3.9
	more than 1000	4	3.9
<i>Doctor Characteristic</i>			
Gender	Male	5	100
	Female	0	0
Department	Surgical	5	100
	Internal	0	0

The characteristic of variables are shown in table 9. Half of patients came with friends, family or others when they got treatment. The average length of time was 223 seconds, which is approximately 4 minutes. Patients participating in the study visited the research recruitment hospital on average 4.45 times. Both patient–doctor relationship factor and patient attitude and belief factor were above the average. Most of all mean of patient's trust to doctor was highest among the variables and expectation was the second.

Table 9. Characteristic of variables

Variable		Mean(SD)
Medical Environmental factor	Presence of accompany	0.51 (0.50)
	Length of consulting time	223.27 (149.02)
	Number of visits	4.45 (5.897)
Patient–doctor relationship factor	Trust	4.07 (0.57)
	Self–efficacy in communication	3.99 (0.46)
Patient attitude and belief factor	Expectation	4.03 (0.66)
	Belief	3.83 (0.49)

The cluster between patient and doctor during consultation was extracted through the Roters Analysis System(RIAS). The data from the RIAS showed how doctor and patient talked and which communication clusters were frequently used during medical encounter. Figure 3 is shown

about the utterance frequency in doctor's talk and patient's talk .

Utterance frequency in doctor's talk and patient's talk

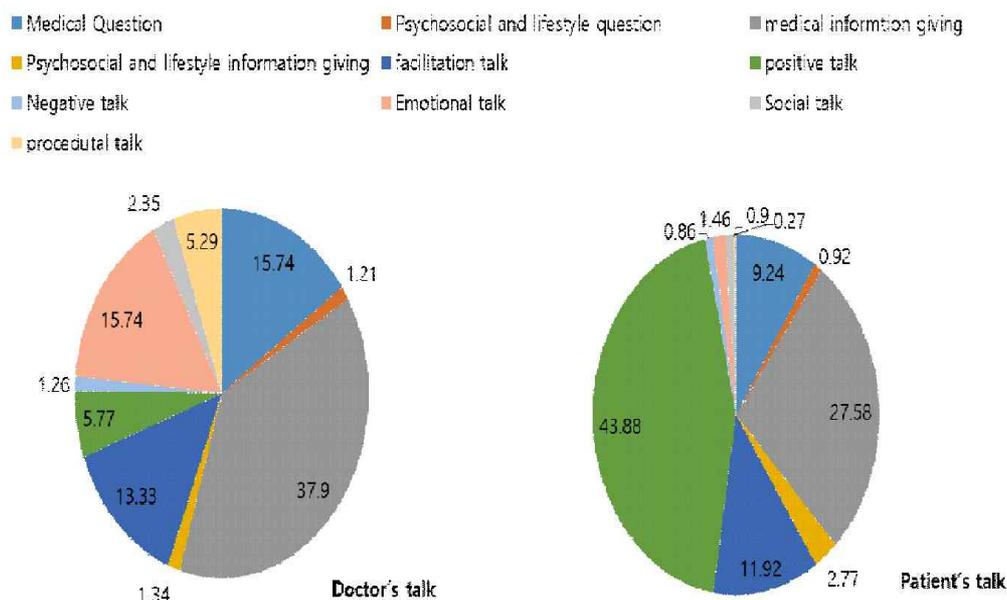


Figure 3. Utterance frequency in doctor's talk and patient talk

Medical information giving was frequently used in doctor's talking. Second was emotional talk which was 15.74 times per doctor's talking. Third was medical questions to patient (15.15 times) and fourth was facilitation talk (13.33 times). Doctor used positive talk and procedural talk utterance 5 times per one doctor's talking. Social talk hold the sixth rank (2.35 times) and psychosocial and lifestyle information giving hold the seventh rank (1.34 times). Negative talk and psycho-social and lifestyle questions were very bottom of the rank which patient only talked them once in their talking. On the other hand, almost half of patient talk was frequently used positive talk which had 43.88 times per patient talking. The second was medical information giving (27.58), and the third was facilitation talk (11.92). The next was medical questions which was 9.24 times per patient talk and psychosocial and lifestyle information giving got the fifth place (2.77). 1.46 times was used in patient's emotional talk. Psycho-social and lifestyle information giving (0.92 times), social talk (0.90 times), negative talk (0.86 times), and procedural talk (0.27 times) were rarely used in patient's

talking.

