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SECONDARY PREVENTION HEALTH BEHAVIOR ON CERVICAL CANCER IN KOREA: PAPANICOLAOU SMEAR SCREENING TEST

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PUBLIC HEALTH

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DEDICATION

This dissertation is dedicated to

my beloved younger sister

Yeon Hee Kim

in memory of her everyday demeanor

which was so full of life (1961-1993).

ACKNOWLEDGMENTS

I would like to express my appreciation from the bottom of my soul to everyone who helped me to reach this point:

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And my special thanks to my parents, my sisters and brother, particularly to my beloved younger sister who is watching me from the holy heaven, who gave themselves without any hesitation, and made it all possible.

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My sincere Mahalo to all of you!

ABSTRACT

The purpose of this explanatory study was to provide baseline information on the secondary prevention health behavior of cervical cancer in Korea which was related to the utilization of the Papanicolaou (Pap) smear screening test.

Two steps were undertaken for this study. First, secondary data from the 1992 Korean Health Behavior Survey (KHBS) was used for analysis in order to determine sociodemographic profiles and the predictor variables. The sample analyzed for this study contained 1,489 Korean women residing in Korea aged 20-59 selected by a systematic sampling method from the 1990 Korean census. Second, the same 1992 KHBS sample was used in a follow-up study in 1995 with an additional quest concerning barrier factors of Pap test utilization. Of the original sample who could still be traced only 424 women responded.

Bivariate and logistic regression analysis were performed to produce the findings of this study. Only 27.9% of the study sample had had a Pap test in 1992, while 36.0% of them had taken the test in 1995. It was found that the relative sociodemographic profiles of the Pap test between users and non-users, and among the three history groups (never, suspended, regular groups) were distinctive in both 1992 and 1995 follow-up studies. Due to small sample size

in 1995, the significant independent sociodemographic variables were fewer than those found in 1992. The predictor variables were age, marital status, educational status, usual source of care, perceived household economic status, health check-up, and presence of chronic disease in 1992, while marital status, usual source of care, and health check-up were the predictors in 1995. With respect to women's lifetime experience of the Pap test, age, marital status, health check-up, and source of health knowledge were predictors. With respect to both suspended and regular uses of the Pap test, however, health check-up was the only predictor. For barrier factors of Pap test utilization, physician factor and policy factor were found as barriers to initiate the test, while personal factor was a barrier for discontinuation of the Pap test and also for being regular Pap users in Korea.

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CHAPTER 1

INTRODUCTION

The Papanicolaou (Pap) smear test is the only proven, currently available cost-effective mass screening technology, employed worldwide for the detection of cervical cancer (Baquet et al., 1987; Ciatto et al., 1991; Dewar et al., 1992; Eddy, 1990; Miller, 1992; Solomon, 1993). As this test is a key element in the reduction of mortality and incidence rates for cervical cancer, its underuse is directly related to increased rates of cervical cancer mortality and incidence (Baquet et al., 1987; Boyes, 1981; Dewar et al., 1992; Duelberg, 1992; Eddy, 1990; Hakama et al., 1976; Herrero et al., 1992; Lerman et al., 1990; Mamon et al., 1990; Perucci et al., 1990; Ronco et al., 1991; Solomon, 1993).

Problem and the Background

Although cervical cancer is the most common female malignancy in Korea (Ministry of Health and Social Affairs, 1993), in 1989 only 17% of Korean women aged 20-59 had been screened with Pap smear test (Song et al., 1990). This remarkable finding by the Korea Institute for Health and

Social Affairs was revealed in the results of the first nationwide Korean Health Behavior Survey (KHBS), conducted in 1989.

In Korea, the Pap smear screening test was first implemented in 1957 by a few university medical centers (Kim et al., 1988). The Korean government followed up with a mass screening demonstration project in 1968, which they conducted over a three and half year period. Although the Pap test, including necessary facilities and the personnel, has been available since then, the data on its effectiveness are still not available. Moreover, data on the prevalence rate of the Pap smear test, with its general applicability are also not obtainable at present, except for the data from the KHBS in 1989.

Mortality and Incidence Rates of Cervical Cancer in Korea

Indeed, it is obvious that information on cancer incidence and mortality and their trends over time is an essential component for every cancer control program involving cancer prevention, early detection, and treatment. Nonetheless, only a few epidemiological studies of cervical cancer mortality and incidence have been conducted in Korea.

The estimated mortality rate of cervical cancer in 1989 was 7.7 per 100,000 persons, making it the third highest

female cancer mortality rate (National Bureau of Statistics, 1990). It indicates a much higher rate compared with other neighbor countries according to a report from the World Health Organization. The age-adjusted death rates per 100,000 persons were 3.2 persons in China in 1990, 1.8 persons in Japan during 1990-1993, and 6.1 persons in Singapore during 1990-1992 (Parker et al., 1996).

Of all registered female cancer cases during the period between July 1991 to June 1992, cervical cancer had the highest frequency (27.8%) (Ministry of Health and Social Affairs, 1993). Data available from the same source also showed an increasing trend during the period of 1982 to 1987 ranking first.

These data, however, did not come from a population-based cancer registry, but rather from nation-wide hospital-based cancer registries established by the Korean Ministry of Health and Social Affairs (1993).

Although the cause of death based on vital statistics has been published by the national government since 1982, it covers fewer than 50% of deaths (Kim I-S, 1989; Kim J-S, 1989; Yoo et al., 1992; Lee et al., 1992). Hence, these data were not utilized in this paper.

A research project, representative of the insured Korean population, was carried out on data from Korean Medical Insurance Corporation (KMIC). These research data identified trends in mortality and morbidity of cervical

cancer during the ten-year study period of 1981-1990 (Yoo et al., 1992). The study reported that the age-standardized mortality for cervical cancer had been increasing during the study period from 1981-1989 (0.31 per 100,000 in 1981 to 1.57 per 100,000 in 1989). The age-standardized admission rate for this cancer also showed an escalating trend during the same period (20.57 per 100,000 in 1981 to 48.64 per 100,000 in 1989). Yet, the reasons for these increasing trends are inconclusive. They might be due to increasing ascertainments of cervical cancer during the study period or actual increases. The rate began decreasing in both the mortality and the admission rates of this cancer in 1989. However, rates in 1990 (a mortality of 1.41 per 100,000 and an admission rate of 40.09 per 100,000) were still much higher than the rates in 1981 (about five times higher for the mortality rate and two times higher for the admission rate). Although these decreasing trends may reflect an actual decrease in the incidence of advanced stages of the cancer, it is unknown whether the trends are associated with the growing utilization of the Pap smear screening test. Nonetheless, data from this source would be reliable, as it was 1989 when universal insurance coverage was achieved in Korea. Since that time, the KMIC data cover approximately 10% of the total Korean population (KMIC, 1993; Yoo et al., 1992).

The rate of hysterectomies was believed to have a possible effect on the trends of cervical cancer (Seow et al., 1992). Hysterectomies alone may account for a possible 6-10% decline in the mortality among women, particularly those over 55 years of age (Anderson et al., 1978; Van der Graaf et al., 1988). Data on the rate of hysterectomies in Korea are not readily available at present for use in the determination of its impact on the mortality due to cervical cancer.

Characteristic of nearly all of the other studies was the absence of a representative sample. For example, two Korean studies on cancer mortality with reliable methodologies (Chung, 1992; Lee, M-S, 1992) were not used in this study due to the regional bias of the samples. The study results for the mortality of cervical cancer (3.3 per 100,000 persons ranking 5th in the Kyongsangnam-do area and 8.2 per 100,000 persons ranking 3rd in the Kyongsangpook-do area) showed significant differences with those of the National Bureau of Statistics (7.7 per 100,000 persons ranking 3rd). Therefore, most of the studies on cervical cancer mortality and incidence performed in Korea cannot be generalized to the entire population. However, the problems with generalization were not related to classification, which used the 'International Classification of Disease' codes presented by the World Health Organization (Ministry of Health and Social Affairs, 1993).

Despite the fact that the mortality reported among many of the Korean studies varies according to materials and methods, there is a consensus about one aspect of cervical cancer. The data from all studies conducted in Korea show that cervical cancer is the leading type of cancer among Korean women (Boo et al., 1992; Lee, 1993; Lee et al., 1993; Park et al., 1992) and the mortality ranks and incidence rates are remarkably high (ranking 2nd to 5th for mortality; 1st for incidence).

Therefore, for the reasons stated above, cervical cancer must be regarded as a major health problem which should be given high priority for study, health policy, and investment in Korea.

Status of the Early Detection of Cervical Cancer in Korea

The Pap test, a secondary screening measure for the early detection cervical cancer which if properly administered, will detect precancerous lesions of the cervix. Cervical cancer progresses through five clinical stages from 0 to IV. When it is detected and diagnosed in the preinvasive status, such as intraepithelial neoplasia and carcinoma in situ, clinical stage 0, the survival rate is nearly 100% (Davis, 1991; Mandelblatt et al., 1991; Cha et al., 1992).

A national survey, which collected data from 23 hospitals that are members of the Korean Association of Obstetricians & Gynecologists, found that 78% of all cervical cancers were detected by the Pap smear test (Shin et al, 1989).

However, few statistics have been provided on the five-year survival rate of patients diagnosed with cervical cancer in Korea. Most of the previous Korean studies on this issue used records from one hospital, so that the outcomes are not representative of the entire female Korean population. One study conducted by researchers from the Seoul National University Hospital from 1959 to 1978 followed women for a minimum of five years through the outpatient department and home visits. The outcome showed a five-year cervical cancer survival rate of 90.6% for stage I, 75% for stage II, 26.3% for stage III, and 0% for stage IV (Shin et al., 1989). These results were supported by a recent study (Lee et al., 1993) which evaluated cancer patients treated in the same hospital from 1977 to 1982 using life table analysis. The five-year survival rates ranged from 100% to 80.8% for stage I, 74.5% to 66.8% for stage II, 51.9% for stage III, and 27.8% for stage IV. These data clearly demonstrate the critical role that the Pap smear test can play in the early detection of cervical cancer.

Unfortunately, the majority of Korean studies reported detection of higher percentages of stage II cervical cancer than stage I (Chang et al., 1982; Lee H-P et al., 1993). This indicates that the Pap test has not been fully utilized for the early detection of cervical cancer in Korea. However, Lee's study (1993), using data for the most recent three years (1990-1992), obtained from obstetrics and gynecology resident training hospital-based cancer registries, revealed substantially different findings. This study found 42.4% for stage I, 39.2% for stage II, 11.2% for stage III, and 3.8% for stage IV among women with an abnormal Pap smear. The yearly distributions by the stages during the three years of the study period were similar. Yet, there is no evidence that the outcomes of Lee's study were result of the present increase in the use of Pap smear screening tests.

While these studies were hospital specific so that the findings cannot be generalized, they at least suggest the important role of the Pap test in early diagnosis, leading to the early treatment of cervical cancer for Korean women.

Status of Readiness for Cervical Cancer Control in Korea: Fundamental Information

In order to achieve successful control of cervical cancer, which has already been identified as a public health problem, an optimum amount of fundamental information is prerequisite for a systematic approach. Information, such as the prevalence of Pap smear testing, the demographic profile of the tested and untested populations, and factors associated with prevention behavior, is critical for sound secondary prevention health behavior. This information could be of great importance in cancer control programs and help in the development of successful control strategies.

At present, there are few base line data gets available in Korea. Since a nationwide cervical cancer screening program is not presently provided in Korea, useful data for the purpose of national cancer control have not yet been generated.

Some studies carried out in these areas failed to present practical information for Korean women in general due to a serious problem of generalizability and dubious content validity (Kim S-D, 1988; Lee, 1982; Lee, 1984; Park S-M, 1984; Shim, 1986; Synn, 1977). For instance, a common problem was the sampling methodology using convenience samples, which were not representative, such as restricted samples from a few selected areas within urban or rural

areas, mothers of school children in a few selected schools, some rural wives in a university project area, and outpatients in a few hospital gynecology departments. None of the questionnaires used in the above studies were tested for reliability or validity. Because of this, many of the researchers questioned the representativeness of their studies.

Although the demographic profiles and utilization rates of the Pap test among Korean women were generated by health prevention projects conducted by health insurance companies, they were also derived from particular groups of women; namely the insured and their dependents. Furthermore, the targets of the projects were of a limited number and age group (over 35 or over 40) (Health Insurance Union, 1992; KMIC, 1992; 1993).

On the other hand, there is a remarkable degree of similarity between many studies in the nature of the data and methods employed to collect demographic information. They have a distinctive pattern, that is, one of utilizing knowledge, attitude, and practice (KAP) investigation (Choo, 1988; Kim, 1992; Kim et al., 1988; Synn, 1977; Shin et al., 1993).

Significance of the Study

There is no known single causal factor that can be regarded as a necessary aetiologic agent for the causation of cervical cancer (Baquet et al., 1987; Herrington, 1995; Miller, 1992). Some specific human papilloma viruses (HPV) are recently documented as the primary causal agent for this cancer (Birley, 1995; Herrington, 1995; Liaw et al., 1995; Schiffman, 1995; Walboomers et al., 1995). Nevertheless, it still can not be consistantly proven that all cases of the cancer are associated with HPV infection, even oncogenic types (Birley, 1995; Bornstein et al., 1995; Fowler, 1993; Herrington, 1995; Liaw et al., 1995; Walboomers et al., 1995). Other risk factors, such as sexually associated factors of women and their partners, smoking, dietary deficiencies such as vitamin C, carotenoids, and folic acid, hormonal effects, immunosuppression, and occupational hazards of male partners, would play as additional risk factors of this cancer (Birley, 1995; Bornstein et al., 1995; Herrington, 1995). Thus, knowledge related to the risk factors for cervical cancer does not seem to reduce the mortality and incidence rates effectively. In addition, the majority of cervical cancer patients in the early stages of the disease are asymptomatic (Lee, 1992; Park, 1992). Moreover, diagnosis and treatment in an early clinical stage achieves nearly 100% survival. Therefore, never having had

a Pap smear screening test was indicated as the most important risk factor for cervical cancer by numerous studies (Liaw et al., 1995; Herrero et al., 1990; Ronco et al., 1991). Consequently, in order to achieve maximum prevention of cervical cancer mortality and morbidity, the utilization of the fully accepted Pap smear screening test, by the target population, is vital.

Surprisingly, in Korea, despite the universal availability of the Pap test, the utilization ranges from only 17% to 21.6% (Kim, 1984; KMIC, 1992; Lee T-H, 1984; Song et al., 1990; Synn, 1977). Nevertheless, there has not been generally applicable documentation to the Korean female population on the fundamental data for cervical cancer control.

The significance of this study is that a population based study in Korea can provide answers to the urgent and crucial issues involved with cervical cancer control. It could produce a framework for a workable plan which may increase participation in Pap smear screening up to, ideally, the complete prevention of the cancer in Korea with limited financial resources.

