
Comparative Study on the Use of Pharmacist Advice between U.S. and Korea

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This study investigated the differences in the use of pharmacist advice between the U.S. and Korean university students. The variations in a person's decision to use pharmacist advice in response to symptoms were examined based on Andersen's model.

A pre-experiment was conducted for the students taking similar courses using a self-administered questionnaire. For the 18 hypothetical symptoms, they were asked to decide how to respond to each of them for 7 days.

After controlling for the symptom severity, U.S. students were apt to use pharmacist advice for less days, no matter how they perceived them. The results also showed that there were meaningful differences in the use between two countries after adjusting for differences in the predisposing, enabling, and need characteristics.

A revised four stage model was successful in explaining the differences in the utilization. Application of modified version of Andersen's model to U.S. and Korean university students yielded very unique findings, where the most predictive power was in predisposing variables. The meaning of the "country" was discussed in relation to the difference in the drug regulatory environment.

I. Introduction

One of the pharmacist's most important professional functions is to provide informa-

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tion and advice in his area of expertise. Pharmacists practicing in the community find numerous opportunities to provide professional advice to laymen. As specialists in the drug use, they have the potential to be a primary source of information about drugs. In the more general area of health education, information can be distributed and patients

can be counseled on a wide variety of health issues. Drug abuse education, immunization programs, and diabetes detection efforts are but a few examples of how pharmacists can contribute.

The role of the pharmacist as a health care professional has gained importance with the changes in the health care environment in the U.S.¹⁾ The 1960s and early 1970s provided an environment of expansionist policy and social reform, which were intended to improve access to health care and availability of services in order to increase utilization via a financing mechanism, organizational change, and an increased supply of health care providers.²⁾

However, emphasis on these objectives has waned not because the goal of equal access has been fully met, but because the costs of personal health services have been growing disproportionately to the remainder of the economy. Health care costs accounted for 10.9 percent of gross national product in 1986 compared to 5.3 percent in 1960.³⁾

The major thrust of health services research today is cost containment without negatively affecting health status. To contain health care expenditures, utilization must be reduced or reallocated to less costly care. For instance,

health maintenance organizations (HMOs) and other prepaid health care plans emphasize preventive and ambulatory care, and want to maximize use of nonphysician personnel for effective utilization of resources.⁴⁾ As readily accessible nonphysician personnel, effective use of pharmacists, who are specialized in the drug use, is expected to contribute on developing the ideal health care delivery system including cost-effectiveness, access, and quality of care.

Despite the importance of the role of pharmacists, a recent survey⁵⁾ showed that only 13% of the "customers" asked medically-related questions to pharmacists in community pharmacies in the U.S. This limited utilization of pharmacist knowledge and expertise is not a universal phenomenon. In the study on the role of pharmacists in the Mexican health care system, Logan(1983)⁶⁾ showed that pharmacists were the most widely used medical option among the informants in her sample, with 41.7% stating that they consulted a pharmacist at least once a month. The 89.6 % of informants using pharmacists were spread throughout the sample. Logan discussed the drug regulation in Mexico, where few medications require a prescription to be sold and, in addition, it is common practice to be

1) Roemer(1977).

2) Darling(1986).

3) Gibson, et al(1987).

4) Gabel, et al(1987).

5) Selya(1988).

6) Logan(1983).

able to purchase prescription only drugs without a prescription. She suggested that the cultural-legal context in which pharmacists function allows them to flourish as primary health care providers.

In terms of drug regulation, Korea also shows big difference from the U.S. In the U.S., drugs are classified as OTC drugs or prescription drugs, and OTC drugs are directly available to the consumers. The law allows OTC drugs to be sold in any outlet. Thus such items are found in food stores, discount houses, and gas stations as well as pharmacies. In Korea, however, there is no formal drug classification. All drugs except narcotics are available at pharmacies without a prescription, but they are placed behind the counter and sold upon request. Even if people just want to purchase drugs for self-treatment based on past experience, they must ask a pharmacist or a clerk to get the drugs from behind the counter. In other words, there is no drug which is directly available to the consumers in Korea.

For a better understanding of the use of pharmacist advice, a comparative study was conducted between U.S. and Korea. The study had two research questions. The first question was whether the pattern of utilization of pharmacy services over the different levels of severity was different between two countries with different pharmaceutical care systems. Based on previous studies, it appears that

the need variable, perceived symptom severity, is the most powerful predictor in this question. Thus symptom severity was controlled to compare utilization of pharmacy services. The second question asked whether the "country" variable was a significant factor predicting the utilization of pharmacist advice controlling for the key variables in the Andersen's model(1968).