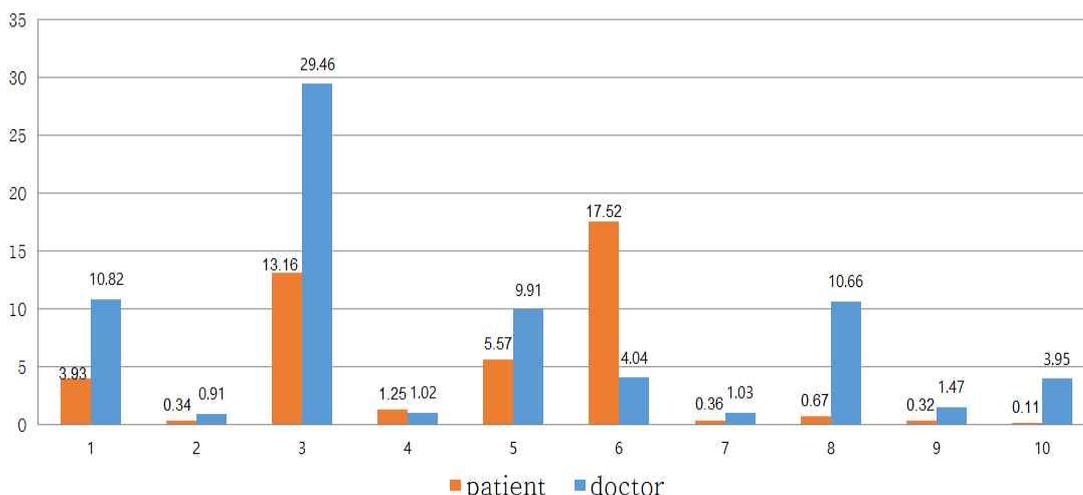


Figure 4. Mean number of total utterance for doctor and patient per consultation

Figure 4²⁾ was shown to compare mean utterance of doctor's talk and patient's talk per consultation. Most of mean number of doctor's communication clusters were higher than patient's communication cluster except for psycho-social and lifestyle information giving and positive talk. Sum of medical question and medical information giving occupied over half of doctor's talk whereas it was distributed one-fourth of patient's talk. For patient, sum of positive talk and facilitation talk was higher than sum of medical questions and medical information giving. Dominance of patient talk in consultation occupied about 37%, whereas doctor's talk occupied about 63% (Figure 5).

2) X-axis stands for communication variable whereas Y-axis represents mean number of utterance. 1: Medical questions, 2: Psychosocial and lifestyle 3: Medical information giving, 4: Psychosocial and lifestyle information giving, 5: Facilitative talk, 6: Positive talk, 7: Negative talk, 8: Emotional talk, 9: Social talk, 10: Procedural talk

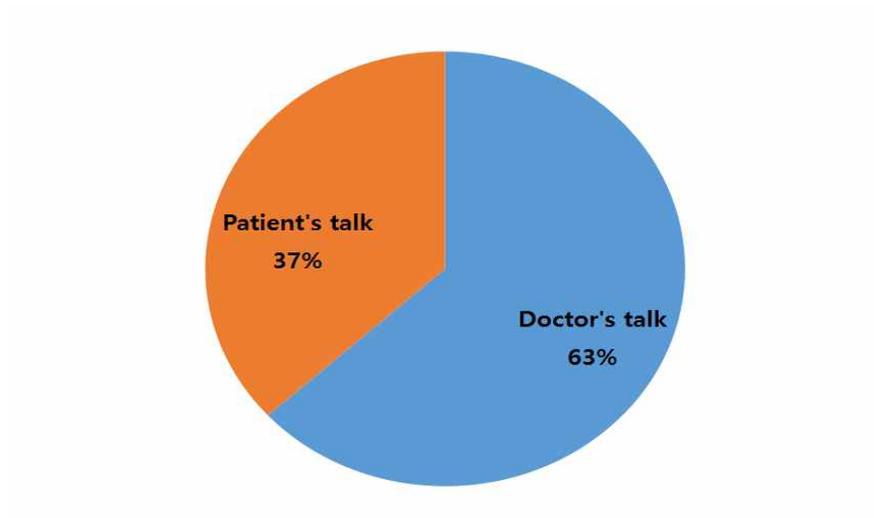


Figure 5. Patient and Doctor's talking Percentage occupied in one consultation

4.2 Correlation Analysis between Variables

Spearman's correlation was conducted to find out the association between the variables. Spearman's correlation was chosen because of dependent variable which was ordinal scale. First of all, patient's trust toward doctor, patient's expectation, patient's self-efficacy in communication, doctor's positive talk, patient's facilitation talk were negative correlation with satisfaction gap between patient and doctor. For independent variable gender had same correlation result with satisfaction gap except age, belief, and doctor's facilitative talk. Age had positive correlation with income, presence of accompany, and doctor's positive talk. On the other hand, doctor's open-ended questions, doctor's closed-ended questions, doctor's facilitative talk had negative correlation with age. Income had positive correlation with presence of accompany whereas negative correlation with doctor's facilitation talk. Patients' perceived health was negative correlation with patient's trust, patient's self-efficacy, and patient's belief. Like this, each independent variables had negative or positive correlation between independent variables. Age and income had positive relationship which was over 0.5. Length of consultation and number of visit had negative correlation. Trust had positive correlation with self-efficacy which was over 0.5. Above all, there were no strong correlation between the variables that had any problems to use regression. Table 10 is shown in detail.