Statement of the Problem

The problem to be addressed in this study are factors surrounding the under-utilization of the Pap smear screening test among Korean women.

Purpose of the Study

The purpose of the study is to 1) provide a descriptive demographic profile of Korean women residing in Korea in relation to Pap smear screening test utilization; 2) identify sociodemographic variables that predict the Pap smear screening test utilization of target and priority groups of potential screening; and 3) verify comprehensive factors associated with barriers to the use of the Pap smear screening test in Korea.

Structure of the Study

Interest in the area of this dissertation was stimulated by the low Pap test utilization rate reported in 1990 by the first nationwide KHBS. The first KHBS study, which was conducted in 1989, originated as a result of political concern for disease prevention and health

promotion. Its established goal was to determine major health problems and to gather information to be used for the design and evaluation of effective health education programs. In addition, the KHBS project was planned to be replicated on a regular basis every three years.

This dissertation utilized two different data sets collected at the different times shown in Figure 1. The first data set consisted of secondary data collected in 1992 by the second KHBS. The second data set consisted of a follow-up of the same subjects of the second KHBS conducted by this researcher in 1995 for the purpose of comparison to the second 1992 KHBS data. The Pap screening test rate, the demographic profiles, and the predictable variables of the potential screening were compared between the two data sets.

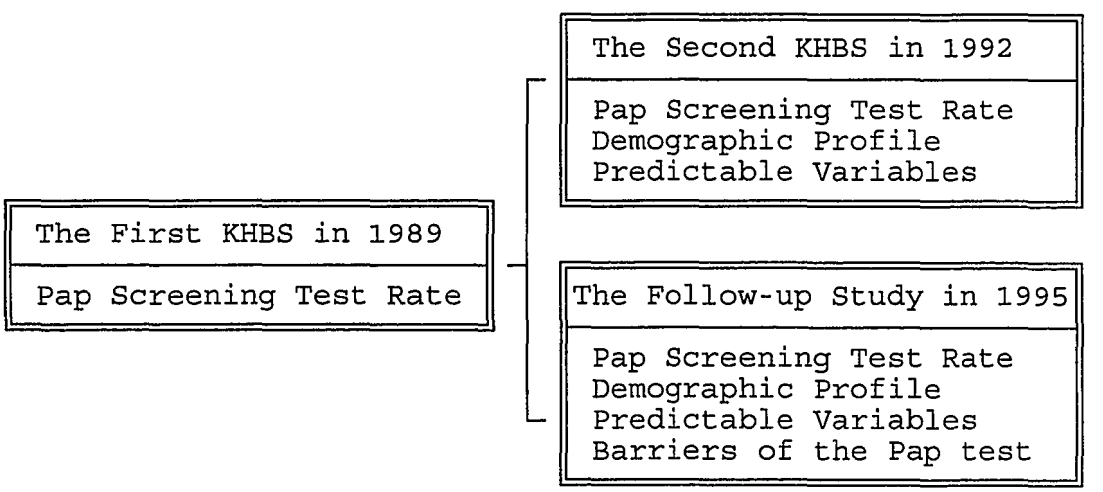


Figure 1. Structure of the Study

Moreover, data collected in 1995 additionally inquired into barriers to the utilization of the Pap smear screening test in Korea.

Research Questions

The research questions for the study were as follows:

1) What are the sociodemographic profiles of Korean women residing in Korea according to their Pap smear test history?

1.1) What are the differences upon the sociodemographic profiles of Korean women between those who had had a Pap smear test and those who had not in the 1992 KHBS study and in the 1995 follow-up study?

1.2) What are the differences upon sociodemographic profiles of Korean women among the following three groups: those who had never had a Pap test, those who had suspended use of a Pap test after one or more participations, and those women who had had regular Pap tests in the 1995 study?

1.3) Is there a different trend in the prevalence of the Pap smear utilization according to time, from 1989 to 1995?

2) What are the sociodemographic variables that predict the usage of the Pap smear screening test in the 1992 study and in the 1995 study?

3) What factors are associated with the barriers to Pap smear test utilization in Korea?

Summary of the Chapter

Chapter 1 provided an overview of this study. The chapter identified the significance of cervical cancer as a public health problem among Korean women residing in Korea and its background. The purpose of this study and the research questions were also addressed.

CHAPTER 2

REVIEW OF THE LITERATURE

There have been many studies on the screening of cervical cancer by means of the Pap smear test. However, the majority of the studies were not conducted with the views of health promotion but of epidemiology, medicine, and health education. Yet, several practical arguments have been presented to achieve maximum efficiency and effectiveness in the screening for the reduction of the incidence of and mortality related to cervical cancer.

The central issues to be discussed in this chapter are with regard to the selection of an appropriate population, the Pap screening guidelines, the Pap screening test rate, the predictable sociodemographic variables of women at risk on the utilization of the cervical cancer screening, and the factors associated with underutilization.

Population Based Screening and Targeted Screening

One of the most recognized components in this disease control was the adoption of the most appropriate policy on the target population. Two representative arguments have addressed this concern.

One of the arguments stated that optimal control for cervical cancer was achieved only when the entire female population of the recommended age for the Pap smear test was included in the screening program. When coverage rates of 70-80% of the entire population were achieved on a systematic basis, it was possible to see a tangible decrease in overall mortality and incidence rate (Hakama et al., 1985; Laara et al., 1987). In the experiences of Nordic countries such as Iceland, Finland, and Sweden, which have used this blanket screening strategy, 46-70% of the reduction in overall world adjusted incidence rate and 32-62% of reduction in overall world adjusted mortality rate (from 1966-1970 to 1981-1985) were reported (Sigurdsson, 1993). However, the protective effect with the targeted age group at the population level seems more effective. The statistics from a model country such as Iceland, having the most intensive and successful organized blanket screening program among the Nordic countries, showed that mortality decreased by 80% in women 30-39 years from 1965 to 1982, and the incidence rate fell by 30-60% between 1965 and 1975 (Laara et al., 1987).

Another controversial argument pertained to a targeted approach to women at risk for early detection of cervical cancer. It was regarded as the most practical strategy, which every country, including developing nations, could afford to conduct, in order to generate the maximum impact

of the Pap screening program with limited financial resources. The majority of the studies, particularly those performed in the U.S., called for the use of screening programs only for special at risk groups (BRFSS Coordinators, 1989; Harlan et al., 1991; Calle et al., 1993). With this strategy, the death rate of cervical cancer in the United States has declined over 70% for four decades (Solomon, 1993; U.S. Preventive Services Task Force, 1989). Particularly, during the period of 1973-1985, the decreases of 35% of the age-adjusted incidence rates and 38% of the death rates due to cervical cancer were occurred (Makuc et al., 1989). Nonetheless, convincing empirical data to prove the efficacy of this strategy were not available.

Miller (1992) argued that women at low risk of cervical cancer in a population were more likely to be screened than those at high risk. He also presented managerial guidelines for meeting successful and cost-beneficial outcomes for screening programs for cervical cancer. The listed requirements included a well-organized plan, adequate facilities and resources, and coverage for a full range of age groups of women at high risk for cervical cancer.

Pap Smear Screening Guidelines

Several guidelines exist for administering the Pap smear test. The guidelines regarding the ages to begin and discontinue the test and the screening frequency vary according to programs and organizations. Not only have they changed from organization to organization but they have changed within the same organization. An example is the change in the Pap smear test administration recommendations of the American Cancer Society (ACS) from 1980 (beginning at age 20 or with the onset of sexual activity if earlier and discontinuing by the age of 65 with three-year intervals after two annual negative smears) to 1987 (beginning with the onset of sexual activity with less frequent tests recommended by the women's physician after three negative Pap tests).

A consensus regarding the age at which to begin administering the Pap test exists. It was determined to be at the onset of sexual activity regardless of the beginning age recommended by the different organizations for the screening (Fink, 1988; Hamblin et al., 1995; Mahoney, 1992; Miller et al., 1991; MMWR Editor, 1989; Spurlock et al., 1992; Volkers, 1992). The recommendation of the ACS in 1980 was re-examined by its National Board of Directors meeting in 1987. Then, the new recommendation of the ACS was stated and it became in concordance with the other recommendations

previously developed by other health professional organizations. Those were the National Institutes of Health Consensus Development Conference in 1980, the American College of Obstetricians and Gynecologists in 1980, the Canadian Task Force in 1982, and the National Cancer Institute in 1983 (Baquet et al., 1987; Fink, 1988; Weisman et al., 1986). Despite the European Community (EC) recommendation which centers only on age to initiate the screening (all women at age 25), many EC countries practically use individual guidelines principally based on the onset of sexual activity (Coleman et al., 1993).

The issue over the age at which to discontinue the Pap test was a controversial one. One recommendation was that the Pap test was no longer necessary after reaching a certain age such as the age of 60 or 65 or 69 (American Cancer Society, 1980; Coleman et al., 1993; Davis, 1991; Miller et al., 1991). However, the idea of discontinuance in the elderly was strongly disagreed with by practicing physicians (Makuc et al., 1989; Weisman et al., 1986). Another was that annual tests ought to be administered over the lifetimes of women of all ages (Davis, 1991; Eddy, 1990; Volkers, 1992) as nearly one half of cervical cancer deaths occurred in women aged 65 years and older (Mandelblatt et al., 1991). Some of the most recent recommendations, however, were conditional (American College of Obstetricians and Gynecologists, 1995; Dewar et al., 1992; Eddy, 1990;

Miller et al., 1991; U.S. Preventive Services Task Force, 1989). They allowed that the screening could be terminated if the screening results were consistently normal by the suggested age to end the screening. Otherwise, the discontinuation of the cervical cancer screening should rely upon each individuals history as a significant percentage of elderly women have never been screened (Eddy, 1990; Hamblin et al., 1995).

The working guidelines for the frequency and the interval of the test were part of the most controversial debates and resulted in several recommendations. Basically all recommendations in the United States fell into three different categories. The first one was the annual test (Volkers, 1992). The second recommendation was that after two or three consecutive years of negative examinations, a less frequent test might be recommended at the discretion of the physician (American Cancer Society, 1988; Baquet et al., 1987; Dewar et al., 1992; Harlan et al., 1991; Volkers, 1992) or on the basis of every one to three year intervals (American Cancer Society, 1980; Baquet et al., 1987). The last guideline was an annual test for women between the ages of 18-35 and thereafter an exam every 5 years (Walton, 1982). The Canadian recommendation suggests two normal annual Pap smear tests and rescreened every 3 years until age 70 (Miller et al., 1991), while the EC advice was having 3-5 yearly screenings depending on the resources available

(Coleman et al., 1993). For Korean women, Lee, H-P (1992) suggested at least an annual Pap smear test with the ideal situation being a test every six months for all women after the onset of sexual activity. A recommendation policy on the Pap smear test in medical center of Catholic University Medical College in Korea was the annual test if the result was class I after three consecutive tests with every six month interval in women aged 65 years below (Boo et al., 1992). As a result, many Korean studies adopted the every 6 months Pap screening for their measurement (Synn, 1977; Choo, 1988).

However, considering the cost-benefit of the Pap screening test, infrequent screening with high coverage of the population at risk was urged (Coleman et al., 1993; Miller, 1992). The recommended cost-effective frequency was screening every 5 years, and less frequently than every 3 years was considered as cost-ineffective strategy.

Sociodemographic Characteristics of Women at Risk on the Utilization of the Cervical Cancer

Mullen et al. (1987) reported that sociodemographic characteristics were important predictors of health behavior. However, in spite of the many studies investigating the high risk groups for cervical cancer

screening, it was difficult to find commonly identified factors among sociodemographic characteristics in the literature.

Many limitations in the studies made the results inconclusive. Among those were: 1)different independent variables; 2)difference in categorization of the same variables; 3)different screening intervals for measuring (past year; two years; three and a half years); and 4)different definitions of terms or variables and so on. For instance, older aged women were at risk in both the study of Calle et al. (1993) using data from a nationwide survey of U.S. women (National Health Interview Survey Cancer Control Supplement in 1987) and that of Sprulock et al. (1992) using data from a population-based women's health survey in southeastern Kentucky in 1986. Their age categories were not compatible, and also the concept of 'older' was quite different (65+ Vs. 45+). In Korea, moreover, convenience samples such as married women, those in the 30-40 generation, and selected subjects from a Myon for a demonstration project (Myon is the second smallest administration unit in rural areas in Korea) was used. The sample of the nation-wide KHBS in 1989 involved Korean women only in the 20-59 age group.

Age. Within these limitations due to data incomparability, the age variable has been indicated the most frequently as a strong predictor of underuse of the Pap

smear screening. Miller (1992) regarded age as the most important risk factor for determining the priority group for Pap smear screening. Harlan et al. (1991) found that Pap smear screening was associated with age in an inverted U-shape. In addition, a majority of the studies conducted in the U.S. concluded that older women were more likely to be at higher risk than younger women in both 'never having had Pap smear' and 'not having had a recent Pap smear' (Calle et al., 1993; MMWR Editor, 1989; Sawyer et al., 1990; Spurlock et al., 1992). However, studies with the Korean sample yielded contradictory results. Kim, S-D (1988) and Lee et al. (1986) reported younger women had the lowest rate for screening while Synn (1977) showed women aged over 50 at the highest rate.

Marital status. Never-married women were found to be at higher risk than married women on the Pap smear screening test (Calle et al, 1993; Harlan et al., 1991). Others such as widowed or divorced women were at higher risk than married women in Kim S-D's research (1988) in Korea which did not include never-married women (Kim S-D, 1988).

Educational status. Less educated women tended to be at higher risk of not having Pap screening test than more educated women (Choo, 1988; Harlan et al., 1991; Kim S-D, 1988). In the U.S. sample, women, particularly those with fewer than 12 years of education, were at higher risk than others (Calle et al., 1993; Harlan et al., 1991). A study

by Sawyer et al. (1990) found this factor was not significantly related to having had a recent Pap test.

Household economic status. Kim S-D (1988) did not find self-perceived household economic status as a predictor variable in his regression analysis. Similarly, actual income status was not significant factor in Sawyer et al.'s (1990) bivariate analysis. However, one study, which focused on poverty levels, reported that women in below poverty levels were less likely to have the Pap screening test than women in above poverty levels (Calle et al., 1993).

Health insurance status. Kirkman-Liff and his colleague (1992) presented a significant difference based upon insurance status. According to them, uninsured women were far less likely to have had the Pap smear test than women with insurance (Choo, 1988; Kirkman-Liff et al., 1992). On the contrary, health insurance was not related to the Pap test in Sawyer et al.'s study (1990). Since Pap test has not commonly been covered by health insurance, it was anticipated result for the researchers. Studies carried on in Korea supported the Sawyer et al.'s finding of nonsignificant association by insurance status (Kim S-D, 1988; Lee et al., 1986).