II. Conceptual Framework

The health care utilization process is more than a biological symptom response. All care seeking behavior is carried out in a framework that is intensely affected by the social, cultural and political environment, regardless of the type or severity of the pathologic process. A multiplicity of factors associated with utilization of health services has been found, and was formalized in Andersen's behavioral model(1968). Thus the conceptual framework that guides this study is Andersen's model, which relates an individual's decision to use health care services to predisposing, enabling, and need components.⁷⁾

From the point of view of health policy and planning, these factors are very important, because an ability to provide accessible and cost effective services to patients depends

7) Andersen(1968).

on a thorough understanding of factors associated with the use of health services.

Planners and policy analysts can influence political variables, like drug regulation policy, whereas providers and administrators are more likely to influence organization factors (mechanisms for entry and movement through the system). The demographic and social structural variables (e.g., education, social class, ethnicity, and race) cannot be directly influenced. Rather, these factors represent target group variables that aid the identification of subgroups in the population that have limitations in access to health services. Such factors as values, attitudes, norms, and culture are difficult to change in the short run but may be influenced eventually through health education and related efforts.

The purpose of the study is to investigate the use of pharmacist advice. Therefore, it is expected that besides a theoretical contribution, from the macro perspective this study will also provide utilization data needed to explore the effectiveness of alternative means of providing pharmacy care for health policy analysts and researchers.

III. Methodology

1. Design and Data Collection

The study investigated the use of pharmacist advice between two countries. Those who live

in different countries may have different perceptions and be surrounded by a different environment. Thus university students were chosen as a study population because they provided fairly homogeneous characteristics in terms of demographic, socioeconomic, life-style, awareness, and knowledge variables. These group differences between the two countries were controlled to a certain extent, which resulted in a form of pre-experiment.⁸⁾ Furthermore, convenience and the low cost of running the study at university campuses were additional important factors guiding study site selection.

In the late September of 1989, two study (sub) populations were created using selected university students in both countries. In the U.S., the students who enrolled in either an "Educational Psychology and Measurement" or a "Principles of Social Psychology" class at the University of Iowa in Iowa city were asked to participate in the study, whereas those who enrolled in an "Introductory Sociology" class at the Seoul National University, Dan - Kook University, or Kuk - Min University in Seoul, were asked in Korea. All these classes are introductory courses for undergraduate students and open to any student in each university.

Data were collected by means of self-administered questionnaires in the classroom.

8) Campbell and Stanley(1966).

Students who were interested in the survey were asked to stay in the classroom after the class to fill the questionnaires. For the students who had time conflicts, extra sessions were provided. In the U.S., 165 students responded the survey, whereas 183 students did in Korea. The participation rate was 67%, and 82% from each country respectively.

2. Operationalization of Concepts and Measurement of Variables

1) Dependent Variables

Utilization, the dependent variable in Andersen's model, was measured as the number of days using one treatment action before another action is taken. It includes not only whether pharmacist advice was used, but also the extent to which it is used. In other words, utilization in this study means how long a person(hypothetically) depends on a specific treatment action.

The question format to measure the dependent variable was developed in this study. For given 18 symptoms, respondents were asked to imagine that they would have each of them for 7 days, and decide how they would act for that symptom each day. Five options were provided based on the research questions of the study: doctor use, pharmacist advice use, OTC drug use, other and doing nothing. The "other" option includes changing behavior, using home remedy, and lay consulta-

tion. To help interpret results, respondents were also asked to write down their preferred treatment, if any, for each symptom.

2) Independent Variables

Six key variables were selected as predisposing variables: age, sex, faith in doctors, faith in pharmacists, health professionals in the family, and country. To measure "faith in doctors" and "faith in pharmacists", two indexes were developed. Based on a review of the literature, three statements were chosen. The level of agreement for three statements was rated on a seven-point scale and summed up to develop an index. These indexes showed relatively good reliability ($.7040 \leq r \leq .8800$).⁹⁾

Eight variables were determined from the literature to be key factors of enabling components: 3 accessibility variables for pharmacy, 3 for doctor's offices, and 2 regular sources of care variables. Three characteristics of the pharmacy and doctor's office regarding access were selected from the literature: location, waiting time, and office hours.¹⁰⁾¹¹⁾ Penchansky and Thomas (1984) showed the relationship between satisfaction with access and utilization of services. Thus satisfaction for these traditional access measures was rated on a seven-point Likert scale.