Table 10. Spearman correlation between variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	1.000																								
2	.352**	1.000																							
3	.168	.594**	1.000																						
4	.137	.130	-.007	1.000																					
5	.028	.324**	.388**	.174	1.000																				
6	.015	.108	.091	.258**	-.065	1.000																			
7	-.131	-.017	.059	-.104	.112	-.537**	1.000																		
8	-.269**	-.040	.115	-.232*	.002	-.060	.126	1.000																	
9	-.183	-.115	.015	-.139	-.034	-.041	.068	.448**	1.000																
10	-.338**	-.119	.091	-.305**	.041	-.212*	.248*	.559**	.480**	1.000															
11	-.225*	-.185	.047	-.223*	-.060	-.108	.124	.435**	.411**	.478**	1.000														
12	-.198*	-.322**	-.162	-.010	-.042	.062	.165	-.042	.084	.122	.125	1.000													
13	.145	-.242*	-.111	-.071	-.217*	-.015	-.017	.026	.053	.043	.099	.124	1.000												
14	-.098	.092	.041	.083	.030	.288**	-.282**	.131	-.092	.004	-.049	-.241*	-.360**	1.000											
15	.048	-.094	-.040	.045	.021	-.112	-.026	-.122	-.016	-.063	.003	-.076	-.062	-.400**	1.000										
16	.014	.024	-.082	.021	-.022	-.190	.163	-.003	.080	.089	-.033	.025	-.101	-.055	-.021	1.000									
17	-.252*	-.410**	-.252*	.072	-.081	-.049	.097	-.081	.134	-.078	.028	.340**	-.149	.021	.313**	.184	1.000								
18	.043	.235*	.127	.007	.100	-.101	.216*	.058	-.025	.052	-.034	-.132	-.142	.006	-.082	.027	.002	1.000							
19	.022	.181	-.064	-.124	-.087	-.021	-.085	.018	-.178	-.007	-.080	-.396**	-.308**	.383**	-.143	.093	-.106	.254**	1.000						
20	-.021	.022	-.045	.084	-.038	.301**	-.092	-.098	-.038	-.045	.003	.402**	.202*	-.295**	-.214*	-.277**	-.264**	-.137	-.251*	1.000					
21	.116	.155	-.013	-.072	.004	.185	-.231*	-.029	-.090	-.047	-.183	-.094	-.105	.017	.042	.227*	-.131	-.109	.147	.117	1.000				
22	-.233*	-.034	-.069	-.059	-.050	.112	.094	.258**	.270**	.228*	.173	.141	.112	-.002	-.036	.001	.067	.156	.000	.052	.001	1.000			
23	-.022	-.020	.102	-.191	.157	-.306**	.213*	.121	.093	.055	.044	-.267**	-.045	.073	-.051	-.044	.019	-.019	.039	-.495**	-.322**	-.099	1.000		
24	.030	-.187	-.139	.161	-.066	.167	-.180	-.438**	-.272**	-.442**	-.141	-.096	.109	.032	.003	-.124	.023	-.303**	-.097	.052	.080	-.223*	-.017	1.000	

1. gender 2. age 3. income 4. perceived health 5. presence of accompany 6. length of consultation 7.number of visit 8.trust 9.expectation 10. Self-efficacy 11.belief 12. doctor's open-ended questions 13. doctor's close-ended questions 14. doctor's information giving 15. doctor's directive talk 16. doctor's emotional talk 17. doctor's facilitative talk 18. doctor's positive talk 19. patient's questions 20. patient's information giving 21. patient's emotional talk 22. patient's facilitative talk 23. patient's positive talk 24. Satisfaction differences between doctor and patient

*: p<0.05, **: p<0.01

4.3 Differences between Patient Self-reported Satisfaction and Doctor's Perceived Patient Satisfaction

Research question1) Is there any difference between patients' self-reported satisfaction and doctors' perceived patients' satisfaction in outpatient setting?

Since satisfaction gap between patient and doctor was not follow the normal distribution, Wilcoxon signed Ranks test was measured to analyze the mean differences between patient and doctor (Table 11). Each five patient PSQ were compared to five doctor PSQ. As the result of Wilcoxon signed rank test, all of the doctors' five items rank means were higher than patients' five items. Moreover, there were statistically significant differences in patient and doctor's satisfaction for needs address ($p < .001$), patient's involvement ($p < .001$), information given by doctor ($p < .001$), emotional support ($p < .001$), and interaction in general satisfaction ($p < .001$).

Table 11. Mean satisfaction score and difference analysis using Wilcoxon signed ranks test

Scale of PSQ	Patient satisfaction Mean(SD)	doctor Satisfaction Mean(SD)	Z	P
Needs addressed	86.33(12.03)	97.94(3.45)	-7.401	<.001
Patient 's involvement	80.09(16.70)	95.24(5.11)	-6.840	<.001
Information given by doctor	87.25(12.23)	95.83(4.02)	-5.783	<.001
Emotional Support	86.06(13.37)	94.85(9.457)	-5.587	<.001
Interaction in general satisfaction	88.15(12.04)	96.26(4.62)	-5.800	<.001

4.4 Factors Affecting to Satisfaction Gap between Patient Self-reported and Doctor's Perceived

Research question 2) Which factors influence the satisfaction differences between patient and doctor score on patient satisfaction?

Assumption 2-1 patient' s self-reported satisfaction has relationship with satisfaction gap between patient and doctor

Assumption 2-2 Doctor perceived patient satisfaction has relationship with satisfaction gap between patient and doctor

Assumption 2-3 patient' s self-reported satisfaction has relationship with doctor perceived patient satisfaction.

Spearman's correlation was measured before using logistic regression to find out association between patient satisfaction, doctor's perceived satisfaction and satisfaction gap between doctor and patient. Hypothesis 2-1 and hypothesis 2-2 were supported according to Spearman's correlation result. Patient satisfaction had strong positive relationship satisfaction gap while doctor's perceived satisfaction had negative weak relationship with satisfaction gap. No correlation was shown between satisfaction gap and doctor's perceived satisfaction. Table 12 was shown the result of spearman's correlation.

