

## Usefulness of medical review in the insurance claims

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### ■ ABSTRACT

**Background :** Many of internists have been working for insurance industry. Insurance medicine is use of medical knowledge for insurance industry. There is social role of insurance medicine in terms of soundness of insurance administration. Recently social role of internists also have been being watched.

Although theme of insurance medicine is medical risk selection, insurance claims administration also needs medical experts' opinion. There are not any corroborative study of medical consulting for insurance claims. Among insurance industry, someone called this medical review of insurance claims as 'medical claims review'.

**Aim :** To investigate usefulness of medical review of insurance claims.

**Design :** Questionnaire survey with claim staffs in one of insurance claim adjustment company in Korea.

**Methods :** 265 claim staffs were divided into 4 groups and conducted survey using a questionnaire of 20 questions. Utility score, job satisfaction score, and difficult factors of claims administration were measured.

**Results :** Utility score and job satisfaction score are highest in medical claims review group. The most difficult in claim administration to claim staffs was demonstrated to medical knowledge.

**Conclusion :** Medical review of insurance claims is proved to be worthy. Document-based consulting method, namely medical claims review, is more useful than telephone-based simple query among claim staffs...Subjects of the medical claims review are medical record and it's principle is independent medical examination with evidence-based approach, it also has role of protecting fraud of insurance claims. Two main question types of medical claims review are verification and advice.

**Key Words :** insurance medicine, claims, underwriting

### BACKGROUND

Nowadays people say much of social role of internists<sup>(1)</sup>. Insurance medicine is one of working fields of internist. So it is worth to try considering details of insurance medicine for internists. Insurance medicine is a medical contribution to insurance administration, and is divided in terms of function into fair pricing and accurate underwriting of the applicants and claims service, and in terms of content, into risk selection

and medico-actuarial research. Risk selection has been developed through mortality analysis<sup>(2)</sup>.

According to agenda in triennial conference<sup>(3)</sup> of the American academy of insurance medicine held in Miami during the period from the 12<sup>th</sup> to 16<sup>th</sup> of February, 2006, 14 out of 16 platform lectures were about risk selection, and only 2 were about claims. Even the two were on structured settlement and disability evaluation of disability income insurance, which were related to impaired life annuity and

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independent medical examination, respectively<sup>(4)</sup>. So, strictly speaking, they were less relevant to claims. In addition, 11 out of 12 lectures in the small group workshop were about risk selection. This suggests that claim has been pushed aside from the center of insurance medicine.

Many emerging insurance markets such as Korea however, there are some problem in risk selection, namely medical underwriting. First, it lacks mortality research that bases the development of the underwriting guideline, second, there is customer attitude of unreasonable claims, and third, marketing environment is another obstacle to medical underwriting. What is more, life insurance products in emerging market contain so various riders that they bear the characteristics of health insurance<sup>(5)</sup>. Because of the characteristics of health insurance, claim staffs are required to have extensive medical knowledge and are often in need of medical specialists' advice. In reality, they sometimes ask medical directors in their company or use external physicians for professional opinion. Lee<sup>(6)</sup> had reported role of medical consultation in insurance claims administration in an emerging market. He called that medical consultation as 'medical claims review'.

Consulting methods are also diverse, not only using simple question and answer by telephone but also utilizing attending physician's statement as the ground for adjusting claims. One of insurance claim adjustment companies in Korea is operating a unique medical consulting system called 'medical claims review,' in which enquiries are answered in written form and materials are maintained permanently and accessible at any time through the in-house intranet. In addition, the system is characterized by the facts that medical opinions satisfy insurance principles, that there are a number of predefined question types focused on claims decision, that evidence-based medical approaches are made, that the principle of independent medical examination<sup>(7)</sup> is observed, etc. Such a medical consulting system is considered useful, but in fact it has not been proved scientifically in terms of validity, reliability and soundness. Accordingly, we need corroborative research on this.

What should be studied first in scientific research on medical review of insurance claims is the usefulness of the system. Second, the validity of the system should be evaluated and the cost-effectiveness should be analyzed. Lastly, we need to develop methodologies applicable to field works. The present

study is about usefulness, the first work. In research on usefulness, its subjects are claim staffs, its scope is claim field, and its contents are claims administrations.