9) Carmines, et al(1979).

10) Andersen, et al(1978).

11) Penchansky, et al(1984).

In this study, need was assessed by the perceived severity of a symptom on a seven-point scale where 1 is least severe and 7 is most severe. A list of 18 readily identifiable symptoms, of various degrees of severity, was compiled. The list was derived from a review of the literature dealing with similar problems.

IV. Results

1. Differences in the Use of Pharmacist Advice

The data were analyzed to investigate the differences in the use of pharmacist advice between the U.S. and Korea. To help interpret and easily manage the data, 18 symptoms were factor analyzed based on symptom severity. Four factors were extracted from the data.

The mean severity of one factor was significantly different from that of others for 4 factors ($p < .001$). Based on the mean severity of each factor, they were labeled as least severe, less severe, more severe, and most severe groups. As is shown in Table 1, the mean severity was different between the two countries for all four levels of symptom groups ($p < .001$).

Based on four symptom groups, a 2×4 repeated measures design was used to test the difference in the use of pharmacist advice between the two countries. The dependent

variable was the average number of days using pharmacist advice for a given symptom group. One aggregated value represented use tendency for the symptom group (use tendency index for "symptom group"). With the same reason, symptom sensitivity index for symptom group was developed by averaging the symptom severity of the symptom with the same level of severity.

Use of pharmacist advice has significant interaction effects with symptom groups. Utilization pattern for the 4 symptom groups was not consistent between the two countries (see Figure 1).

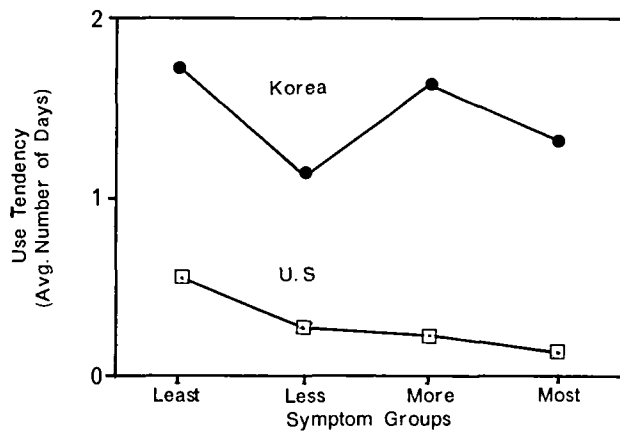
With significant interaction, simple effects were examined. To control the difference in severity, Analysis of Covariance (ANCOVA) was used as a way to test simple effects of the country variable. After controlling for the symptom sensitivity for symptom groups, significant differences in the use of pharmacist advice were found for the 4 levels of symptom groups.

In terms of pharmacist advice use, no matter how severe the symptoms were, U.S. students were apt to use it for fewer days than Koreans. Even though the relationship was very weak, the more severe the U.S. students perceived the symptoms to be, pharmacist advice was used less (0.64, 0.26, 0.23, and 0.18 from the least severe to most severe symptoms respectively) than Korean (1.64, 1.13, 1.61, and 0.24 accordingly). For less and more severe symptoms,

Table 1. Cross-National Comparison of Symptom Severity

Symptom Groups	Name of Symptoms	U.S. (mean)	Korea (mean)
Least Severe (Factor 1)	Dandruff	1.30	1.42
	Common cold	2.04	1.98
	Headache	2.80	3.10
	Rash or similar skin trouble	3.05	3.75
	Aching joint	2.60	4.43
	Upset stomach	2.82	4.57
	(Mean)	(2.44)	(3.21)
Less Severe (Factor 2)	Poor appetite	2.87	3.02
	Minor burns	3.02	3.33
	Trouble in sleeping	3.03	3.42
	Depression	4.46	3.47
	Dizziness	4.49	3.84
	(Mean)	(3.57)	(3.42)
More Severe (Factor 3)	Swollen glands in the throat	4.17	3.88
	Shortness of breath	4.70	4.45
	Pain in the chest	5.52	4.93
	(Mean)	(4.80)	(4.39)
Most Severe (Factor 4)	Difficulty in passing urine	5.62	5.12
	Bloody stool	6.11	5.29
	Lump in breast or other part of body	6.58	5.01
	Cough up blood	6.15	5.76
	(Mean)	(6.12)	(5.30)