Usual source of care. Source of care was indicated as an important variable to predict having the Pap test (Harlan et al., 1991; Kirkman-Liff et al., 1992). Women in the

category "no source of care" showed a tendency of being non-compliant with receiving Pap test screening.

Religion. Although religion was not frequently used variable in relation to the Pap smear utilization behavior, Korean studies did not found the significant association between religion and behavior (Kim, 1992; Kim S-D, 1988).

Employment status. In Cockburn et al.' study (1992), the association between the employment status and an up-to-date screening history was significant among Australian women aged 40 to 70. The corresponding result was reported by Choo (1988) in Korean sample, particularly on the occupation of professional administrators and school teachers, while there was no association in Kim's study (1992). Regarding never having been screened, unemployment status was weekly associated to Pap test utilization (Calle et al., 1993).

Health status. Women, who believe that healthy women do not need to have a Pap test, were strongly associated with overdue the test (Cockburn et al., 1992). Those believers tended to be overdue the test six times more than those who did not.

Health check-up. Attention on this variable was not given by researchers. A korean study explored the association between regular health check-ups and having a Pap test showed no significance (Kim S-D, 1988).

Source of health knowledge. Among Korean women, those who have been exposed to the mass media were more likely to have had the Pap test than those who were not (Choi, 1990; Kim S-D, 1988). Social network was not a variable which could predict the use of Pap test (Kang et al., 1994).

Factors Associated with Low Utilization on the Pap Smear Screening Test: The Barriers

Since the Pap smear test was introduced worldwide in the 1940s, there have been a significant number of cervical cancer screening programs which are using the screening test in both developed and developing countries. Yet, many studies have still reported and are seriously concerned about low utilization of the screening test against their countries' long-term efforts to control the cancer. Despite these circumstances, actually applicable outcomes have not been revealed through community based investigations, that is covering the gamut on the issue.

The existing studies have focussed on investigating one or more segments of the theoretically associated factors such as physician factor, psychological factor, and knowledge factor. Difficulty of comparability across the studies, as Orbell et al. (1993) demonstrated by reanalyzing data from 10 different studies conducted in some European

countries, was remarkable. Different studies adopted different factors, categories and codings as well as different methods. For instance, similar content such as embarrassment or painfulness of the test was classified into belief factor (King, 1987) or psychological factor (Orbell et al., 1993), or emotional factor (fear) (Peters et al., 1989). Others consisted of just one question with no category. Similar questions with categorical variables had incomparable codings. Some studies used a scoring method with the Likert scale (Choo, 1988) while others were counted by the number of barriers (Sawyer et al., 1990). It has been shown that a significant number of studies have used undefined or poorly defined factors and criteria, and vague questions. Even though many of those studies had too small a sample size to yield generalisability of the findings, there was no explanation in terms of target population or study population that could draw an inference of the study sample and the power of the test, although they were testing hypotheses. Consequently, the percentages or the ranks of the findings from previous studies were more likely to produce a somewhat confusing and unclear picture of the issue. Therefore, this portion of the literature review will be illustrated with those limitations.

Choo (1988) reported that Korean women who perceived fewer barriers tended to comply with the Pap test. Among Korean women a barrier factor was the second most important

predictor of the preventive health behavior in the Pap test (Choi, 1990). The literature provided several barriers of utilization of the Pap screening test. Those barriers have been recategorized for a unified review following the purpose of this proposed study.

The characteristics of the test itself and the procedure were revealed as an unavoidable barrier. This factor seemed to be directly connected to the psychological factor, and seemed to evoke the causes of the various psychological difficulties. As the Pap smear test requires access to the woman's internal women body, the cervix, those healthy women unconditionally have to adopt 'a psychologically vulnerable posture (Orbell et al., 1933)' to have the screening tests. As a result, those women perceived that the test and the procedure were too embarrassing, uncomfortable, painful, or undignified (Cockburn et al., 1992; Hurley, 1993; King, 1987; Orbell et al., 1993). Those who felt too embarrassed were reported about seven times more likely to delay having the test than those who did not in the study explored in Australia by Cockburn et al. (1992). Significantly negative correlations were found between older women and the characteristics of Pap test and the procedure itself (Hennig et al., 1990). In addition, anxiety of a positive test result or fear of the cancer, which may immediately bring up the image of death, was found as another psychological obstacle of the Pap smear

screening (Gutteling et al., 1986; Kim M-H, 1992; King, 1987).

Cultural factors which would reflect social influence have not been developed. Although the potential barrier has come to the surface by only a few studies, it appeared with simple statements, such as a cultural avoidance or constraints of medical tests, distrust of Western medicine, or a culturally irrelevant service due to their life style, particularly toward minority women in the United States and women in developing countries (Harlan et al., 1991; Lunt, 1984; UBA, 1992). However, it has not been investigated whether this factor was due to cultural training, in connection with how to deal with symptomatic or asymptomatic maladies, or with taboos regarding sexual organs. Gender bias towards smear takers might be a result of a considerable cultural influence. A study showed that 30% of the study subjects preferred female physicians (Roworth et al., 1988). Quilliam (1990) found that the media, which acts as a cultural transmitter, could produce a barrier by generating a stereotype for potential cervical cancer patients. If the media portrays those patients as having immoral diseases and leads the viewer to have a negative social prejudgment against them, this would elicit fear of the test results. Consequently, women would hesitate in taking the screening test.

It is not known whether the characteristics of the test itself and the procedure are products of the cultural factor. Information, in terms of pure barriers which are mutually exclusive among the three factors mentioned above, is not available through the literature at present.

The most important determinant with the personal factor was generally associated with women's situational pre-occupations such as 'too busy, illness, holiday, suffering from grief, and caring for a sick relative and so on (Jeong et al., 1992; Choo, 1988; Cockburn et al., 1992; Kim M-H, 1992; Orbell et al., 1993). The remaining reasons in this factor were: unable to arrange time/venue; forgetting; 'didn't get around to it'; 'just do not want the test'; perceived ineligibility due to the age or hysterectomy, life style, and habits; 'did not feel the necessity' or importance of the test (Peters et al., 1989); postponement or laziness; and unpleasant experience or mistreatment during a previous test (Sawyer et al., 1990). 'Not interested in the test' was revealed as a significant reason in two studies in Korea (Choi, 1990; Jeong et al., 1992).

The factor of health service provider was mostly dealing with reasons related to the physicians who were the smear takers. The main problem indicated in this issue was lack of recommendation by doctors (Harlan et al., 1991; Peters et al., 1989; Spurlock et al., 1992). Mamon et al. (1990) also observed the important role of physicians,

particularly gynecologists, in determining utilization of the Pap test. Ciatto et al. (1991), presented supportive outcomes employing subjects who were refusers of a Pap test for 10 years, in a call-recall system in Florence District in Italy. They reported that only 20% of those refusers who visited gynecologists were recommended to have the Pap smear test by the doctors. Another appreciable obstacle was negative previous experiences by health service providers. Those were primarily generated by doctors, regardless of their gender, by their attitudes, unclear and insensitive communication, and lack of explanation regarding the test procedure (Hurley, 1993; Peters et al., 1989). Doctors' negligence with older women was also reported (Peter et al., 1989).

Cost was the most frequently inquired barrier in the policy factor followed by frequency of the screening test and accessibility to cervical cancer screening services (Choo, 1988; Harlan et al., 1991; Peter et al., 1989). Cost seemed to be an indicative barrier, particularly for poor women and women in countries having a high cost of health care. In the study of Harlan et al. (1991), the cost was a more significant barrier for premenopausal women. No interpretation of the results was attempted in the study. Eddy (1990) produced an empirical burden of the cost, that is an average cost of a Pap smear test, by using a telephone survey of 20 institutions. The average of total charge

(laboratory charge + institution charge or physician fee) of a Pap test was $76, and the range was from $34 to more than $100 (Eddy, 1990). On the contrary, the cost did not seem a barrier of Pap test utilization in Korea. Only an insignificant percentage of women responded that cost was the barrier (6% in Choo's study and 3.8% in Kim M-H's study) (Choo, 1988; Kim M-H, 1992). The study results could be supported by the fact that the actual cost of a Pap test in Korea was at the highest less than $9 (Korean Medical Insurance Corporation, 1992; 1993). This cost was not covered by health insurance, likewise typical health insurance policies do not cover preventive health related exams such as the Pap smear test.

The policy on the frequency of the Pap screening test was the same as mentioned previously. Few Korean women (4.6%) indicated that complicated hospital procedures made them wary of cervical cancer screening services resulting in non-compliances (Choo, 1988).

The knowledge factor was an area on which numerous studies have been conducted. Most studies found that women with better knowledge of the Pap smear test or cervical cancer tended to be users of the test and to screen more frequently (Choi, 1990; Choo, 1988; Ciatto et al., 1991; Cockburn et al., 1992; Kim M-H, 1992; Nicoll et al., 1991). Higher socioeconomic status had an implication in better status in knowledge of the Pap smear screening test (Gordon

et al., 1990). In addition, younger women tended to have better knowledge than older women (Gordon et al., 1990). A thought that only a symptomatic woman needed a Pap smear test was a predisposing factor of being non-compliant (Ciatto et al., 1991) and more likely to be overdue for the test (Choo, 1988; Cockburn et al., 1992). In the same matter, the number one reason for having the first Pap test (44.5%) was due to questionable symptoms in Korean women (Kim M-H, 1992).

Women who have knowledge in terms of the time of initiation of the Pap test, when they are sexually active, were less likely to be delay having the test than women who did not (Cockburn et al., 1992). In addition, women who selected less frequent testing (less than 2 years Vs. 3 years or more) as a proper interval of the test were six times more likely to delay than women who did not (Cockburn et al., 1992). A previous normal result from the Pap test tended to mislead women into being non-recompliant (56.9%) (Kim M-H, 1992). Even though many women (60%) knew the importance of regular smears for early detection of the cancer, only half of this percentage of women (30%) perceived early diagnosis can lead to successful treatment (Gorden et al., 1990). Moreover, those who had the information that the Pap test was able to detect precancerous changes were very few (less than 15%) (Gorden et al., 1990). Comprehension about female anatomy and the

procedure of the Pap smear test were the weakest part of the knowledge within the knowledge factor (Gordon et al., 1990).

Definition of Secondary Prevention Health Behavior

The Pap smear screening test is viewed by scholars and field specialists in public health as a secondary prevention behavior (Baquet et al., 1987; Duelberg, 1992). In this context secondary prevention behavior means "a test to determine physiological changes in the body, while a person does not display symptoms" (Duelberg, 1992). Hence, the duration of survival after the cancer diagnosis is associated with this secondary prevention behavior.

Summary of the Chapter

Chapter 2 examined the literature related to the research questions. The research questions concerned with the selection of a proper population for cervical cancer control program, Pap smear screening guidelines, utilization of the Pap test, barrier factors associated with low utilization of the Pap smear screening and so forth.

CHAPTER 3

RESEARCH METHODOLOGY

Study Population

The base population of the 1995 portion of the study is the same as the KHBS's 1992 study. This population was selected by a systematic sampling method from the Korean Census in 1990 according to administrative districts and units. Among Korea's many islands, however, only CheJu island was included in the KHBS because of transportation and other logistical difficulties with the other islands. The percentage of islander households not included in the KHBS comprised fewer than 1% of all the households in the nation. In addition, only households with kinship members in same household were included in this KHBS.

Selection Process of the Study Population

The following process shown in Figure 2 was used for the selection of the KHBS population:

First, 185,149 districts were derived from the Korean Census districts of 1990. The number emerged after

exclusion of districts on islands, with the exception of CheJu island.

Second, among those districts from the Census, 110 sample districts containing 6,661 households were chosen for the KHBS. Sixty-seven city districts and forty-three county districts constituted the 110 sample districts.

Third, only one adult between the ages of 20-59 (2,919 households) was selected in every second household among households chosen at the previous stage. If there was more than one adult in the age category in the household, the adult whose birthday came earlier in the calendar year was chosen as the study subject in the KHBS.

Fourth, 95.9% (2,799 persons) of the 2,919 completed interviews and consequently became the sample of the KHBS.

Sample of the Study

The two data sets utilized in this study were from the 1992 KHBS and from the 1995 follow-up study of a subsample of the original sample.

From the KHBS sample, only women were designated for this study because the study topic was concerned with the Pap smear screening test. Those women whose answers were not completed for this study topic were omitted from the

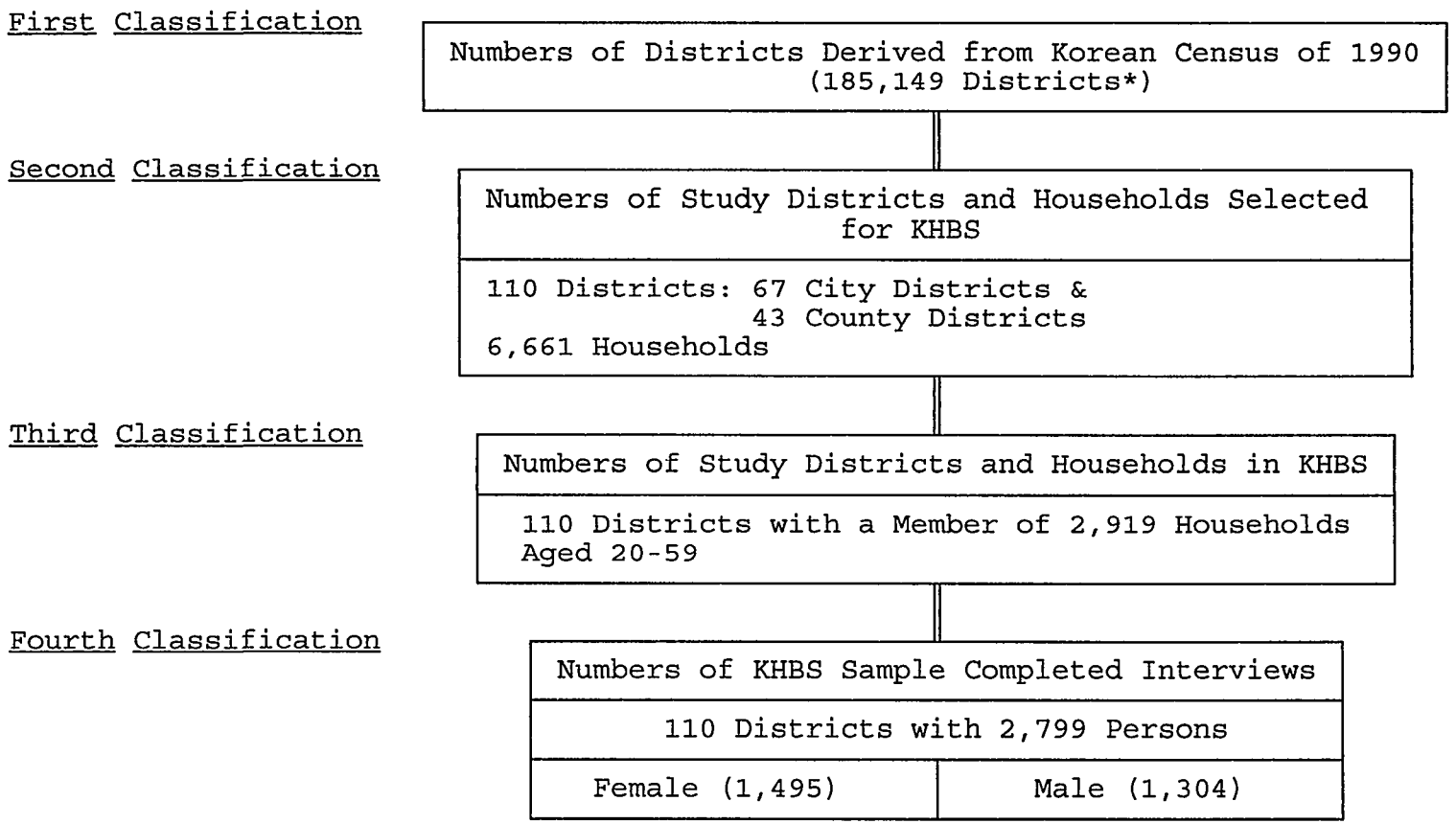


Figure 2. The Selection Process of the Study Population in KHBS

* A number after exclusion of districts on islands and in institution units.