## MATERIALS AND METHODS

The subjects of this study were 265 claims staff members working at SIS Insurance Claim Adjustment Co, Ltd. who could answer the questionnaire survey. They were divided into 4 groups — N, SQ, MCR and A. Group N engaged in claim service before 1999 and have never experienced medical consulting in the course of their claims service, Group SQ engaged in claims service during the period from 1999 to July 31, 2002 and experienced a simple question-and-answer-type medical consulting system by telephone. Group MCR have been engaged in claims service since August 1, 2002 and use medical claims review, a document-based medical consulting system as it is currently. Group A has experienced both simple query and medical claims review. Table 1 shows the size of each group and the distribution of experience in claims service. This research conducted a survey using a questionnaire composed of 20 detailed questions. Statistical analysis used SPSS for Windows(version 12.0.0. 2007, SPSS Co. Chicago, IL)

## RESULTS

### Question No. 3 : measuring utility score, "How useful is medical consulting for claims decision?"

It was answered by giving a score between 0 and 100. Figure 1 compares the score of usefulness between two subject groups divided based on 10 years' experience. Compared to those with 10 years or longer experience, those with experience less than 10 years showed a high score of usefulness. This suggests that medical consulting is more useful to those with less experience. Utility scores of each study groups are showed in Figure 2.

### Question No.8 : measuring job satisfaction score of claim staffs during their work

This question was used as an instrument for measuring job satisfaction. It contained 10 detailed questions, 5 in a positive direction and 5 in a negative direction. They used 4-point Likert scale. This instrument is a scale measuring a concept. So, complete satisfaction may be 40 points.

Usually, reliability changes according to random error and nonrandom error<sup>(8)</sup>. There are a number of statistical tools for testing reliability, but Cronbach's  $\alpha$  is used most commonly. In this study, Cronbach's  $\alpha$  for the instrument in Question No.8 was high (0.944), and when it was recalculated with excluding one of the 10 detailed questions, it never exceeded Cronbach's  $\alpha$  for the whole. This means that Question No.8 was statistically reliable and there was no detailed question affecting the overall reliability. Table 2 shows the score of job satisfaction according to group. The mean score of job satisfaction was highest in Group MCR, and when the four groups were analyzed through one-way ANOVA, differences in the score of job satisfaction among them were statistically significant. In multiple comparison as a post-test, the score of job satisfaction in Group MCR was higher than that in Group N or SQ.

#### **Question No. 6 : question about difficult part of insurance administration for claim staffs**

Question No. 6\_1 was "What is most difficult in claim administration?" The question suggested instances and allowed the respondent to choose more than one. In descriptive statistics using a dummy variable for multiple replies, the most frequent answer was "medical knowledge for claims decision," which was chosen by 49.8% of the respondents.

Question No. 6\_2 asked "How many medical questions are raised in each claim case?" and answered by numerical value.

#### **Question No.7 : preference of consulting methods**

Question No. 7\_1 asked only Group MCR, SQ and A. "Which do you prefer between simple query and medical claims review?" The respondents marked a position on a 4cm line and the score was given as an interval variable. According to the result, preference for medical claims review was obvious (Figure 3).

#### **Question No.9 : feedback from customer company for claim service**

This question asked claim staffs who are working for customer satisfaction representatives for client company. It was to evaluate the customer company's attitude and satisfaction of claims service. Because medical claims review is requested in written form, its procedure is more complicated than simple query. Nevertheless, the respondents evaluated the reception procedure positively. They were also positive to the period of processing, and the present company's clients were

also favorable to the system (Figure 4)

#### **Question No. 10 'necessity' or 'not' of medical review of insurance claims and as a independent variable for regression analysis of job satisfaction score**

This study attempted to formulate a regression model on job satisfaction score. It was to prove the usefulness of medical consulting by developing a model explaining satisfaction with claims service. The dependent variable was job satisfaction score, and the independent variables were selected from items showing high correlations among them. In SPSS multiple regression analysis, variables were selected through the stepwise method. As question No. 10, existence and nonexistence of 'necessity' of medical consultation, which was a categorical variable, it was converted into a dummy variable.

#### **Regression analysis of job satisfaction score**

In the result of correlation analysis before linear regression analysis, the number of medical questions in Question No. 6\_2 showed a high correlation coefficient (0.855). In the results of the linear regression analysis, the ANOVA table was statistically significant at  $p < 0.005$ , and in the coefficients, both the constant term and the number of medical questions were statistically significant at  $p < 0.05$ . This means that, in explaining job satisfaction score, there is statistically significant possibility that the number of medical questions may be different from gradient 0.