Table 12. Spearman's correlation among patient satisfaction, doctor satisfaction and satisfaction gap

	patient satisfaction	doctor satisfaction	satisfaction gap
patient satisfaction	1		
doctor satisfaction	-.094	1	
satisfaction gap	.960**	-.350**	1

*: p<0.1 ,**: p<0.05, ***: p<0.01

Ordinal logistic regression was conducted to examine the factors affecting to gap between patient self-reported satisfaction and doctor's perceived satisfaction. Table 13 showed that age, number of visit, trust, patient's self-efficacy in communication, doctor's open-ended questions, and doctor's positive talk were the factors to affect the satisfaction gap. Older patient were likely to narrow the satisfaction gap between patient and doctor. High ranks of patients who had large satisfaction gap had tendency to visit more than low ranks of patients. It meant that number of visit were negatively related to satisfaction gap. Both patient-doctor relationship factor and patient attitude and belief factor affected to patient satisfaction gap. Satisfaction gap got smaller when patient trust more in doctor. Moreover, high level of patient's self-efficacy in communication had positively affected on narrowing gap. When the doctor asked with open-ended questions about all topics such as medical, therapeutic regimen, psychosocial and lifestyle circumstances, the satisfaction gap got smaller. Doctor's positive talk during the consultation had significant positive influence on narrowing the gap.

Table 13. Factors affecting to satisfaction gap

Variable	β	SE	Wald	OR	95% CI	P
Age	-0.03	0.01	-1.73	0.97	0.94-1.00	0.08*
Gender	-0.67	0.53	-1.25	0.50	0.18-1.46	0.20
Education	-0.20	0.25	-0.83	0.81	0.50-1.33	0.40
Income	0.04	0.08	0.47	1.04	0.88-1.23	0.63
Perceived subjective health	-0.06	0.28	-0.24	0.93	0.53-1.63	0.80
Presence of accompany	-0.38	0.47	-0.79	0.68	0.27-1.75	0.42
Number of visit	0.09	0.05	1.82	1.10	0.99-1.23	0.06*
Consultation time	0.00	0.00	0.90	1.00	1.00-1.01	0.36
Trust	-1.13	0.48	-2.34	0.32	0.12-0.83	0.01**
Patient's self-efficacy in communication	-1.40	0.66	-2.09	0.24	0.07-0.91	0.03**
Expectation	-0.07	0.40	-0.19	0.92	0.42-2.04	0.84
Illness belief	-0.04	0.57	-0.07	0.95	0.31-2.96	0.93
Doctor's open-ended questions	-2.09	1.22	-1.71	0.12	0.01-1.35	0.08*
Doctor's close-ended questions	0.82	0.92	0.89	2.29	0.37-14.02	0.36
Doctor's information giving	0.36	0.49	0.73	1.44	0.54-3.84	0.46
Doctor's directive talk	-0.40	0.46	-0.86	0.66	0.27-1.66	0.38
Doctor's emotional talk	-0.46	0.94	-0.49	0.62	0.10-3.97	0.62
Doctor's facilitative talk	-0.82	1.33	-0.61	0.43	0.03-5.96	0.53
Doctor's positive talk	-2.82	1.12	-2.51	0.05	0.01-0.54	0.01**
Patient's questions	-1.13	1.00	-1.13	0.32	0.04-2.29	0.25
Patient's information giving	-0.07	0.67	-0.11	0.92	0.25-3.49	0.90
Patient's emotional talk	0.27	2.06	0.13	1.31	0.02-74.81	0.89
Patient's facilitative talk	-1.59	2.71	-0.58	0.20	0.00-41.71	0.55
Patient's positive talk	-0.20	0.65	-0.31	0.81	0.22-2.96	0.75

*: p<0.1 ,**: p<0.05, ***: p<0.01

4.5 Comparison of Communication Style according to the Satisfaction Gap Differences

Figure 6³⁾ compared the communication style pertain to satisfaction gap differences. Comparison was taken with two group between high satisfaction gap and low satisfaction gap. High satisfaction gap group had higher percentage in doctor's closed-ended questions, doctor's information giving, doctor's facilitative talk, and patient's information giving. Group which had low satisfaction gap had higher percentage in doctor's open-ended questions, doctor's directive talk, doctor's emotional talk, doctor and patient's positive talk, patient's questions and patient's facilitative talk. Patient's emotional talk had similar percentage in two groups.