1,495 KHBS female subjects. Therefore, 1,489 women residing in Korea aged 20-59 comprised the study sample.

Again, the 1995 study also followed up on the original 1,489 female sample from the KHBS. However, of the original sample who could still be traced only 424 women were responded.

Measurement of the Study

The measurement instrument (Appendix B) of this study has three sections; a section for the sociodemographic variables, a section for the Pap test history, and a section for the factors associated with barriers to utilizing the Pap test.

Measurement for the Sociodemographic Variables

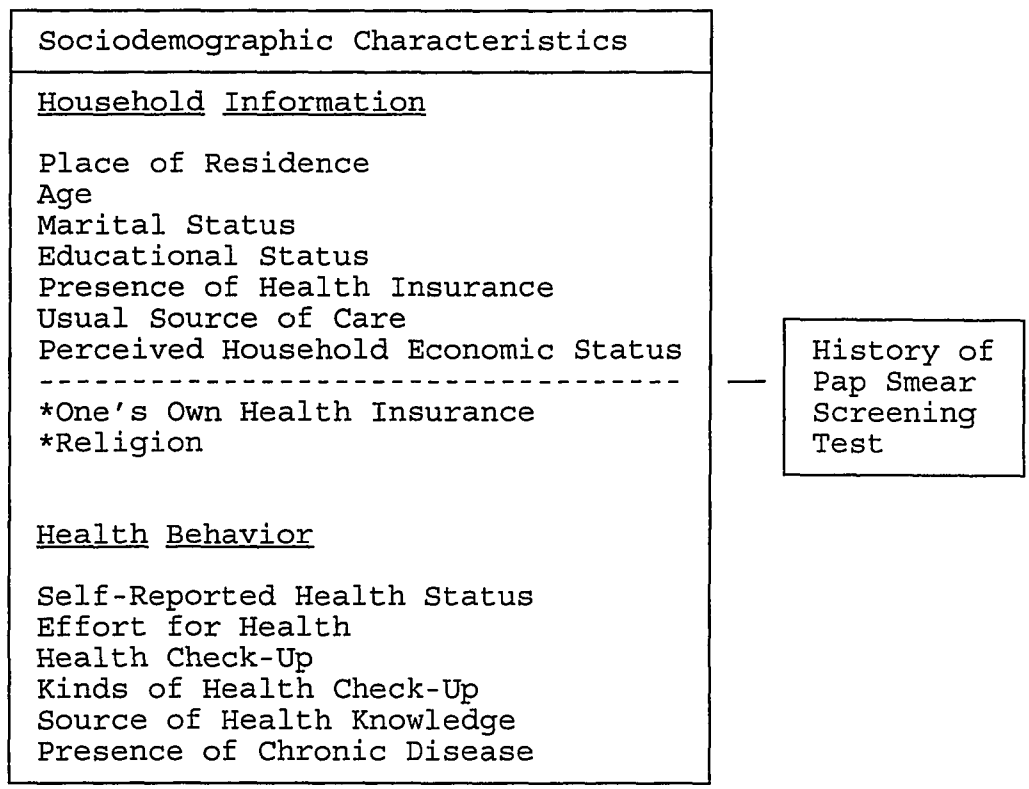
Measurement for sociodemographic variables for this study used some of the variables collected from the National Health Survey (NHS) conducted in 1992 in Korea. The NHS included five different segments and the KHBS covered one of those. Each section, however, was analyzed and published separately. For instance, the 1992 KHBS employed the same

variables from household information section of NHS for its sociodemographic variables.

From the five NHS data sections, household information and the KHBS variables on health behavior were categorized as sociodemographic variables to the usage of the Pap smear screening test for the purpose of this study (Figure 3). The questionnaires utilized for the two sections were structured questionnaires with closed-ended questions. The questionnaires contained 48 questions pertaining to household information and 65 questions regarding health behavior. Fourteen of the original 113 questions were selected in order to fulfill this study.

Information was utilized from seven questions contained in the section pertaining to household information. Those questions were 'place of residence' (urban, rural), 'age' (20-29, 30-39, 40-49, 50-59), 'marital status' (single, married, others: divorced, widowed), 'educational status' (none, elementary, middle, high school, junior college, above college), 'presence of health insurance' (none, health insurance for civil servants and private school employees, industrial establishment health insurance, regional health insurance, medical aid program), 'usual source of care' (none, hospital/clinic, health center/health subcenter, Korean traditional hospital, primary health care post, pharmacy, and 'perceived household economic status' (low, middle, high).

The remaining seven questions from the section on health behavior provided information on 'self-reported health status' (not good, fair, good), 'effort for health' (no, yes), 'health check-up' (no, yes), 'types of health check-up' (group: as part of group check-up, private: voluntary individual check-up), 'source of health knowledge' (TV/radio, neighbors: word of mouth, newspapers, weekly or monthly magazines, books/posters), 'presence of chronic



* 'One's own health insurance' and 'religion' variables were added in the 1995 follow-up study.

Figure 3. Measurement for the Sociodemographic Variables

disease' (no, yes). The definition of having a 'health check-up' was having a 'health check-up' within the year prior to the KHBS'. In the 'types of health check-up', 'group' check-up meant annual health maintenance check-ups provided by employers, while 'private' check-up indicated voluntary individual check-ups paid by personal payment.

For the purpose of comparison, the measurements related to the sociodemographic variables are the same in the two data sets utilized for this dissertation. In the 1995 follow-up study, however, two variables such as 'religion' (none, buddhism, Catholic, protestant, others) and 'one's own health insurance' of the study subjects (no, yes) were added.

Measurement for the Pap Test History

The questions concerning Pap smear test history were chosen as the dependent variables for this study. In order to measure the Pap test history, two steps were taken.

First, the variable of Pap test history divided the sample into two groups, a non-user group and a user group, following a KHBS question. The criterion of this split was determined by whether or not the women had taken the test within the year prior to the survey.

Second, questions on the Pap test history reclassified the study subjects into three groups in the 1995 follow-up study: a 'never' group (those who had never had a Pap test), a 'suspended' group (those who had suspended use of a Pap test after one or more participations), and a 'regular' group (those who had had regular Pap tests). The definition of a regular Pap test meant an annual Pap test during the three years prior to the 1995 study. To eliminate ineligible subjects, women were asked whether or not they had had a Pap test due to gynecologically associated symptoms, or had undergone a total hysterectomy, or had been diagnosed as a cervical cancer patient.

Measurement for Factors Associated with Barriers

In order to measure barriers to the Pap smear screening test utilization, six factors as shown in Figure 4 were conceptualized. Those were, 'factor of characteristics of Pap smear itself and the procedure'(Factor 1), 'cultural factor' (Factor 2), 'personal factor' (Factor 3), 'physician factor' (Factor 4), 'policy factor' (Factor 5), and 'knowledge factor' (Factor 6). The content and number of items in each factor are described in the operational definition of the factors associated with barriers. Each items related to those conceptualized factors to be examined

in this study was adopted from the previous studies obtained through the literature.

The Likert scale was employed to measure each item associated with those factors. All 29-item scales shown below were scored on a 5-point scale from 1 to 5: 1=strongly agree; 2=agree; 3=fair; 4=disagree; and 5=strongly disagree.

Operational Definitions of the Factors

Examples of operational definitions of the theoretical factors associated with barriers to Pap smear test utilization in this study are as follows:

1) The first factor was named as 'Factor of characteristics of a Pap smear itself and the procedure'. It is defined as items associated with the internal body examination, a Pap smear test (state of dress and posture required for the test, and discomfort or pains induced by the test equipment); and the following psychological reactions generated by the essential condition to take the Pap test (embarrassment, shame, discomfort, and fear of the abnormal test result) (three items: item number 1, 2, and 3).
2) 'Cultural factor' is defined as items related to cultural training in prevention behavior, unfamiliarity with Western medical examination, gender bias, and

cultural constraints in terms of sex-related organs (six items: item number 4, 5, 6, 7, 8,, and 9).

3) 'Personal factor' is defined as items pertaining to women's preoccupations such as busy personal schedules by work and family commitments, forgetfulness, perceived ineligibility to cervical cancer, and previous experiences with health providers in gynecological care (four items: item number 10, 11, 12, and 21).
4) 'Physician factor' is defined as items associated with attitudes of doctors, communication or directions for the test by doctors, and their recommendation for a Pap test (four items: item number 22, 25, 27, and 28).
5) 'Policy factor' is defined as items concerning the cost, accessibility of medical institutions for a Pap test, administrative process of medical institutions, health insurance policies, guidelines for the Pap smear test (six items: item number 14, 19, 23, 24, 26, and 29).
6) 'Knowledge factor' is defined as items associated with target population for the tests, its necessity and importance, the time to end, and the screening interval (six items: item number 15, 16, 17, 18, 20, and 32).

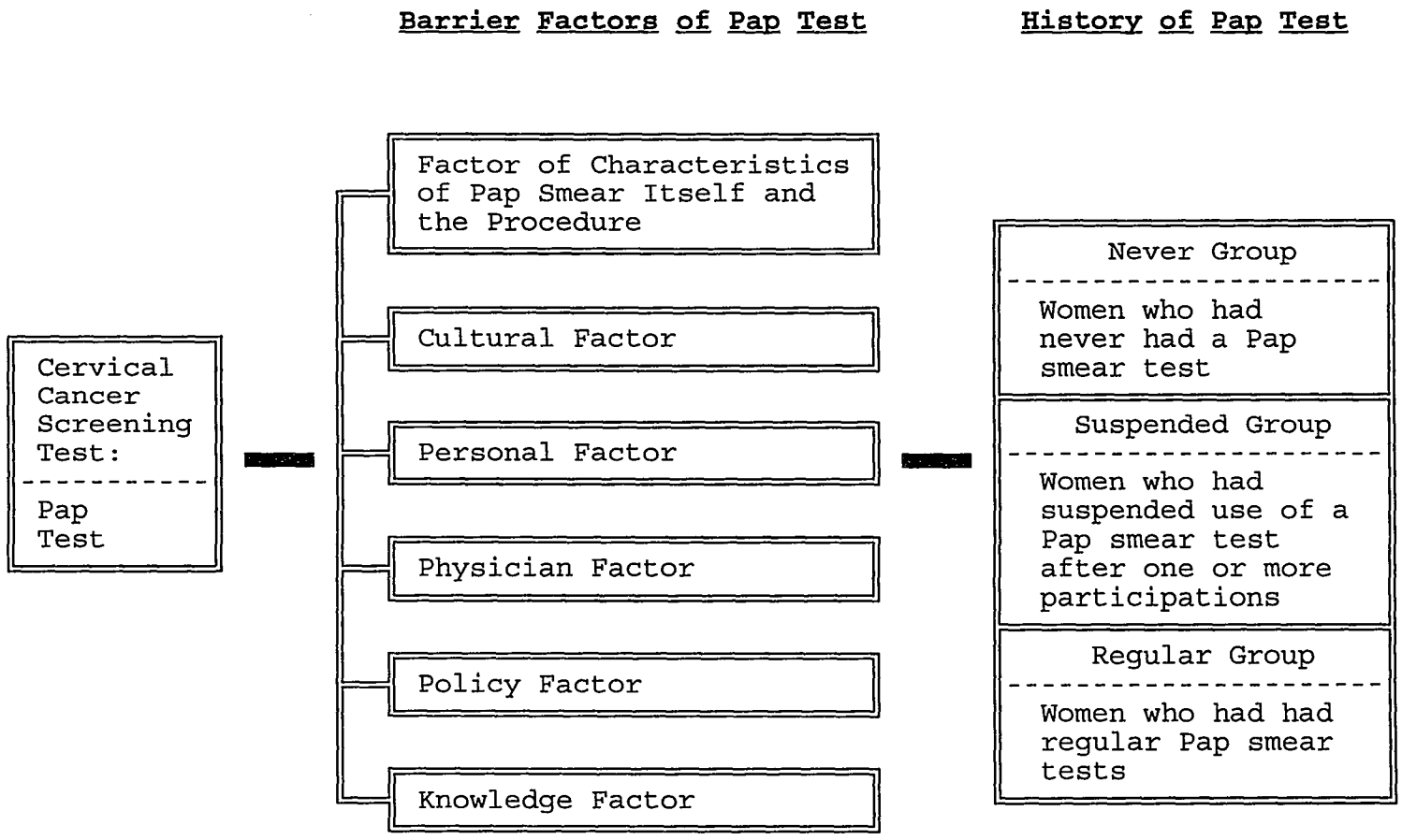


Figure 4. Framework for Factors Associated with Barriers of Pap Smear Screening Utilization

Data Collection

Data collection was carried out twice, in 1992 and in 1995, to fulfill the study purpose.

Data Collection for KHBS

For the 1992 KHBS, a combined method using a structured questionnaire with closed-ended questions and a personal interview was used in order to insure data quality. The data for the KHBS were collected by groups of specially trained interviewers in the established theory and practice of the Korean Institute for Health and Social Affairs (NIHSA). The period of data collection was from June 11, 1992 to July 10, 1993.

Data Collection for the 1995 Follow-up Study

The follow-up study, conducted in 1995, used a self-administered questionnaire with closed-ended questions. Due to financial limitations, this study employed a mailing method, since the study subjects dwell throughout the country.