If the formulated regression model expresses the number of medical questions with  $V_{6,2}$ , it becomes  $10.75 + 5.56 V_{6,2}$ . The correlation of the 'necessity' dummy is insignificant but if it is included in the model, the model becomes  $10.75 + 5.56 V_{6,2} + 0.699 \text{dummy}$ . And thus if 'necessity' is "Yes" it is  $11.45 + 5.56 V_{6,2}$  and if "No",  $10.75 + 5.56 V_{6,2}$ .

As in principle a regression model should be simplified as much as possible,  $10.75 + 5.56 V_{6,2}$  was adopted as the final model.

#### **Question No.11 : question type of medical claims review**

On the other hand, Question No. 11 asked about frequency of the type of question. It contains 10 detailed items. Detailed item number  $V_{11,1}$  was "What's claim diagnosis of the insured?",  $V_{11,2}$  "Is it cancer or not?",  $V_{11,6}$  "What is causality?", and  $V_{11,8}$  "Is hospitalized treatment necessary?" etc. Each detailed item was given a score out of 4 (very frequent), 3 (frequent), 2 (occasional) and 1 (rare). Although

these questions were not directly related to usefulness, they were asked in order to find important question types in the practice of medical claims review.

Factor analysis was conducted in order to extract key items out of the 10 detailed question types. Factor analysis is a principal component analysis method, and varimax rotation was used. Two factors were extracted through a Scree plot, according to the statistics of rotated component matrix, Item  $V_{11.1} \sim V_{11.5}$  were integrated into one factor, and item  $V_{11.6} \sim V_{11.10}$  into the other. The extracted two factors could explain 79.43% of the items under Question No. 11, and they were named 'verification' and 'advice', respectively. It is because Question No. 11\_1~11\_5 are all related to verification of insurance benefits and No. 11\_6~11\_10 to advice for claim staffs, who can get persuasiveness to insured about claim decision

## DISCUSSION

Usefulness can be proved by using the method that a gold standard is hypothesized and it is adopted as a dependent variable and then a regression model is formulated using various external environments as independent variables and the dependent variable is explained with the independent variables. Hong et al[9] had reported usefulness of credit insurance system in Korean insurance market by above methods.

Here if the dependent variable is a binary, there are a number of problems in using multiple regression analysis. First, the variance of the error term is not equal and this violates homoscedasticity, a classical hypothesis of linear regression models, and accordingly, the regression model does not have a quantitative meaning. Second, the value of the dependent variable is 0 or 1 and as a result there are two error terms, showing binary distribution, and this violates the hypotheses of normal distribution. Lastly, there is the possibility that the probabilistic hypothesis of regression coefficient estimates is destroyed. Consequently, for a binary dependent variable, complicated logistic analysis has to be used. Thus, the present study created a regression model through simple multiple regression analysis as an instrument composed of Likert scale total scores that have the meaning of interval variables.

As a result, we drew the conclusion that job satisfaction can be explained with the number of medical questions and found that medical questions are the hardest part of claims

administration. From these, it was inferred that medical questions are answered properly in claim cases through medical consulting, claim staff's job satisfaction will be enhanced. In addition, with regard to the form of medical consulting, it was confirmed that document-based methods, medical claims review, is preferred to simple query by telephone.

In conclusion, the usefulness of medical claims review was proved through this study. An additional fact found in this research is that question types can be simplified into benefit verification and advice for claims staffs. Due to its principle of independent medical examination, the medical review of insurance claims can have protective role against previously reported<sup>(10)</sup> "lying for insurance system".

However, this study has a limitation in that the number of respondents was around 260 and only one insurance claim adjustment company was studied. Further research is considered necessary to prove the validity and soundness of medical consultation of insurance claims.