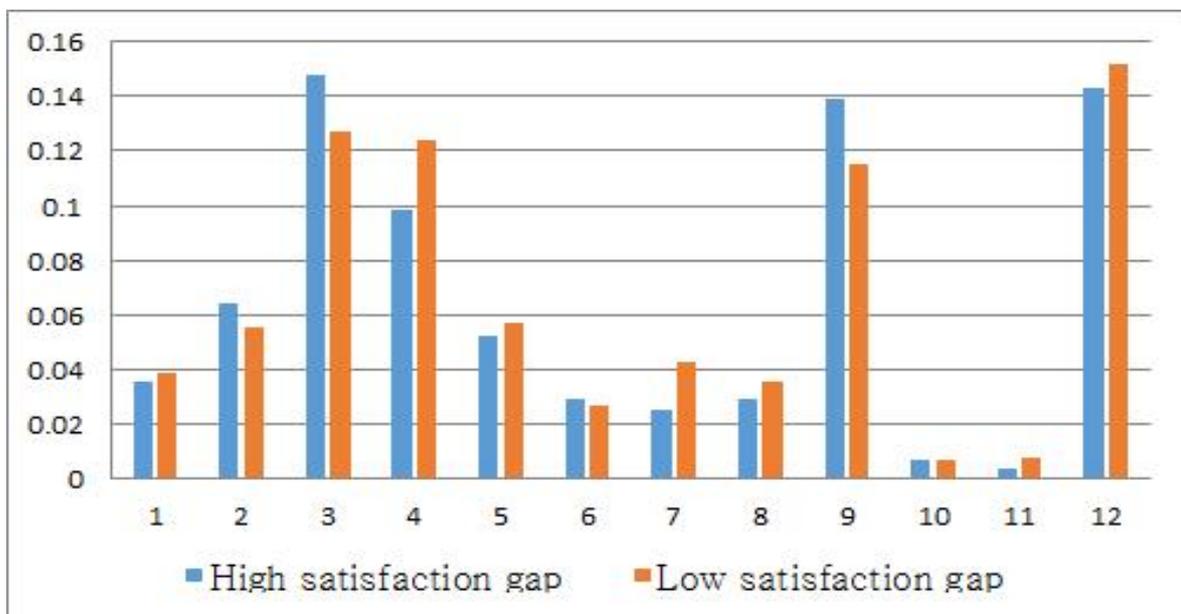


Figure 6. Comparison of communication factors between high and low satisfaction group

3) X-axis stands for communication variable and Y-axis stands for percentage in one dialog. 1: Doctor's open-ended questions, 2: Doctor's close-ended questions, 3: Doctor's information giving, 4: Doctor's directive talk, 5: Doctor's emotional talk, 6: Doctor's facilitative talk, 7: Doctor's positive talk, 8: patient's questions, 9: Patient's information giving, 10: Patient's emotional talk, 11: Patient's facilitative talk, 12: Patient's positive talk.

5. Discussion and Conclusion

5.1 Summary of Result

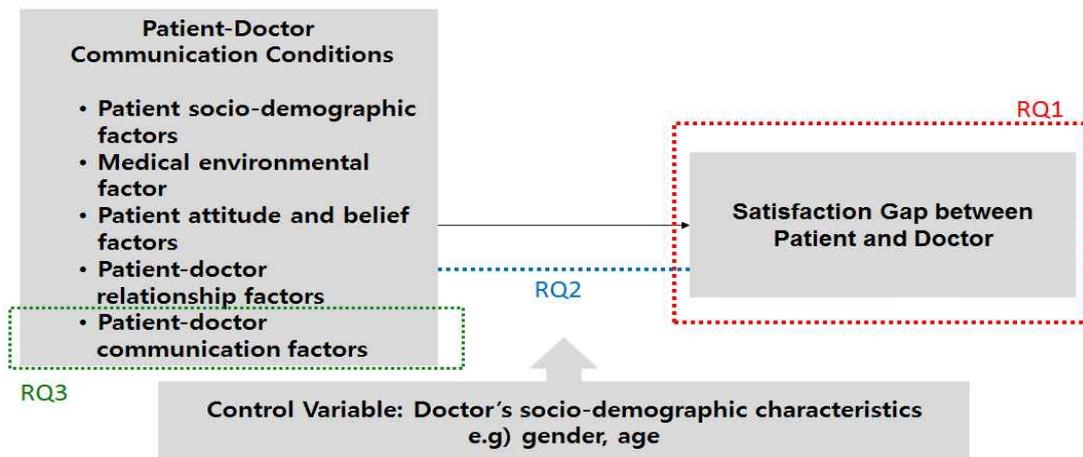


Figure 7. Revised Research Model

The revised research model reflecting the results of this study is as following Figure 7. The purpose of this study was to find out there was satisfaction differences between patient and doctor and explore affecting factors to shorten the satisfaction gap. Moreover, present study aimed to analyze medical communication in real time and compared communication style according to satisfaction gap differences by using RIAS in Korea.

There were significant perception differences between patient and doctor such as need addressed, patient's involvement, information given by doctor, emotional support and interaction in general satisfaction. Also, doctor pretended to rate patient satisfaction higher than patient.

Determinants to affect satisfaction gap were medical environmental factor(number of visit), patient–doctor relationship factor(trust), patient's belief and attitude factor(self–efficacy in communication), and communication factor(doctor's open–ended questions, and doctor's positive talk).

By using the RIAS, present study found that there were different communication style between doctor and patient. Medical information giving was frequently used in doctor whereas positive talk was used in patient. Result confirmed that doctor took up predominant in medical communication. Moreover, group which had high satisfaction group communication style was different from low satisfaction group. Doctor's closed-ended questions, doctor's information giving, doctor's facilitative talk, and patient's information giving occupied higher in high satisfaction gap group. Low satisfaction group had features in high percentage in doctor's open-ended questions, doctor's directive talk, doctor's emotional talk, doctor and patient's positive talk, patient's questions and patient's facilitative talk.

5.2 Implication

There was a significant differences in each five patient satisfaction items by comparing patients' self-reported satisfaction and doctor's perceived patient satisfaction. These results were consistent with previous studies that had difference between patient satisfaction and doctor's predicted patient satisfaction(Mckinstry, Colthart &Walker, 2006). Present study found that doctor pretend to predict that their patient would have high satisfaction which did not follow the Precedent researches(Sebo, Herrmann & Haller, 2015;Cannon and Usherwood, 2007). This could be interpreted as reflecting the different cultures, perceptions toward health workers, and attitudes of health workers. Above all, data collection hospital had in common that had long waiting time to have treatment. Patients who had treatment had too much pain to wait so that their satisfaction could relatively high.