To establish questionnaire validity, the research questionnaire was submitted to a cohort of research professionals in Korea for the purpose of confirming sentence construction and wording. This was done after achieving face validity of the questionnaire from the dissertation committee. The translation of the questionnaire from English to Korean was particularly scrutinized by a Korean language teacher before the main survey was started. Then, fifty Korean women, who were similar to main survey subjects, were given the questionnaire for pretesting. Through these processes five out of thirty-four questions on barriers of the Pap test utilization were omitted from the initially constructed questions.

The reliability of the instrument for the 29-item barriers was measured by Cronbach's Alpha (α). Cronbach's Coefficient Alpha for the total 29-item barriers scale was a raw alpha of .69. Each barrier factor revealed a Coefficient Alpha (raw variables) as follows: Factor 1, α=.52; Factor 2, α=.52; Factor 3, α= .45; Factor 4, α=.40; Factor 5, α=.37; and Factor 6, α=.45. Gold standard for this internal consistency reliability (α) and the adequacy of instrument used for this study is considered in Chapter 5.

In order to obtain those Coefficient Alpha, composite scores were first created from several items which formed

each theoretical factor. The average value of the items in each factor were calculated using only actual values, not missing values.

In an effort to raise the response rate, the questionnaire was reproduced professionally in order to obtain font, shape, and overall quality which would appeal to Korean people.

One thousand eighty nine (1,089) Korean women were followed up by their names, addresses, and the names of household heads acquired from KIHSA from June 8 to August 5 in 1995. In order to achieve a better response rate, three mailings at two week intervals were made. Again, to improve the response rate, telephone calls were made to those subjects, particularly living in the six major big cities with the population 1,000,000 and over. At the same time, lottery tickets were offered to the respondents of the third mailing as a means of inducement.

Yet, despite an intensive follow up of each subject, the response rate achieved was 39.5% (total 424 persons). This was obtained after deleting returned cases from the post offices. Those cases were generated by inability to trace study subjects such as imperfect addresses, moving, marriage, divorce, and reconstruction and redevelopment of the area and so on.

Data Analysis

The SAS software version 6.04 for PC use was employed to analyze the data obtained for this study.

First, descriptive analyses were performed by means of frequency distributions. Percentage distributions of independent variables were used to depict the demographic profiles of the study samples and each dependent variable category.

Second, study validity was examined by matching subjects between the 1992 KHBS and the 1995 follow-up study using three major sociodemographic variables such as age, educational status, and marital status. This was done instead of lost case analysis. Those variables were chosen as they were regarded as found to be relatively stable during the 3 years. For this purpose, bivariate analysis was conducted between the two groups.

Third, bivariate analysis was performed between the dependent variable and each independent variable to explain the unadjusted association between them.

Fourth, logistic regression analysis was conducted in order to investigate the sociodemographic predictor variables influencing Pap smear utilization. The category of the outcome variable in the two groups was 'having a Pap test within last year' vs 'not having a Pap test within last year'. In the three groups, those were 'those who had ever

had a Pap test' vs 'those who never had a Pap test' for the 'never' group; 'those who had suspended a Pap test after one or more participations' vs 'those who had not suspended a Pap test after one or more participations for the 'suspended' group; and 'those who had had regular Pap tests' vs 'those who had not had regular Pap tests' for the 'regular' group.

Fifth, for only the 1995 follow-up study pertaining barrier factors, composed scores were calculated. Then, some of the items were modified to indicate the same direction.

Finally, with the composite scores, again logistic regression analysis was engaged to observe the degree of contribution of each barrier factor according to the groups with different Pap test history. The category of each outcome variable was the same as described above.

Summary of the Chapter

Chapter 3 described the research methodology for this study to include the study population, the sample, and measurements used in the study as well as data collection and data analysis methodology.

CHAPTER 4

FINDINGS

This Chapter presents the findings of this study. The descriptions of the summary statistics are followed by findings related to the three major research questions such as the sociodemographic profiles of the study sample, the meaningful predictors of the usage of the Pap smear screening test, and the barrier factors to the Pap smear test utilization.

Sociodemographic Profiles of Korean Women

This section provides findings related to the research question 1 and the following three sub-questions. Those questions are: question 1) what are the sociodemographic profiles of Korean women residing in Korea according to their Pap smear test history?; question 1.1) what are the differences upon the sociodemographic profiles of Korean women between those who had had a Pap smear test and those who had not in the 1992 KHBS study and in the 1995 follow-up study?; question 1.2) what are the differences upon sociodemographic profiles of Korean women among the following three groups: those who had never had a Pap test

(never group), those who had suspended use of a Pap test after one or more participations (suspended group), and those women who had had regular Pap tests (regular group) in the 1995 study?; question 1.3) Is there a different trend in the prevalence of the Pap smear utilization according to time, from 1989 to 1995?

The summary tables in this section show the frequency and the percentage distribution of 1) Pap smear use in 1992 KHBS and 1995 studies; 2) major sociodemographic characteristics of the total sample and of the Pap use groups, non-user and user groups in both 1992 study and the 1995 follow-up study; and 3) the category of Pap test history groups, the 'never', the 'suspended', and the 'regular' groups. Those tables also display unadjusted bivariate associations between usage of the Pap test and major sociodemographic characteristics in both 1992 and 1995 studies, and between Pap history groups and sociodemographic characteristics in the 1995 study. The statistical differences between the non-user and the users groups and among the three Pap history groups were determined by Chi-Square Test at the level of $P < .05$. In addition, a table (Table 31) presents the percentage distribution of the prevalence of the Pap smear utilization by year.

The numbers in the summary tables for the frequency distribution not totaling n value reflect unanswered questions and the percentages were rounded off from the

second prime numbers. The total number in Pap test of the 1995 study had 16 observations missing.

The outcome, with regard to whether or not those two study samples of the 1992 KHBS and the 1995 follow-up study were similar, is produced below.

Comparison of the study samples. The three relatively stable sociodemographic variables, 'age', 'marital status', and 'educational status' were examined between the samples of the 1992 and the 1995 studies by the Chi-square Test at the level of $P < .05$. As shown in Table 1, 'age' ($x^2=12.783$, df=3, p=.005) and 'educational status' ($x^2=13.842$, df=5, p=.017) were statistically significant, while 'marital status' was not significant. It can be noted that a quite higher percentage of the '43-52' age category (27.7%) were involved in the 1995 study than were found in the 1992 study (the '40-49' age group, 20.2%) (see Table 4). Noticeable differences between the 1992 and the

Table 1. Summary Results of Comparable Variables Between the 1992 KHBS and the 1995 Follow-up Studies by Bivariate Analysis

VARIABLES	CHI-SQUARE	DF	P-VALUE
Age	$x^2=12.783$	3	p=.005 *
Marital Status	$x^2= 2.735$	2	p=.255
Educational Status	$x^2=13.842$	5	p=.017 *

* = P <.05
DF: Degree of Freedom

1995 samples on the 'educational status' were found in the categories of 'none' and 'junior college'. A smaller percentage of women in the category of 'none' (4.0%) responded in the 1995 study than in the same category of the 1992 (9.2%) study, whereas a larger percentage of women in the category of 'junior college' was included in the 1995 study (7.7%) compared to the 1992 study (4.2%) (see Table 6).

Pap smear use. Table 2 shows Pap smear use in Korean women in 1992 and 1995 studies.

Table 2. Pap Smear Use in Korean Women

PAP TEST	in 1992 KHBS	in 1995 STUDY
Non-User	1074 (72.1%)	261 (64.0%)
User	415 (27.9%)	147 (36.0%)
Total	1489 (100.0%)	* 408 (100.0%)

* From the total 424 subjects in 1995 study, 16 subjects have missing information.

The sample from the 1992 study consisted of 1,489 Korean women aged 20-59 residing in Korea. One thousand seventy-four women (72.1%) responded that they had not had a Pap smear test within the year prior to the survey while only 415 women (27.9%) had been tested. Although all of the subjects of the 1992 study were sent follow up

questionnaires in 1995, only 424 Korean women aged '23-62' residing in Korea responded to this survey. Among them, 261 women (64.0%) had not had a Pap test within the year prior to the survey, while 147 women (36.0%) had obtained it.

Sociodemographic Profiles for Two Groups: Non-user vs. User

Place of residence (Table 3). The majority of the study subjects lived in 'urban' areas in both 1992 and 1995 with similar percentage distributions (65.1% in 1992 and 67.2% in 1995).

Table 3. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Place of Residence

VARIABLE PLACE OF RESIDENCE	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
Urban	970 (65.1)	677 (63.0)	293 (70.6)
Rural	519 (34.9)	397 (37.0)	122 (29.4)
Chi-square Test	x^2=7.548	df=1	p=.006 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
Urban	274 (67.2)	173 (66.3)	101 (68.7)
Rural	134 (32.8)	88 (33.7)	46 (31.3)
Chi-square Test	x^2=0.251	df=1	p=.617

* = P < .05
df: degree of freedom

An unadjusted bivariate association between non-users and users was significant in 1992 study at the level of P < .05 (x^2=7.548, df=1. p=.006). More Pap smear users tended to live in 'urban' settings than non-users in 1992. A statistical significance was not found in the 1995 study.

Age (Table 4). Women in the '30-39' age category constituted the highest proportion (32.2%) and other age categories were distributed in similar proportion in the 1992 study. Although the '32-42' age category (32.4%) still constituted the highest proportion in the 1995 sample, the '53-62' age category (17.5%) was disproportionately smaller

Table 4. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Age

VARIABLE AGE	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
20-29	388 (26.1)	329 (30.6)	59 (14.2)
30-39	479 (32.2)	290 (27.0)	189 (45.5)
40-49	300 (20.2)	189 (17.6)	111 (26.7)
50-59	322 (21.6)	266 (24.8)	56 (13.5)
Chi-square Test	x^2=92.971	df=3	p=.000 *
Pap Test in 1995 Study **			
Total	408 (100.0)	261 (100.0)	147 (100.0)
23-32	91 (22.5)	70 (27.1)	21 (14.3)
33-42	131 (32.4)	71 (27.5)	60 (40.8)
43-52	112 (27.7)	71 (27.5)	41 (27.9)
53-62	71 (17.5)	46 (17.8)	25 (17.0)
Chi-square Test	x^2=12.037	df=3	p=.007 *

* = P < .05
** Age in 1995 study was added up 3 years to age in 1992.
df: degree of freedom

than the two other age categories, the '23-32' age category (22.5%) and the '43-52' age category (27.7%).

A statistical difference was found between non-user and user groups in both the 1992 (x^2=92.971, df=3, p=.000) and 1995 (x^2=12.037, df=3, p=.007) studies on the variable of the 'age'. In 1992, the highest proportion of Pap smear users were in the '30-39' age category (45.5%) whereas the '20-29' age category was the leading age category (30.6%) among non-users. In addition, among users of the 1992 study, the '50-59' age category (13.5%) had the lowest proportion followed by the '20-29' age category (14.2%). In 1995, the user group with the highest proportion was the '33-42' age category (40.8%) while in the non-user group, the '23-32', '33-42', '43-52' age categories yielded similar percentage distributions of 27.1%, 27.5%, and 27.5% respectively. The user group with the smallest proportion was the '23-32' age category (14.3%) and the non-user group age category with the smallest proportion was the '53-62' category with 17.8%.

Marital status (Table 5). The proportion of 'married' women (77.2% in 1992 and 80.6% in 1995) was noticeably higher than 'single' women (13.8% in 1992 and 11.2% in 1995) in both the 1992 and 1995 samples. There were no proportional differences among categories of 'marital status' in the 1995 study compared to the 1992 study.

There were statistical differences between non-users and users with respect to 'marital status' in both 1992 (x^2=60.308, df=2, p=.000) and 1995 (x^2=19.167, df=2, p=.000). The most distinctive finding was that approximately 90% of users were 'married' women and merely 3% of users were 'single' in both study samples. However, the proportions of 'single' women in the non-user groups were 17.8% in 1992 and 15.8% in 1995 which was about 5 times the proportion of 'single' women in the user group in both 1992 (3.4%) and 1995 (2.8%). Correspondingly, the proportion of 'married' women in the non-user group was much

Table 5. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Marital Status

VARIABLE MARITAL STATUS	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
Single	205 (13.8)	191 (17.8)	14 (3.4)
Married	1150 (77.2)	777 (72.3)	373 (89.9)
Others	134 (9.0)	106 (9.9)	28 (6.7)
Chi-square Test	x^2=60.308	df=2	p=.000 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
Single	45 (11.2)	41 (15.8)	4 (2.8)
Married	324 (80.6)	193 (74.5)	131 (91.6)
Others	33 (8.2)	25 (9.7)	8 (5.6)
Chi-square Test	x^2=19.167	df=2	p=.000 *

* = P < .05
df: degree of freedom
others: divorced, widowed, and others

smaller than that of the 'married' women in the user group in both study samples.

Educational status (Table 6). In education, women with 'high school' diplomas comprised the highest proportion in both the 1992 (36.7%) and 1995 (35.9%) samples, whereas the smallest group was 'junior college' graduates (4.2%) in 1992 sample and women with no formal education (4.0%) in 1995 sample. Fewer percentage of subjects with no education

Table 6. Frequencies, Percentage Distributions and Bivariate Analysis of Pap Smear Use Among Korean Women by Educational Status

VARIABLE EDUCATIONAL STATUS	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
None	136 (9.2)	118 (11.0)	18 (4.3)
Elementary School	346 (23.3)	258 (24.1)	88 (21.2)
Middle School	271 (18.3)	176 (16.5)	95 (22.9)
High School	544 (36.7)	390 (36.5)	154 (37.1)
Junior College	62 (4.2)	47 (4.4)	15 (3.6)
Above College	125 (8.4)	80 (7.5)	45 (10.8)
Chi-square Test	x^2=26.987	df=5	p=.000 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
None	16 (4.0)	13 (5.1)	3 (2.1)
Elementary School	99 (24.7)	67 (26.1)	32 (22.2)
Middle School	84 (21.0)	52 (20.2)	32 (22.2)
High School	144 (35.9)	82 (31.9)	62 (43.1)
Junior College	31 (7.7)	24 (9.3)	7 (4.9)
Above College	27 (6.7)	19 (7.4)	8 (5.6)
Chi-square Test	x^2=8.825	df=5	p=.116

* = P < .05
df: degree of freedom

were involved in the 1995 study (9.2% in the 1992 study, 4.0% in the 1995 study).

A statistical significance was found only in the 1992 sample (x^2=26.987, df=5, p=.000). The user group in 1992 tended to be more highly educated than the non-user group. A much smaller proportion of users (4.3%) did not have any formal education compared to non-users (11.0%) in the 1992 sample.