**Table 1.** Numbers of examinee among each group and their experience of insurance claims administration

	N	SQ	MCR	A	Total
No.	41	97	103	24	265
Experience (yr)	9.75±1.4	8.81±3.2	5.20±0.6	10.8±3.1	7.80±3.2

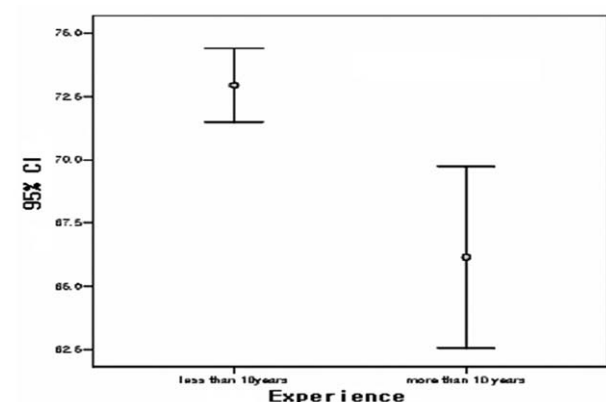
**Table 2.** Comparison of job satisfaction scores between 4 groups

Group	(n)	m±S.D.	F(p)
N	24	31.96±9.6	
SQ	97	33.93±8.8	10.845(0.000)*
MCR	103	38.16±1.6	N, SQ < MCR
A	41	35.41±2.6	

\* statistically significant at  $p = 0.001$

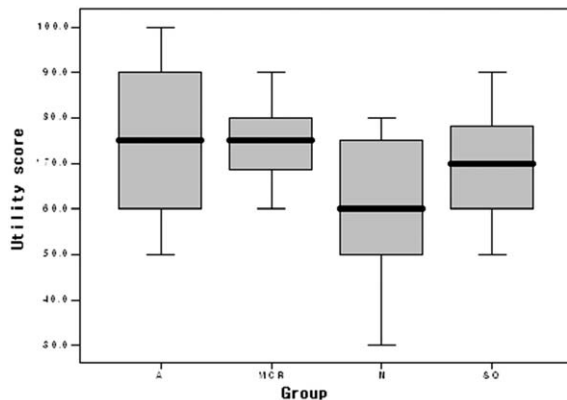
**Figure 1.** This figure shows comparison of utility scores between experience

experience	< 10 yrs	≥ 10yrs
m ± S.D.	72.9±1.61	66.15±3.75
T(p)	22.33(0.000)*	

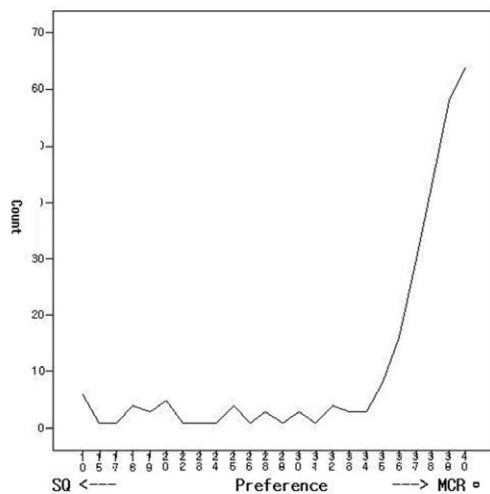


\* statistically significant at  $p=0.001$

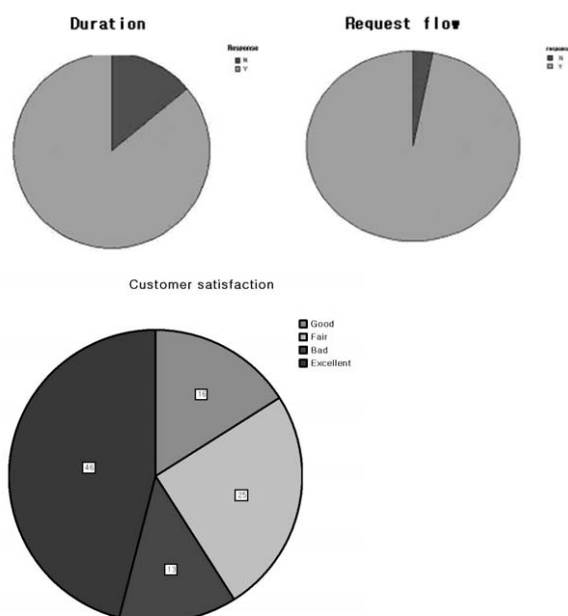
**Figure 2.** This figure shows box plot of utility scores among groups, inter quartile range



**Figure 3.** This figure shows different preference between the group of simple query and medical claims review



**Figure 4.** Feedback of medical claims review



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