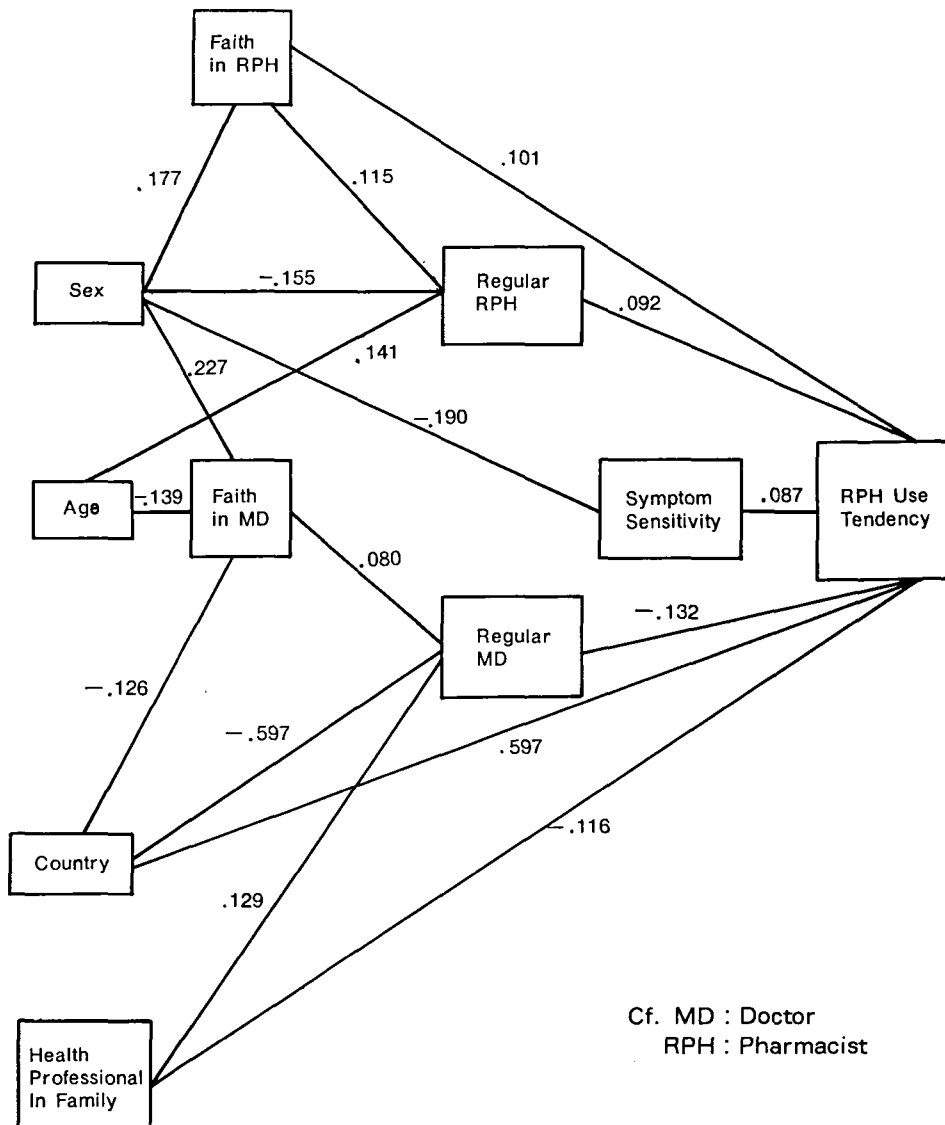
Figure 1. Differences in the Use of Pharmacist Advice with Adjusted Means after Controlling for Symptom Sensitivity



the pharmacist advice use for the U.S. students was not significantly different ($p=.76$). For all symptoms with various levels of symptom sensitivity, U.S. students were apt to use pharmacist advice for less than one day, which means many of them would not use it. For

Korean students, there was no relationship between the pharmacist advice use and symptom groups. They were apt to use advice for at least one day for all symptoms with various levels of symptom sensitivity.

Figure 2. Path Model for the Use of Pharmacist Advice (U.S. and Korea)



2. Factors Associated with Use of Pharmacist Advice

To test the importance of "country" variable in predicting use of pharmacist advice, regression analysis was conducted. The significance of change in R^2 was tested, when the "country" variable was entered into an equation that already contains the other 14 independent variables.

R^2 was 0.385 for the model without country variable, whereas for the full model with country, R^2 was 0.530. The change in R^2 was 0.146, and also statistically significant. The results supported that even if they had the same characteristics in terms of the rest predisposing, enabling, and need, the fact that they were living in a different country affected significantly the use of pharmacist advice.