Age was positive relationship with satisfaction gap. Various explanation could be advanced that it resulted from their experiences. Prior experiences that caused low expectation could affect to the satisfaction gap. The elder were likely to good at self-control and accept in certain circumstances more than the young. In addition, older patient had more respect and admiration toward doctors that came from their generational effects (Crow et al., 2002).

Number of visit was negative relationship with satisfaction gap which was also following the result that number of visit was negative association with patient satisfaction(Mirowsky & Ross, 1983). The fewer patient visited to hospitals, the more the patient satisfaction gap narrowed. It seemed to think that higher number of visit could be implied that the treatment did not work. If patient's prognosis was good, patient did not need to come the hospital anymore. For that reason, patient's who visited hospital more time had high level of dissatisfaction. Another possibility is that expected duration of treatment was different from patient and doctor(Crow et al., 2002). The doctors thought that the patients would not have to come to the hospital so they deterred their patients from coming

to the hospital. Also, patient wished to stop visiting hospital to avoid monetary expenditure. Moreover, patients wished to recover or lessen their pain as soon as possible could affect. They were likely to think that end of visits meant the recovery of their illness.

Doctor's Open-ended questions had positive effect on reducing satisfaction gap as well. Doctor's open-ended questions had also significantly influence on patient satisfaction(H. Ishikawa et al., 2002). Nevertheless present study and his study had different measurement, his study and present study had both similar and different results. His study disclosed that doctor's open-ended questions, doctor's direction, doctor's emotional responsiveness and patients' questioning were positive relationship with patient satisfaction in oncology setting. Different study setting could make different results but most important things were doctor's open-ended questions were both important predictors in patient satisfaction and satisfaction gap.

Doctor's positive talk affected not only patient satisfaction but also satisfaction gap. The reason why doctor's positive talk shorten the gap was that patients had tendency to predict their health condition better when their doctor had more positive talk. Moreover, doctor pretended to talk more positive when their patients' prognosis were favorable. Doctor's positive talk worked as facilitator to motivate management of patient care. Example of positive talk: "Your foot are getting pretty.", " You are good at taking care of swelling."

Compared to other countries, trust toward doctor were extremely high in South Korea(Kim &Cho, 2011). Present study supported that trust also affected to satisfaction gap. High trust toward doctor made patient open-minded to doctor so that patient talked their preference more comfortable and doctor understood what their patients really wanted. Those mutual interaction shortened the satisfaction perception between doctor and patient.

Gender, education, income, perceived subjective health, consultation

time, presence of accompany, expectation, illness belief resulted no significant relationship with satisfaction gap. Communication factor such as doctor's close-ended questions, doctor's directive talk, doctor's emotional talk, doctor's facilitative talk, doctor's positive talk, patient's questions, patient's information giving, patient's emotional talk and patient's positive talk had no significance with satisfaction differences as well. Various explanations were advanced the reason why those factors were not significant in satisfaction gap. It might reflect priority of both patient and doctor in satisfaction. Factors listed in present study were important factors in patient satisfaction. Each factors might have intimate connections that certain factors were prior to satisfaction rather than the others. Moreover, it could mirror health system of Korea that quality of care depended more on quality of communication rather than quantity of time.

Present study visualized real time medical communication condition using by RIAS. Result supported that still medical communication was leaded by doctors despite the emergence of patient-centered care. Positive talk and medical information giving were frequently used among each doctor's talk and patient's talk. Psycho-social and lifestyle question was rarely used in doctor's talk and procedural talk ranked the last in patient's talk. Based on the RIAS analysis, present study predicted the reason why there was the satisfaction differences between patient and doctor.

First, the medical communication was leaded by doctor rather than patient. As mentioned before, doctor participated in 63.23% of conversation whereas patient accounted for 36.77% on average per one consultation(Figure 5). This implied that one-way conversation was mainly performed rather than the interactive conversation. One-sided communication could not lead equal right in decision making in medical treatment and aggravated the communication gap if patients did not understand what doctors said. Particularly in department that had lots of information exchange to determine many choices and explanation could be explained this situation.

Second, different priority made satisfaction gap. About 50% of doctor talk was made up of medical questions and medical information giving, but they only occupied about 20% in patient talk. Furthermore, half of patient conversation were consisted of facilitative talk and positive talk while they took about 20% in doctor conversation. Different priority signified that doctor did not grasp patient's need and patient did not actually deliver what they wanted. This was because patient illustrated their emotional appeals about their pain rather than symptoms which was based on the scientific evidences(Lee, 2000; Lee, 2011). Doctor's impatient attitude also caused the predominant talk in consultation(Lee, 2000). Since medical consultation was held in very short time, doctors were likely to listen only what they wanted and rushed patient to talk with clear statement. Those attitude encouraged doctor to ask open-ended questions frequent and it promoted the circumstances to participate patient as passive decision makers.

There is no doubt that communication affects patient health outcomes and patient satisfaction. To increase the quality of medical care and satisfaction, previous studies measured and evaluated patient satisfaction, as the result of indicator of meidcal service. Academic world all agree that communication is a two-way information exchange, but so far, studies have been carried out that take into account the patient's unilateral patient satisfaction. With present study's result, several suggestions should be researched in advanced researches.

Theoretical basis is needed to explain this outcome. Present study is conducted with assumptions that determinants of patient satisfaction have influence on satisfaction gap as well. Framework or model of satisfaction gap should be required for future research. In order to improve patient satisfaction, it is desirable to set the patient-doctor relationship as the unit of analysis relationship and make efforts to include it into major variables.