Insurance status (Table 7). Enrollment in 'regional' (47.1% in 1992 and 41.3% in 1995) and 'industrial'

Table 7. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Insurance Status

VARIABLE INSURANCE STATUS	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
None	78 (5.2)	66 (6.1)	12 (2.9)
Civil	106 (7.1)	76 (7.1)	30 (7.2)
Industrial	530 (35.6)	363 (33.8)	167 (40.2)
Regional	701 (47.1)	510 (47.5)	191 (46.0)
Medical Aid	74 (5.0)	59 (5.5)	15 (3.6)
Chi-square Test	x^2=11.812	df=4	p=.019 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
None	13 (3.2)	10 (3.9)	3 (2.1)
Civil	56 (13.9)	29 (11.2)	27 (18.8)
Industrial	124 (30.9)	79 (30.6)	45 (31.3)
Regional	166 (41.3)	111 (43.0)	55 (38.2)
Medical Aid	43 (10.7)	29 (11.2)	14 (9.7)
Chi-square Test	x^2=5.393	df=4	p=.249

* = P < .05
df: degree of freedom

establishment health insurance (35.6% in 1992 and 30.9% in 1995) were dominant among those with health insurance in both studies. The proportion of those with 'civil' (13.9%) and 'medical aid' (10.7%) groups in 1995 study were almost doubled whereas the proportion of women with no insurance appeared relatively reduced compared to the 1992 sample.

A statistically significant association on 'insurance status' was found only in 1992 study (x^2=11.812, df=4, p=.019). In 1992, just 2.9% of user women had no health insurance compared to 6.1% of the non-user women. Besides, the proportion of those with 'industrial' establishment health insurance was higher in the user group (40.2%) then in non-user group (33.8%) in 1992 study.

Usual source of care (Table 8). A large proportion (66.6%) of the 1992 study sample said that they had no 'usual source of care' or consultation when they were sick. On the other hand, merely 10.3% of the 1995 sample did not indicate a 'usual source of care'. Those were the most striking differences between the samples in the two studies. Women who gave 'hospital/clinic' as their response comprised the second highest group (18.9%) in 1992. 'Hospital/clinic' (52.9%) was the most 'usual source of care' followed by 'pharmacy' (22.1%) in 1995.

The statistically significant associations were found on this variable in both study samples (x^2=27.250, df=5, p=.000 in 1992; x^2=20.528, df=5, p=.001 in 1995). users

indicated having 'hospital/clinic' care were in higher proportion (26.5% in 1992 and 67.4% in 1995) than non-users (16.1% in 1992 and 44.8% in 1995) in both 1992 and 1995. Furthermore, it was noted that a higher percentage of non-user women in both study samples (70.1% in 1992 and 13.0% in 1995) did not have any source of care compared to user women (58.0% in 1992 and 5.4% in 1995). In 1995, 'pharmacy' was a more important 'usual source of care' among the non-user group (26.1%) than user group (15.0%).

Table 8. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Usual Source of Care

VARIABLE USUAL SOURCE OF CARE	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
None	983 (66.9)	747 (70.1)	236 (58.0)
Hospital/Clinic	279 (19.0)	171 (16.1)	108 (26.5)
Health Center	23 (1.6)	14 (1.3)	9 (2.2)
Traditional Hospital	18 (1.2)	11 (1.0)	7 (1.7)
Primary Care Post	31 (2.1)	20 (1.9)	11 (2.7)
Pharmacy	136 (9.3)	100 (9.4)	36 (8.9)
Chi-square Test	x^2=27.250	df=5	p=.000 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
None	42 (10.3)	34 (13.0)	8 (5.4)
Hospital/Clinic	216 (52.9)	117 (44.8)	99 (67.4)
Health Center	25 (6.1)	18 (6.9)	7 (4.8)
Traditional Hospital	13 (3.2)	9 (3.5)	4 (2.7)
Primary Care Post	22 (5.4)	15 (5.8)	7 (4.8)
Pharmacy	90 (22.1)	68 (26.1)	22 (15.0)
Chi-square Test	x^2=20.528	df=5	p=.001 *

* = P < .05
df: degree of freedom

Perceived household economic status (Table 9). A majority of the sample in both studies perceived that their household economic status was in the 'middle'. The proportion of the 'middle' category was increased in 1995 (77.9%) compared to in 1992 (58.8%), whereas the proportion of the 'low' category was decreased from 36.5% in 1992 to 18.9% in 1995.

Perceived household economic status yielded a statistically significant association in the 1992 sample (x^2=16.503, df=2, p=.000) while it was nonsignificant in the 1995 sample. In 1992, users of the Pap test tended to

Table 9. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Perceived Household Economic Status

VARIABLE PERCEIVED HOUSEHOLD ECONOMIC STATUS	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
Low	538 (36.5)	420 (39.4)	118 (28.8)
Middle	868 (58.8)	603 (56.6)	265 (64.6)
High	70 (4.7)	43 (4.0)	27 (6.6)
Chi-square Test	x^2=16.503	df=2	p=.000 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
Low	77 (18.9)	52 (19.9)	25 (17.0)
Middle	318 (77.9)	202 (77.4)	116 (78.9)
High	13 (3.2)	7 (2.7)	6 (4.1)
Chi-square Test	x^2=1.030	df=2	p=.598

* = P < .05
df: degree of freedom

perceive their household economic status higher than did non-users.

Self-reported health status (Table 10). Those who reported their health status was 'not good' showed a similar distribution between the 1992 (24.1%) and 1995 (23.3%) samples. The leading category of 'self-reported health status' was 'good' (46.3%) in 1992 and 'fair' (52.3%) in 1995. Women who indicated the 'good' category were markedly decreased in 1995 (24.3%) compared to 1992 (46.3%).

No statistical significant associations were found in either the 1992 or 1995 study samples.

Table 10. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Self-reported Health Status

VARIABLE SELF-REPORTED HEALTH STATUS	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
Not Good	359 (24.1)	255 (23.8)	104 (25.1)
Fair	440 (29.6)	321 (29.9)	119 (28.7)
Good	689 (46.3)	497 (46.3)	192 (46.3)
Chi-square Test	x^2=0.364	df=2	p=.834
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
Not Good	95 (23.3)	63 (24.1)	32 (21.9)
Fair	213 (52.3)	134 (51.3)	79 (54.1)
Good	99 (24.3)	64 (24.5)	35 (24.0)
Chi-square Test	x^2=0.346	df=2	p=.841

* = P < .05
df: degree of freedom

Effort for health (Table 11). Relatively more women (57.1% in 1992 and 51.0% in 1995) made 'no' effort for their health than women who did (42.9% in 1992 and 49.0% in 1995) in both 1992 and 1995. The proportion of women who made efforts for their health slightly increased in 1995 sample compared to 1992 sample.

Only the 1995 study sample showed statistically significant association between non-user and user groups (x^2=6.092, df=1, p=.014). User women (57.1%) tended to made a little more effort for their health than non-user women (44.4%) did in 1995.

Table 11. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Effort for Health

VARIABLE EFFORT FOR HEALTH	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
No	850 (57.1)	628 (58.5)	222 (53.5)
Yes	639 (42.9)	446 (41.5)	193 (46.5)
Chi-square Test	x^2=3.029	df=1	p=.082
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
No	207 (51.0)	144 (55.6)	63 (42.9)
Yes	199 (49.0)	115 (44.4)	84 (57.1)
Chi-square Test	x^2=6.092	df=1	p=.014 *

* = P < .05
df: degree of freedom

Health check-up (Table 12). A substantial proportion of women (78.1%) in 1992 did not have a 'health check-up' within the last year before the KHBS. The proportion of women who did not have a 'health check-up' within the last year notably decreased from 78.1% in 1992 to 57.4% in 1995.

There were significant differences between non-users and users in 1992 (x^2=34.692, df=1, p=.000) and in 1995 (x^2=60.872, df=1, p=.000). With regard to having a 'health check-up' within the last year before KHBS, the users had a higher proportion (32.0%) than non-users (18.0%) in 1992. This tendency was also found in 1995 with the wider gap between users (68.0%) and non-users (28.2%) compared to the 1992 sample.

Table 12. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Health Check-up

VARIABLE HEALTH CHECK-UP	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
No	1163 (78.1)	881 (82.0)	282 (68.0)
Yes	326 (21.9)	193 (18.0)	133 (32.0)
Chi-square Test	x^2=34.692	df=1	p=.000 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
No	233 (57.4)	186 (71.8)	47 (32.0)
Yes	173 (42.6)	73 (28.2)	100 (68.0)
Chi-square Test	x^2=60.872	df=1	p=.000 *

* = P < .05
df: degree of freedom

Types of health check-up (Table 13). Women who did have a 'health check-up' within the last year were more likely to have a 'health check-up' privately in both study samples. Women who had a 'health check-up' showed a slightly increasing trend toward having a 'private health check-up' in 1995 study (52.5% in 1992, 59.2% in 1995).

The association between usage of the Pap test and 'types of health check-up' was only significant in 1992 study (x^2=10.472, df=1, p=.000). In terms of having a 'private health check-up', user women (63.4%) were found in higher proportion than in non-user women (45.0%), whereas having a 'group health check-up' was more frequent among non-users (55.0%) than among users (36.6%) in 1992.

Table 13. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Types of Health Check-up

VARIABLE TYPES OF HEALTH CHECK-UP	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	322 (100.0)	191 (100.0)	131 (100.0)
Group	153 (47.5)	105 (55.0)	48 (36.6)
Private	169 (52.5)	86 (45.0)	83 (63.4)
Chi-square Test	x^2=10.472	df=1	p=.000 *
Pap Test in 1995 Study			
Total	147 (100.0)	64 (100.0)	83 (100.0)
Group	60 (40.8)	30 (46.9)	30 (36.1)
Private	87 (59.2)	34 (53.1)	53 (63.9)
Chi-square Test	x^2=1.722	df=1	p=.189

* = P < .05
df: degree of freedom

Source of health knowledge (Table 14). 'Television and radio' were the most frequent sources for health related information in both 1992 (54.9%) and 1995 (54.6%). On the other hand, 13.1% of the 1992 sample did not have access to any of the categories of 'sources of health knowledge'. That indication declined slightly in 1995 to 8.6%.

The statistical association between the usage of the Pap test and 'source of health knowledge' was barely significant in the 1992 sample alone (x^2=11.126, df=5,

Table 14. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Source of Health Knowledge

VARIABLE SOURCE OF HEALTH KNOWLEDGE	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
None	195 (13.1)	154 (14.3)	41 (9.9)
TV/Radio	817 (54.9)	594 (55.3)	223 (53.7)
Neighbors	161 (10.8)	114 (10.8)	45 (10.8)
Newspapers	127 (8.5)	81 (7.5)	46 (11.1)
Magazines	41 (2.8)	30 (2.8)	11 (2.7)
Books/Posters	148 (10.0)	99 (9.2)	49 (11.8)
Chi-square Test	x^2=11.126	df=5	p=.049 *
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
None	35 (8.6)	20 (7.7)	15 (10.3)
TV/Radio	221 (54.6)	144 (55.6)	77 (52.7)
Neighbor	65 (16.1)	42 (16.2)	23 (15.8)
Newspapers	49 (12.1)	27 (10.4)	22 (15.1)
Magazines	14 (3.5)	11 (4.3)	3 (2.1)
Books/Posters	21 (5.2)	15 (5.8)	6 (4.1)
Chi-square Test	x^2=4.328	df=5	p=.503

* = P < .05
df: degree of freedom

p=.049). A higher proportion of non-users (14.3%) had no 'source of health knowledge' compared with users (9.9%) in the 1992 study.

Presence of chronic disease (Table 15). About 66% of the 1992 sample reported that they had 'no' chronic diseases while 34.1% of women reported having a chronic disease. A higher proportion of women (72.8%) in the 1995 sample answered that they had 'no' chronic diseases than did women in 1992 (65.9%).

There were no significant associations between usage of the Pap test and 'presence of chronic disease' in both the 1992 and 1995 samples.

Table 15. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use Among Korean Women by Presence of Chronic Disease

VARIABLE PRESENCE OF CHRONIC DISEASE	TOTAL n (%)	NON-USER n (%)	USER n (%)
Pap Test in 1992 KHBS			
Total	1489 (100.0)	1074 (100.0)	415 (100.0)
No	981 (65.9)	732 (67.2)	259 (62.4)
Yes	508 (34.1)	352 (32.8)	156 (37.6)
Chi-square Test	x^2=3.088	df=1	p=.079
Pap Test in 1995 Study			
Total	408 (100.0)	261 (100.0)	147 (100.0)
No	295 (72.8)	185 (71.2)	110 (75.9)
Yes	110 (27.2)	75 (28.9)	35 (24.1)
Chi-square Test	x^2=1.043	df=1	p=.307

* = P < .05
df: degree of freedom

Sociodemographic Profiles for Three Groups: Never, Suspended, and Regular Groups

Two sociodemographic variables were added to the original 1992 questions for the purpose of the 1995 study in this section. Those were 'religion' and 'one's own health insurance' as a measure of subjects' employment status.

From the total 424 study subjects in the 1995 follow-up study, women who underwent a Pap test due to gynecologically associated symptoms (78 persons), who had a total hysterectomy (32 persons), and who were already diagnosed as a cervical cancer patient (12 persons) were omitted in order to avoid any influences on the Pap utilization behavior of the study subjects.

Place of residence (Table 16). A majority of the sample was 'urban' dwelling (69.1%).

Table 16. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Place of Residence

VARIABLE PLACE OF RESIDENCE	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
Urban	197 (69.1)	92 (67.2)	74 (70.5)	31 (72.1)
Rural	88 (30.9)	45 (32.9)	31 (29.5)	12 (27.9)
Chi-square Test		x^2=0.517	df=2	p=.772

* = P < .05
df: degree of freedom

Although there was no significant association between Pap history groups and 'place of residence', each Pap history group revealed the same tendency to be 'urban' dwelling as the total the sample had showed. In addition, the 'regular' group (72.1%) tended to live in 'urban' settings slightly more than any other groups, while the 'never' group (67.2%) showed the lowest proportion of 'urban' residences though not significantly so.

Age (Table 17). The '33-42' age category (30.7%) comprised the highest proportion while the '53-62' age category (16.6%) showed the lowest proportion in total sample.