The unstandardized regression coefficients (b) as indices of the effects of the variables with which they are associated were also calculated. The regression coefficients of country was 0.914, which means Korean students tended to use pharmacist advice more than U.S. students, controlling for other characteristics.

The Andersen's behavioral model was intended to investigate causal relationship among three stage variables: predisposing, enabling, and need. To specify and test the causal relationships, path analysis was conducted.

The revised model, including the significant path coefficients, is presented in Figure 2. The decomposition of total effects into their component direct and indirect effects is presented in Table 2. The model accounted for 53.0% of total variance in pharmacist advice use.

The strongest direct effect on pharmacist advice use was exerted by "country" ($p = -.59$), which means that the U.S. students tended to report "pharmacist advice use" for fewer days than Korean students. In addition "faith in pharmacists", "regular pharmacist", and "symptom sensitivity" exerted positive direct effects on "pharmacist advice use", whereas "regular doctor", and "health professional in family" exerted negative effects. In other words, if the students were more sensitive to symptoms, and/or had a regular source of pharmacist care, and/or a high faith in pharmacists, they tended to use pharmacist advice for more days. But if they had a "regular doctor", and/or had any family member in a health-related profession, they tended to use it less. Sex of the subject influenced pharmacist advice use through symptom sensitivity. Female students were more sensitive to symptoms, which led to more pharmacist advice use.

Several variables exerted indirect effects on pharmacist advice use via their direct effect on "regular pharmacist". "faith in pharmacists" and "age" was negatively

Table 2. Decomposition Table(U.S. and Korea)

Variables	Total Covariance (r)	Causal		
		Direct Effect	Indirect Effect	Total Effect
RPH Use				
Symp. sensitivity	.05	.08	.00	.08
Regular MD	-.50	-.13	.00	-.13
Regular RPH	.06	.09	.00	.09
Faith in RPH	.16	.10	.01	.11
Health Profession	-.16	-.12	-.02	-.14
Country	.69	.59	.09	.68
Symptom Sensitivity				
Sex	-.20	-.19	.00	-.19
Regular RPH				
Faith in RPH	.09	.12	.00	.12
Sex	-.13	-.16	.02	-.14
Age	.14	.14	.00	.14
Regular MD				
Faith in MD	.10	.08	.00	.08
Country	-.62	-.60	-.01	-.61
Health profession	.17	.13	.00	.13
Faith in RPH				
Sex	.17	.17	.00	.17
Faith in MD				
Sex	.19	.23	.00	.23
Age	-.12	-.14	.00	-.14
Country	-.04	-.13	.00	-.13

related. Those who had more faith in pharmacists and/or with older age, and female students were more likely to have a regular source of pharmacist care. Furthermore, the indirect effect of gender(sex) through "faith in pharmacists" on "regular pharmacist" was a positive effect, while the direct effect of gender(sex) on "regular pharmacist" was negative. These contradictory results were not explained by the data.

A set of variables also exerted indirect effects on "pharmacist advice use" via their direct effect on "regular doctor". "Faith in doctors" and "health professional in family" had a positive effect on "regular doctor", while "country" had negative effect. Those who had more "faith in doctors", and/or "health professional in family", and/or the U.S. students were more likely to have regular source of doctor care. The indirect effect of country through "faith in doctors" on "regular doctor" was negative, which means the U.S. students had more faith in doctors, which led to more regular source of doctor care for the U.S. students. This indirect effect was consistent with direct effect.

Sex also has indirect effect on "regular doctor" through "health professional in family". Male students are more likely to have a health professional in family, which lead to more regular source of doctor care. These results are consistent with the positive effect of sex on regular source of doctor care

through "faith in doctors".

Age exerted the indirect effect on "regular doctor" via "faith in doctors". Younger students tend to have more faith in doctors, which leads to more regular source of doctor care, which leads to less pharmacist advice use. This result was consistent with the age effect on pharmacist advice use via regular source of pharmacist care. Younger students were less likely to have a regular source of pharmacist care, which led to less pharmacist advice use.

V. Discussion

1. Summary

The first research question of this study was a comparison of the use of pharmacist advice between the U.S. and Korean students, controlling for symptom severity. The U.S. students were less likely to depend on pharmacist advice in response to symptoms, no matter how they perceived them.