There is a need to study doctor's perspectives and take into account when planning and modeling the study(Ong, de Haes et al., 1995). Especially, more attempts are needed to find out and measure the

communication variables of the healthcare provider, including the variables identified in this study. American Association of orthopedics Surgeons claimed that medical communication is so critical to form the relationship between doctor and patient that doctor should augment communication study to strengthen the communication skills. It is certain that patient participation in dialogue was less than 50%, there needs to emphasize to motivate patient to join in the conversation. Considering factors influenced on satisfaction gap depends on doctor's communication factors. Present study mainly focuses on doctors' communication style based on the RIAS basic categories. Other variables can be extracted from doctor's talk and it can play a critical role in quality of care. Doctor's socio-economic status, attitude, perception, prediction, and perception gap about patient's satisfaction should be followed at the same time.

It is necessary to identify the characteristics of the patients especially those who recognize the gap significantly and find the improvement for narrowing gap. In this study, we compared the differences in patient satisfaction by relative differences, and identified factors that may influence the difference between the two groups. Future research should be conducted to select patients with large differences in patient satisfaction and to narrow the gap. For example, in this study, the patient's basic disposition and temperament affected the satisfaction gap. This suggests that it is important to devise ways to increase the patient's self-efficacy and to find ways to increase trust in the doctors. Patient's self-efficacy could be improved by education to have more confidence in their statement or by illustration which explains about certain disease or treatment in bring out patient's levels. Also, it is necessary to classify patients with large patient satisfaction gap according to patient characteristics and diseases.

Medical communication between patient and doctor should be studied that could reflect that medical field. Good doctor is not only treat patients well but also treat them with warm heart. Emotional care should be went with treatment and it is the stepping stone to approach patient-centered care. But there have not been enough studies to analyze medical communication itself. Based on communication is the process of interaction,

future studies need to figure out the effective medical communication to approach reciprocal relationships. Present study collected data in medical communication of orthopedics department but future study could be held in different departments and compared each department to find the efficient communication strategies.

This study has advantage in analyzing the patient–doctor communication based on the recording of consultation in real time and extract the meaning of the dialog itself. It has possible to confirm which factors among the communication factors presented in the previous research have an effect on the gap between patient self–reported satisfaction and doctor's perceived patient satisfaction. Moreover, it will be an opportunity to be a beginning of exploratory Research to explain the satisfaction gap. It is one of the study to apply international method, RIAS, to contemplate satisfaction gap. It is necessary to use variety of international research approaches including RIAS. This study expects to trigger for patient centered medical care related researches.

5.3 Limitation

Present study had few limitation regarding sample size, representative of sample and interpretation of communication using RIAS. Small sample size could be a limitation on this study. Although doctor's characteristics were critical factors to influence patient satisfaction, present study decided them as control variables because of small number of doctor. Moreover, gender of the doctor could have influenced on the satisfaction gap that all of the doctors were male. Alternative statistical method could be existed because of small sample size too.

There were some limitation associated with representative of sample. The present study was conducted at two private hospital in department of orthopedics with outpatients. Thus, the result may not be directly applicable to general hospital and university hospital which had different characteristic of patients. Selection bias could be applied that patient who participated in study were likely to have favorable to doctors because they had already satisfied with their treatment. Likewise, data survey was conducted inside of the hospital could have bias that patients pretended to report high satisfaction level because they were afraid to having any disadvantages when they reported low-rated satisfaction.

Different result could be came according to standard of classification by ranking satisfaction gap. Objective distribution to rank the difference satisfaction depended on researcher's various perspectives. Present study reflected classification to divide three group(Kim & Ki, 1999) to reflect Korea context. However, classification to divide by two group could have possibility to have different result from present study. Like this, classification of rank have effects to interpret same results as different meaning. Therefore, study should be needed in various classification to divide rank in satisfaction gap.

Since RIAS were developed in the United states, classification of utterance could not be completely matched in our environmental settings. There could be a possibility to miss some important meanings during the consultation because of different medical circumstances, cultures, and interpretation of meaning.

This study was constructed depends on hypothesis that satisfaction gap had influence on factors which affected to the patient satisfaction. Therefore various affecting factor that have any relationship with patient satisfaction could exist. Independent variable was measured satisfaction difference so the result did not contain whether doctor's perceived satisfaction was higher or not. However, result examined the influence factors depending on whether the gap was large or small.

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Abstract (Korean)

환자-의사 면담 조건이 의료 서비스 결과 상호 인식에 미치는 영향: RIAS기법의 활용

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환자와 의사의 관계를 중요시 생각하고, 의사 결정에 있어서 환자의 선호와 의견을 중요시 여기는 환자-중심적 케어가 대두되고 있다. 의사-환자 면담은 환자-의사의 관계의 시작이자, 대화를 통해 환자의 기대를 파악하고, 서로 간의 합의를 통하여 생산적인 의사결정을 내릴 수 있다는 점에서 중요성을 가진다. 대표적으로 환자가 병원 내에서 경험하는 면담과 같은 의료 서비스를 평가하기 위해서 환자 만족도 조사가 활발히 이루어지고 있다. 하지만 국내에서는 환자의 인구 사회학적인 요인, 진료 환경요인, 의사-환자 관계요인에 따른 환자 만족도연구는 활발하나, 상대적으로 담화요인에 대한 연구는 미흡하다. 또한 대화와 상담을 쌍방향 커뮤니케이션 행위로 보고 그 시각에서 실증 분석하는 시도는 지극히 드물다. 또한 대화 분석에 필요한 방법론의 소개와 교육 및 훈련 부재가 또 하나의 이유로 생각된다. 그 결과, 만족도 조사를 고려한 환자 요인과 의사 요인의 포함에 대한 연구는 거의 이루어지지 않았으며, 쌍방향 소통의 영향과 관련 요인에 관해 알려진 바가 없는 실정이다.