'Age' was found to be associated significantly with the Pap history groups (x^2=43.132, df=6, p=.000). The youngest age category, '23-32', presented the largest size in the 'never' group (40.7%) and the rest of the age

Table 17. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Age

VARIABLE AGE	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
23-32	72 (25.4)	55 (40.7)	13 (12.4)	4 (9.3)
33-42	87 (30.7)	28 (20.7)	40 (38.1)	19 (44.2)
43-52	77 (27.2)	26 (19.3)	40 (38.1)	11 (25.6)
53-62	47 (16.6)	26 (19.3)	12 (11.4)	9 (20.9)
Chi-square Test		x^2=43.132	df=6	p=.000 *

* = P < .05
df: degree of freedom

categories in this group had similar distributions (20.7%, 19.3%, and 19.3% respectively). In the 'suspended' group, both the '33-42' and '43-52' age categories showed the same proportions (38.1%). In the 'regular' group, the '33-42' age category constituted the highest proportion (44.2%), followed by the '43-52' (25.6%) and the '53-62' (20.9%) age categories. However, the '23-32' age category of the 'regular' group showed the lowest proportional difference (9.3%) among the categories in the 'regular' group.

Marital status (Table 18). 'Married' women (78.6%) was the largest category of this sample and the proportion of 'single' (14.3%) was almost double that of 'others' (7.1%).

The statistical association between 'marital status' and Pap history group was highly significant (x^2=42.250, df=4, p=.000). 'Married' women were a majority in all

Table 18. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Marital Status

VARIABLE MARITAL STATUS	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
Single	40 (14.3)	38 (27.9)	1 (1.0)	1 (2.4)
Married	220 (78.6)	87 (64.0)	94 (92.2)	39 (92.9)
Others	20 (7.1)	11 (8.1)	7 (6.9)	2 (4.8)
Chi-square Test		x^2=42.250	df=4	p=.000 *

* = P < .05
df: degree of freedom
others: divorced, widowed, and others

of the three Pap history groups, particularly in the 'suspended' group (92.2%) and the 'regular' group (92.9%). However, a much smaller proportion of 'married' women (64.0%) was found in the 'never' group.

Educational status (Table 19). The highest proportion was found in the category of 'high school' graduates (35.8%) in education. Women in the category of 'none' (3.9%) were the smallest group followed by the category of 'above college' degree (7.9%) in this sample.

Statistical significance was found in this variable (x^2=23.164, df=10, p=.010). The 'never' group indicated a relatively different percentage distribution from the 'suspended' group and the 'regular' group. The 'never' group was noticeable by having the highest proportion in

Table 19. Frequencies, Percentage Distributions and Bivariate Analysis of Pap Smear Use in Three Groups by Educational Status

VARIABLE EDUCATIONAL STATUS	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
None	11 (3.9)	8 (5.8)	2 (2.0)	1 (2.3)
Elementary	63 (22.6)	31 (22.6)	26 (26.3)	6 (14.0)
Middle	56 (20.1)	25 (18.3)	22 (22.2)	9 (20.9)
High	100 (35.8)	38 (27.7)	40 (40.4)	22 (51.2)
Junior Co.	27 (9.7)	22 (16.1)	3 (3.0)	2 (4.7)
Above Co.	22 (7.9)	13 (9.5)	6 (6.1)	3 (7.0)
Chi-square Test		x^2=23.164	df=10	p=.010 *

* = P < .05
df: degree of freedom

women with no education (5.8%) among the three Pap history groups as well as women with 'junior college' graduates (16.1%) and 'above' (9.5%). In both the 'suspended' and the 'regular' groups, the highest proportion comprised women with 'high school' diplomas (40.4% and 51.2%, respectively).

Insurance status (Table 20). Most people reported having 'regional' health insurance (41.3%) followed by 'industrial' establishment health insurance (29.9%). Only 3.9% of those with no health insurance were included in the sample.

No statistical significance was found in this variable.

Table 20. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Insurance Status

VARIABLE INSURANCE STATUS	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
None	11 (3.9)	9 (6.7)	2 (1.9)	. .
Civil	41 (14.6)	16 (11.9)	18 (17.1)	7 (16.7)
Industrial	84 (29.9)	43 (32.1)	29 (27.6)	12 (28.6)
Regional	116 (41.3)	50 (37.3)	46 (43.8)	20 (47.6)
Medical Aid	29 (10.3)	16 (11.9)	10 (9.5)	3 (7.1)
Chi-square Test		x^2=8.974	df=8	p=.345

* = P < .05
df: degree of freedom

Usual source of care (Table 21). 'Hospital/clinic' (48.6%) was indicated as a major source of care in this

study sample followed by 'pharmacy' (22.9%). Those in the category 'none' was also a substantial proportion (12.0%)

There were no statistically significant associations found between 'usual source of care' and Pap history groups.

Table 21. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Usual Source of Care

VARIABLE SOURCE OF CARE	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
None	34 (12.0)	25 (18.3)	6 (5.8)	3 (7.0)
Hospital	138 (48.6)	56 (40.9)	56 (53.9)	26 (60.5)
Health Cen.	19 (6.7)	9 (6.6)	7 (6.7)	3 (7.0)
Traditio.	11 (3.9)	4 (2.9)	5 (4.8)	2 (4.7)
Primary	17 (6.0)	8 (5.8)	7 (6.7)	2 (4.7)
Pharmacy	65 (22.9)	35 (25.6)	23 (22.1)	7 (16.3)
Chi-square Test		x^2=14.395	df=10	p=.156

* = P < .05
df: degree of freedom
Categories: none, hospital/clinic, health center, traditional hospital, primary health care post, and pharmacy

Perceived household economic status (Table 22). The majority of women in the sample perceived that their household economic status was in the 'middle' level (77.5%), while 19.7% of the sample thought they are in the 'low' category.

'Perceived household economic status' did not yield statistical differences among three Pap history groups.

Table 22. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Perceived Household Economic Status

VARIABLE Economic STATUS	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
Low	56 (19.7)	34 (24.8)	15 (14.3)	7 (16.3)
Middle	221 (77.5)	100 (73.0)	88 (83.8)	33 (76.7)
High	8 (2.8)	3 (2.2)	2 (1.9)	3 (7.0)
Chi-square Test		x^2=7.703	df=4	p=.103

* = P < .05
df: degree of freedom

Self-reported health status (Table 23). Most women reported their health status was 'fair' (53.9%) or 'good'(25.4%). About one-fifth of the sample (20.8%), however, felt their health status was 'not good'.

Table 23. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Self-reported Health Status

VARIABLE HEALTH STATUS	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
Not Good	59 (20.8)	32 (23.4)	19 (18.3)	8 (18.6)
Fair	153 (53.9)	73 (53.3)	59 (56.7)	21 (48.8)
Good	72 (25.4)	32 (23.4)	26 (25.0)	14 (32.6)
Chi-square Test		x^2=2.321	df=4	p=.677

* = P < .05
df: degree of freedom

'Self-reported health status' was not a statistically significant variable.

Effort for Health (Table 24). Slightly more women (53.2%) reported that they did not make an 'effort for health' than women who did (46.8%).

Statistical significance was found between 'effort for health' and Pap history groups (x^2=8.677, df=2, p=.013). A somewhat higher proportion in both the 'never' (57.4%) and the 'suspended' (56.2%) groups revealed that they made 'no efforts for their health'. On the other hand, a larger proportion of women in the 'regular' group (67.4%) responded that they did make efforts for their health compared to women in the 'never' group (42.7%) and the 'suspended' group (43.8%).

Table 24. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Effort for Health

VARIABLE EFFORT FOR HEALTH	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
No	151 (53.2)	78 (57.4)	59 (56.2)	14 (32.6)
Yes	133 (46.8)	58 (42.7)	46 (43.8)	29 (67.4)
Chi-square Test		x^2=8.677	df=2	p=.013 *

* = P < .05
df: degree of freedom

Health check-up (Table 25). Just under 40% of the sample (38.2%) did not have a 'health check-up' within the last year before the 1995 survey.

The bivariate analysis revealed a significant difference (x^2=33.309, df=2, p=.000) on 'health check-up'. There were noticeable findings according to Pap history groups. The majority of women in the 'regular' group (74.4%) reported having a 'health check-up' within the period. The 'never' group (25.6%) and the 'suspended' group (39.8%) showed a similar distribution with an inverse outcome from that of the 'regular' group.

Table 25. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Health Check-up

VARIABLE HEALTH CHECK-UP	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
No	175 (61.8)	102 (74.5)	62 (60.2)	11 (25.6)
Yes	108 (38.2)	35 (25.6)	41 (39.8)	32 (74.4)
Chi-square Test		x^2=33.309	df=2	p=.000 *

* = P < .05
df: degree of freedom

Types of health check-up (Table 26). Among women who had a 'health check-up' last year, a 'private health check-

up' (51.6%) was done more frequently than a 'group health check-up' (48.4%).

Table 26. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Types of Health Check-up

VARIABLE TYPES OF CHECK-UP	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total #	95 (100.0)	30 (100.0)	36 (100.0)	29 (100.0)
Group	46 (48.4)	15 (50.0)	20 (55.6)	11 (37.9)
Private	49 (51.6)	15 (50.0)	16 (44.4)	18 (62.1)
Chi-square Test		x^2=2.041	df=2	p=.360

* = P < .05
df: degree of freedom
Total was derived from the subtotal of 'yes' category in a variable of 'health check-up'.

Although there was no statistical difference found in this variable, women in the 'regular' group were the most likely to receive health check-ups in 'private' (62.1%) as compared to the other two groups (50.5% in the 'never' group and 44.4% in the 'suspended' group).

Source of health knowledge (Table 27). 'TV/radio' was the most frequent 'source of health knowledge' (53.9%) in this sample. The category 'neighbors' (13.4%) was the next frequent 'source of health knowledge' followed by 'newspapers' (12.3%). However, one-tenth of women (10.2%) still indicated they had no 'source of health knowledge'.

There was a significantly different association between 'source of health knowledge' and the Pap history groups (x^2=29.403, df=10, p=.001). The 'never' group (46.9%) reported the least dependency on 'TV/Radio' compared to other groups (60.6% in the 'suspended' group and 51.2% in the 'regular' group). In the other categories, women in the 'never' group depended upon 'neighbors' more (19.7%) for their health knowledge than any other category. Women in the 'regular' group stated that health-related articles in newspapers' influenced them more (20.9%) and the source was in the highest proportion in this 'regular' group among the Pap history groups. With regard to women with no source of health knowledge, it can be noted that the 'suspended' group (16.4%) had a higher proportion than the two other Pap

Table 27. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Source of Health Knowledge

VARIABLE SOURCE OF KNOWLEDGE	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
None	29 (10.2)	7 (5.1)	17 (16.4)	5 (11.6)
TV/Radio	153 (53.9)	68 (49.6)	63 (60.6)	22 (51.2)
Neighbors	38 (13.4)	27 (19.7)	7 (6.7)	4 (9.3)
Newspapers	35 (12.3)	14 (10.2)	12 (11.5)	9 (20.9)
Magazines	11 (3.9)	9 (6.6)	. .	2 (4.7)
Books/Poster	18 (6.3)	12 (8.8)	5 (4.8)	1 (2.3)
Chi-square Test		x^2=29.403	df=10	p=.001 *

* = P < .05
df: degree of freedom

history groups (5.1% in the 'never' group and 11.6% in the 'regular' group).

Presence of chronic disease (Table 28). In this study sample, 77.4% of women described having no 'chronic disease' while 22.6% admitted having a 'chronic disease'.

This variable of 'presence of chronic disease' did not attain statistical significance.

Table 28. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Presence of Chronic Disease

VARIABLE CHRONIC DISEASE	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
No	219 (77.4)	103 (75.7)	80 (76.2)	36 (85.7)
Yes	64 (22.6)	33 (24.3)	25 (23.8)	6 (14.3)
Chi-square Test		x^2=1.962	df=2	p=.375

* = P < .05
df: degree of freedom

Religion (Table 29). Among those with 'religion', the biggest religious group was 'buddhism' (38.5%) followed by 'protestant' (20.5%). Those without 'religion' ranked second in the sample with an proportion of 26.2%.

A statistical association between 'religion' and the Pap test history groups was significant (x^2=20.502, df=8, p=.009). The 'never' group (34.6%) indicated women with no

'religion' in the highest proportion among Pap history groups, whereas the 'regular' group (14.0%) showed the lowest proportion in the category. The 'regular' group (55.8%) had a higher proportion of 'buddhism' than the 'never' group and 'suspended' group (43.3% and 29.4%, respectively). The highest proportion of 'protestant' was found in the 'suspended' group (23.1%), while 'Catholic' presented the highest proportion in the 'regular' group (14.0%).

Table 29. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by Religion

VARIABLE RELIGION	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
None	74 (26.2)	47 (34.6)	21 (20.2)	6 (14.0)
Buddhism	109 (38.5)	40 (29.4)	45 (43.3)	24 (55.8)
Protestant	58 (20.5)	27 (19.9)	24 (23.1)	7 (16.3)
Catholic	34 (12.0)	15 (11.0)	13 (12.5)	6 (14.0)
Others	8 (2.8)	7 (5.2)	1 (1.0)	. .
Chi-square Test		x^2=20.502	df=8	p=.009 *

* = P < .05
df: degree of freedom

One's own health insurance (Table 29). A significant percentage of women (74.4%) did not have their own health insurance. It may mean that these women were unemployed.

There was no statistical significance found on this variable.

Table 30. Frequencies, Percentage Distributions, and Bivariate Analysis of Pap Smear Use in Three Groups by One's Own Health Insurance

VARIABLE ONE'S OWN INSURANCE	TOTAL n (%)	NEVER n (%)	SUSPENDED n (%)	REGULAR n (%)
Total	291 (100.0)	137 (100.0)	105 (100.0)	49 (100.0)
No	203 (74.4)	101 (74.8)	72 (75.0)	30 (71.4)
Yes	70 (25.6)	34 (25.2)	24 (25.0)	12 (28.6)
Chi-square Test		x^2=0.225	df=2	p=.894

* = P < .05
df: degree of freedom

Prevalence of Pap smear utilization

The first KHBS in 1989 reported a prevalence rate of only 17% of the Pap smear test utilization among Korean women aged 20-59 within the year prior to the KHBS. In the 1992 KHBS data, 27.9% of women utilized Pap tests (1.64 times of 1989 rate) while the 1995 follow-up data demonstrated a slower rate of increase in the Pap utilization rate of 36.0% (1.29 times of 1992 rate) than the 1989-1992 growth rate. Overall Pap smear utilization increased 2.12 times between 1995 and the 1989 KHBS.

Table 31. The Prevalence of the Pap Smear Utilization by Year

YEAR	PAP RATE	(CHANGE IN RATE)	
1989	17.0%	(1.64 times)	(2.12 times)
1992	27.9%	(1.29 times)	
1995	36.0%		

Predictor Variables for the Usage of the Pap Test

The purpose of this section is to identify meaningful predictor variables among explanatory variables for Pap test utilization by means of logistic regression analysis. The summary results of the logistic regression analysis of Pap testing during the past year of the survey with 12 independent variables are shown in Tables 32 (1992 study) and Table 33 (1995 study). The subquestion of 'type of health check-up' was combined with the 'health check-up' variable because it included very smaller numbers of subjects to obtain meaningful outcome by the logistic regression analysis. The summary results of the logistic regression analysis according to three Pap history groups with 14 independent variables were presented in Tables 34, Table 35, and Table 36. Again, the 'type of health check-up' was combined with the 'health check-up' variable.