The U.S. students reported that they would use pharmacist advice for less than one day, whereas the Korean students reported they would use pharmacist advice at least one day. This means that the U.S. students would not seek professional care from pharmacist for many symptoms. These results suggested that even though the pharmacy profession has made efforts to expand its role, the profess-

ional role has not been socially recognized in general.

The second research question was to test whether the use of pharmacist advice was systematically different between the U.S. and Korean students, when controlling for the characteristics for the rest of the predisposing, enabling, and need variables. After adjusting for differences in these variables, there were meaningful differences in the use of pharmacist advice between the U.S. and Korean university students.

The remaining effect of "country" which led to the difference can be interpreted in a variety of ways, as each country has its own social, economic, cultural, and political characteristics, distinguished from those of other countries. One possible factor might be the differences in the drug regulatory environment between the two countries.

Using a modified Andersen's model including 4 stages of components (pre - predisposing, post - predisposing, enabling, and need), the use of pharmacist advice for both U.S. and Korean students were successfully explained as was shown in Figure 2 (R^2 for pharmacist advice use was 0.530).

Although the need variable (symptom sensitivity) was found to be a significant factor in predicting pharmacist advice use, it did not have as much predictive power as it had for physician visits. One possible reason for that may be that "need" was measured

as a relative symptom sensitivity for the given symptoms by summing the 18 individual symptom severity.

With regard to enabling variables, "regular pharmacist" and "regular doctor" were significant predictors. While students were more satisfied with the accessibility of pharmacies (in terms of hours, travel time, and waiting time) than that of doctors, these factors were not significant predictors for "pharmacist advice use".

In sum, application of modified version of Andersen's model to the U.S. and Korean university students yielded very unique findings, where the most predictive power was in predisposing variables.

2. Limitations

While the present study did produce some interesting results, caution should be exercised in addressing them to a general population. Two populations were created to be as similar as possible for the purpose of comparison. Although the participants represented the populations in terms of sex and age, they did not represent the general population.

The most noticeable limitation was that the expected utilization was investigated for the given 18 hypothetical situations with various degrees of symptom severity. As young adults, the university students may not have

experienced all of these symptoms. Without experience with the symptoms, the results may show significant deviation from the actual utilization.

However, as a comparative study, these conditions were applied to both the U.S. and Korean university student, who were expected to be fairly homogeneous in terms of socio-economic, life style, awareness, and knowledge variable. In this regard, this limitation was not serious enough to invalidate the findings.

3. Policy Implications

This study showed the significant differences in the pharmacist advice use between the U.S and Korean students. Different drug regulatory environments were discussed as a possible factor for differences in the role of the pharmacist.

After the Durham-Humphrey Amendment, which created legal definition of a drug classification, pharmacists became dependent on the physician with some drugs. They were just regarded as distributors of the commodity drugs.¹²⁾ With the clinical pharmacy movement, however, the pharmacist is no longer totally constrained by the whims of the doctor. Today pharmacists can prescribe in some states. In Florida, all pharmacists are

allowed to prescribe a limited number of drugs, a third class of drugs, and they act independently of physicians.¹³⁾

On the contrary, any drugs can be obtained by walking into a pharmacy and buying it in Korea. But recently there has been tendencies trying to create a drug classification and to separate the pharmacy from the medicine.

As was shown in this study, drug regulation has an impact on the professional role of pharmacists. As readily accessible nonphysician personnels, effective use of pharmacists, who are specialized in the drug use, is expected to contribute on developing the ideal health care delivery system including cost-effectiveness, access and quality of care. Thus in the health care environment in which the role of pharmacist is emphasized, drug regulations need to be taken into account in the health care planning.

4. Future Research

One obvious study for the future is an extension of this research into the general public. The comparison of the use of pharmacist advice between the U.S. and Korea in general, will provide the generalizability in the interpretation of the study results.

The role of drug regulation as a predictor

12) Temin(1979).

13) Feinberg(1986).

of utilization of pharmacy services also warrants further exploration. Drug regulation, as one of the factors which represent a country, was speculated as a possible, important factor in predicting the utilization of pharmacy services. Rather than speculating the results, the importance of drug regulation can be directly investigated through international comparative study. By selection several countries with different drug regulation, the importance of drug regulation can be directly

investigated.

Another area requiring further study is the impact of the utilization of pharmacy services on other treatment actions. The impact of self care on the formal medical care has been discussed as substitute, supplement, or stimulus.¹⁴⁾ As an analogy of that, the utilization of pharmacy services can be discussed in relation to other health options. In this context, the dynamics of illness behavior is worthy of study.

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