본 연구는 환자와 의사의 만족도 차이를 측정하고 한국의 의사소통의 현실을 파악하기 위해 의사와 환자 상담 자체를 분석하기 위해 RIAS 방법을 사용하는 방법을 연구한다. 따라서 본 연구에서는 환자와 의사의 만족도에 차이가 있는지를 알아보고 만족도 격차에 영향을 미치는 요인을 조사 하였다. 또한 실시간 의사소통을 분석하여 그 결과가 만족도 차이를 설명 할 수 있는지 조사했다.

만 18세 이상 성인 중 녹취를 수락한 외래 환자 103명을 대상으로 환자-의사 면담을 녹취하고 설문지 조사를 하였다. 서울에 있는 개원병원 2곳에서 자료를 수집하였으며, 그 중 5명의 외과 의사가 연구 참여에 동의를 하였다. 환자의 설문 문항에는 환자의 인구사회학적 요인, 의사-환자 관계요인, 환자 태도 및 믿음 요인

과 환자 만족도를 측정한다. 의사의 설문 문항에는 의사가 생각하는 환자의 만족도와 의사의 나이, 성별을 측정한다. 녹취는 RIA를 통해 분석하여 면담 요인에 대한 요인을 추출한다. 환자가 자가 기입한 환자 만족도와 의사가 생각하는 환자 만족도의 차이를 알아보기 위해 Wilcoxon signed Ranks test를 실시하였고, 변수간의 상관관계를 확인하기 위해 spearman's correlation을 실시하였다. 만족도 격차에 영향을 주는 요인을 알아보기 위해 서열형 로지스틱 회귀분석을 수행하였다. 만족도 격차에 따른 의사와 환자의 커뮤니케이션 스타일을 알아보고, 정형외과에서의 환자-의사 대화 현황을 알아보기 위해 RIAS를 사용하여 분석하였다.

Wilcoxon signed Ranks test 결과 환자 만족도와 의사 만족도 차이에 유의미한 차이가 있음을 확인하였다. 예상했던 것과 같이 환자와 의사의 요소 모두 환자 만족도 격차에 영향을 주는 것으로 확인하였다. 서열형 로지스틱 회귀 분석을 통해 환자의 나이가 많을수록, 환자의 자기 효능감이 높을수록, 의사에 대한 환자의 신뢰도가 높을수록, 병원 방문이 낮을수록, 의사의 긍정적인 대화가 많을수록, 의사가 개방형 질문을 많이 할수록 만족도 격차가 줄어든다는 것을 확인하였다.

만족도 차이의 유무에 더하여, 본 연구는 gap의 크기별로 환자-의사의 소통 양상이 다른지를 분석하였다. 만족도 격차가 큰 그룹과 작은 그룹을 비교한 결과, 만족도 격차가 큰 그룹의 경우 작은 그룹에 비해 의사의 폐쇄형 질문, 의사의 정보 제공, 의사의 촉진성 대화, 환자의 정보 제공이 많은 것으로 확인되었다. 반면에 만족도 격차가 작은 그룹은 경우에는 의사의 개방형 질문, 의사의 지시, 의사의 감정적 대화, 의사와 환자의 긍정적 대화, 환자의 질문, 환자의 촉진적 대화가 상대적으로 높은 것으로 나타났다.

연구 결과를 토대로 본 연구는 다음과 같은 연구 시사점을 가진다. 향후에 환자 만족 제고를 위해서는 분석의 단위를 환자-의사의 관계로 설정하여야 하며, 주요 변수를 포함하는 노력이 필요하다. 이번 연구를 통해 밝혀진 변수를 포함하여, 중요하게 고려해야 할 의료인의 대화 관련 변수를 찾고, 측정하기 위한 더 많은 시도가 필요할 것이다. 또한 이번 결과를 설명하기 위한 이론적 뒷받침이 필요하며, 환자 중 특히 갭을 크게 인식하는 환자의 특성을 파악하고, 개선의 지점을 확인하여야 한다.

여러 가지 한계에도 불구하고 본 연구는 환자와 의사 만족도 격차가 있음을 확인하고, 그 격차를 환자-의사 면담을 직접적으로 들여다봄으로써 새로운 시도했다는 점에서 의의가 있다. RIAS를 비롯한 국제 연구의 접근법을 많이 활용하여 환자-의사 커뮤니케이션에 적극 활용할 필요성이 강조되며, 환자 중심 의료를 위한 관련 연구의 촉발을 기대한다.

Keywords: 환자-의사 커뮤니케이션, 환자 만족도 격차, 환자 중심적 케어, 커뮤니케이션 스타일, RIAS, 쌍방향커뮤니케이션, 환자-의사 상호작용

Student Number: 2015-241014)

* 논문은 2017년도 대한의사협회 의료정책연구소 석·박사 학위논문 연구비 지원사업으로 연구되었
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