However, only significant predictor variables were selected from the original summary tables and presented in all summary tables mentioned above. The original summary tables with other variables with statistical nonsignificance were displayed in the appendix since the length of each table was too long to present in this chapter (see Appendix A, Table 32 - Table 36).

Predictor Variables for Two Groups: Non-user vs. User

This logistic regression analysis was modelled as to the probability of having a Pap test during the year prior to the surveys in 1992 and 1995. As Tables 32 and Table 33 display below, these two models were proven to fit the data well as shown by -2 Log Likelihood Ratio Test (p=0.E+00 in 1992 study; p=3.E-12 in 1995 study), the Score Test (p=0.E+00 in 1992 study; p=6.E-10 in 1995 study), and the Hosmer and Lemeshow Goodness-of-Fit Test (p=0.9686 in 1992 study; p=0.6131 in 1995 study).

1992 study (Table 32). Among 12 independent variables which were entered in the model, seven variables were found to be meaningful predictors of Pap smear use (no/yes) in the 1992 study. Those were: 'age', 'marital status', 'educational status', 'usual source of care', 'perceived

Table 32. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in Korean Women Within the Year Prior to the 1992 KHBS Survey

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Age					
20-29	Reference Group				
30-39	.8299	3.E-05*	2.293	1.559	3.374
40-49	.6377	.0048*	1.892	1.215	2.947
50-59	-.2259	.4211	.798	.460	1.383
Marital Status					
Single	Reference Group				
Married	1.8890	8.E-09*	6.613	3.484	12.552
Others	1.7563	2.E-05*	5.791	2.583	12.984
Educational Status					
None	Reference Group				
Elementary	.4826	.1235	1.620	.877	2.995
Middle	.7056	.0393*	2.025	1.035	3.962
High	.5176	.1457	1.678	.836	3.370
Junior C.	.6531	.1919	1.922	.720	5.125
Above C.	.7686	.0657	2.157	.951	4.890
Usual Source of Care					
None	Reference Group				
Hospital/clinic	.4366	.0072*	1.547	1.126	2.127
Health Center	.9924	.0381*	2.698	1.056	6.892
Traditional H	.5740	.2999	1.775	.600	5.256
Primary Care P	1.1606	.0065*	3.192	1.383	7.365
Pharmacy	-.0371	.8610	.964	.636	1.460
Perceived Household Economic Status					
Low	Reference Group				
Middle	.2117	.1516	1.236	.925	1.650
High	.7881	.0058*	2.199	1.256	3.850
Health Check-Up					
No	Reference Group				
Group	.6564	.0028*	1.928	1.253	2.966
Private	1.1392	1.E-09*	3.124	2.161	4.517
Presence of Chronic Disease					
No	Reference Group				
Yes	.3515	.0266*	1.421	1.042	1.939

Table 32. (Cont.)

* Only statistically significant variables were shown in this table.
Number of Observations: N=1489
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 242.414 with 33 DF (p=0.E+00) : Chi-Square for Covariates
Score = 220.976 with 33 DF (p=0.E+00) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 2.3438 with 8 DF (p=0.9686)

household health status', and 'health check-up' and 'presence of chronic disease'.

Age. 'Age' was found to be a major predictor of Pap test use in the past one year among Korean women. Among the age categories, women in the '30-39' age group (2.3 times) and in the '40-49' age group (2.1 times) had more chances of having the Pap test with statistical significance than women in the '20-29' age group (reference group). However, the '50-59' age group was at risk of not receiving the Pap test, although this was not found to be statistically significant.

Marital status. In the 1992, 'marital status' was revealed as a highly meaningful predictor of Pap test utilization. 'Married' women (6.6 times) and 'others' (5.8 times) were far more likely to receive the Pap test than 'single' women.

Educational status. Among the different categories of 'educational status', only the 'middle' school graduates

category in the 1992 study was statistically significant. In general, higher educated women tended to have a better chance of having had the Pap test than women with no formal education. However, the patterns of associations were inconsistent.

Usual source of care. Women with the 'usual source of care' were more likely to have a Pap test than women with no 'source of care' with the exception of the category of 'others'. Among those categories, 'hospital/clinic', 'health center/health subcenter', and 'primary health care post' were significant sources of care related to the Pap smear test in this 1992 study outcome. The odds of having this test was 3.2 times higher in women with 'primary health care post' care, 2.7 times higher in women with 'health center/health subcenter' care, and 1.5 times higher in 'hospital/clinic' care than in women with no 'source of care'.

Perceived household economic status. Those who perceived their household economic status as 'high' were significant only in 1992. The outcome showed that those who perceived their household economic status as 'high' and 'middle' were 2.2 times and 1.2 times respectively, more likely to have the test than those who perceived they were in the 'low' economic status.

Health check-up. 'Health check-up' was also a very significant predictor variable for Pap test use in 1992.

Those who had had a 'health check-up' revealed having the Pap test more (3.1 times in private and 1.9 times in group) than those who had not had a 'health check-up'. Besides, those who had a 'health check-up' in 'private' tended to have a much higher probability of having the Pap test than those who had a 'health check-up' in a 'group'.

Presence of chronic disease. Women with chronic disease tended to have the Pap test within a year 1.4 times more than women without chronic disease in 1992.

1995 study (Table 33). In 1995, only three variables out of 12 were significant and those were 'marital status', 'usual source of care' and 'health check-up'.

Marital status. 'Marital status' was found to be a meaningful predictor of Pap test utilization in 1995 as well as in 1992. Women in both categories of 'married' (13.4 times) and 'others' (6.1 times) tended to receive the Pap test more than 'single' women did.

Usual source of care. Only the 'hospital/clinic' was found as a statistically significant source of care in the 1995 study with 2.7 times higher chance of having a Pap test than women with no 'usual source of care'. Although other categories were not significant, women who had any 'usual source of care' seemed to have a Pap test more than women with no 'source of care'.

Health check-up. 'Health check-up' was also a strong predictor variable for Pap test use in 1995. Women with a 'health check-up' were more likely to have the Pap test than those without a 'health check-up', 9.2 times

Table 33. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in Korean Women Within the Year Prior to the 1995 Survey

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Marital Status					
Single	Reference Group				
Married	2.5979	7.E-05*	13.436	3.722	48.498
Others	1.8123	.0178*	6.124	1.368	27.417
Usual Source of Care					
None	Reference Group				
Hospital/clinic	1.0099	.0385*	2.745	1.055	7.145
Health Center	.5829	.4243	1.791	.429	7.483
Traditional H	.6445	.4687	1.905	.333	10.889
Primary Care P	.7537	.3032	2.125	.506	8.922
Pharmacy	.5871	.2861	1.799	.612	5.291
Health Check-Up					
No	Reference Group				
Group	1.6089	2.E-05*	4.997	2.402	10.396
Private	2.2154	5.E-11*	9.165	4.727	17.770

* Only statistically significant variables were shown in this table.
Number of Observations: N=404
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 122.375 with 33 DF (p=3.E-12) : Chi-Square for Covariates
Score = 108.210 with 33 DF (p=6.E-10) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 6.3051 with 8 DF (p=0.6131)

higher in a 'private health check-up' and 5.0 times higher in a 'group health check-up'. In addition, a 'private health check-up' was apt to have a much higher impact on having the Pap test than a 'group health check-up'.

Predictor Variables for Three Groups: Never, Suspended, and Regular Groups

Due to technical problems generated by computer software, which were 'information matrix is singular' and 'floating point overflow', four explanatory variables were recategorized for the final model. For 'marital status', 'single' and 'others' were combined into a 'single' category. The category of 'none' was deleted among the categories of 'insurance status'. In 'source of health knowledge', 'magazines and books' were combined into one category. Then, 'others' were omitted from the categories of 'religion'. Those recategorized or omitted variables had zero cells or too small of observations in a cell.

By the -2 Log Likelihood Ratio Test, models for the 'never' group (p=2.E-11) and the 'regular' group (p=0.0405) fitted the data well but the 'suspended' group (p=0.5862). The Score Test, however, showed good fit for the 'never' group (p=3.E-08) while the fit was less good for the 'suspended' group (p=0.7247) and the 'regular' group

(p=0.0796). The Hosmer and Lemeshow Goodness-of-Fit Test showed that those three models shown in Table 34, Table 35, and Table 36 represented good fit.

Never group (Table 34). In order to obtain outcomes for better interpretation, the probability of Korean women ever having a Pap test was contrasted to those who had never had a Pap test. In this 'never' group, 'age', 'marital status', 'health check-up', and 'source of health knowledge' were significant predictors for the probability of Korean women having had a Pap test in their life time.

Age. 'Age' was a significant predictor for the 'never' group, particularly in the '33-42' and '43-52' age categories. Women in the '33-42', '43-52', and '53-62' age categories commonly showed that they were more apt to be Pap users in their lifetime than the reference group, the '23-32' age group. The '33-42' age group had a Pap test 4.1 times more than the reference group followed by the '43-52' age group which had the Pap test 3.1 times more than the reference group.

Marital status. 'Married' women were 5.1 times more apt to obtain a Pap test in their lifetime than 'single' women which is a finding with statistical significance.

Health check-up. 'Health check-up' was a very significant predictor for this 'never' group. There was a 6.3 times higher probability of being a Pap user among those who have had a 'private health check-up', followed by women

with a 'group health check-up' (3.8 times) than those who did not have 'health check-up'.

Table 34. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in the Never Group in 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Age					
23-32	Reference Group				
33-42	1.4122	.0031*	4.105	1.612	10.455
43-52	1.1295	.0276*	3.094	1.133	8.449
53-62	.3112	.6109	1.365	.412	4.527
Marital Status					
Single	Reference Group				
Married	1.6231	.0010*	5.069	1.936	13.273
Health Check-Up					
No	Reference Group				
Group	1.3240	.0167*	3.759	1.271	11.116
Private	1.8385	.0005*	6.287	2.245	17.605
Source of Health Knowledge					
None	Reference Group				
TV/Radio	-1.3663	.0314*	.255	.074	.885
Neighbors	-2.5243	.0006*	.080	.019	.340
Newspapers	-1.5036	.0458*	.222	.051	.972
Magazines/Books	-2.2258	.0073*	.108	.021	.550

* Only statistically significant variables were shown in this table.
Number of Observations: N=276
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 118.935 with 34 DF (p=2.E-11) : Chi-Square for Covariates
Score = 99.035 with 34 DF (p=3.E-08) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 8.0689 with 8 DF (p=0.4268)

Source of health knowledge. All categories of 'source of health knowledge' were found to be statistically significant. Strangely, women with a 'source of health knowledge' tended less to become Pap users than women without 'source of health knowledge'.

Suspended group (Table 35). In this analysis not suspended the Pap test was contrasted to suspended the Pap test. Only one independent variable of 'health check-up' was found as a meaningful predictor for the probability of suspending the Pap test.

Table 35. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in the Suspended Group in 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Health Check-Up					
No	Reference Group				
Group	- .7753	.2216	.461	.133	1.597
Private	-1.5987	.0028*	.202	.071	.577

* Only statistically significant variables were shown in this table.
Number of Observations: N=151
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 31.592 with 34 DF (p=0.5862) : Chi-Square for Covariates
Score = 28.704 with 34 DF (p=0.7247) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 9.0956 with 8 DF (p=0.3343)

Health check-up. Women who had had a 'health check-up' were less likely to suspend the Pap test than women who had not had. 'Private health check-up' tended to provide lower risk of suspending the Pap test with statistical significance than 'group health check-up' in this group.

Regular group (Table 36). In this analysis those not having a regular Pap test was contrasted to those having a regular Pap test. The variable 'health check-up' was found to be the only meaningful predictor for the probability of being regular Pap test users.

Table 36. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in the Regular Group in 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Health Check-Up					
No	Reference Group				
Group	1.6134	.0048*	5.020	1.634	15.421
Private	1.6935	.0012*	5.439	1.947	15.192

* Only statistically significant variables were shown in this table.
Number of Observations: N=272
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 49.655 with 34 DF (p=0.0405) : Chi-Square for Covariates
Score = 46.167 with 34 DF (p=0.0796) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 3.8133 with 8 DF (p=0.8736).

Health check-up. Both 'private' and 'group' health check-up in 'regular' group produced about a 5 times higher probability of being regular Pap users than no 'health check-up' in a fairly similar odds ratio.

Barrier Factors to Pap Smear Test Utilization

The summary results of logistic regression analysis regarding barrier factors of the Pap test utilization are presented in Table 37 to Table 39.

Fits of model to the three groups of data were examined by the Hosmer and Lemeshow Goodness-of-Fit Test (p=0.1023 for the 'never' group, p=0.1483 for the 'suspended' group, and p=0.2177 for 'regular' group). However, the -2 Log Likelihood Ratio Test (p=3.E-07 for the 'never' group and p=0.0188 for the 'suspended' group) and the Score Test (p=7.E-07 for the 'never' group and p=0.0229 for the 'regular' group) showed fit models for the 'never' group and the 'regular' group, but less good fit for the 'suspended' group (p=0.0731 by the -2 Log Likelihood Ratio Test and p=0.0843 by the Score Test).

Never group (Table 37). Among the six barrier factors, 'physician factor' and 'policy factor' were statistically significant for the probability of women who never had a Pap

test in their life time, and 'personal factor' was marginally significant.

'Physician factor' was a predictor for women who had never had a Pap test in 2.3 times higher probability per unit change of factor score than for women had had a Pap test. Although it was not statistically significant,

Table 37. Summary Results of Logistic Regression Analysis for Barrier Factors of Pap Smear Utilization in the Never Group

VARIABLES*	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Characteristics F. **	.2049	.1734	1.227	.914	1.649
Cultural F.	-.5205	.0639	.594	.343	1.031
Personal F.	-.3207	.0534	.726	.523	1.007
Physician F.	.8419	.0001*	2.321	1.507	3.574
Policy F.	-.6323	.0084*	.531	.332	.851
Knowledge F.	-.1201	.6689	.887	.511	1.538

* Variables: F. = Factor.
** Factor of characteristics of a Pap test itself and the procedure.
Number of Observations: N=343
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 40.909 with 6 DF (p=3.E-07) : Chi-Square for Covariates
Score = 38.978 with 6 DF (p=7.E-07) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 13.288 with 8 DF (p=0.1023)

'factor of characteristics of a Pap smear itself and the procedure' was also somewhat more of a barrier among those who never had had a Pap test (1.2 times higher probability per unit change of factor score) than among those who had had one.

On the other hand, the rest of the factors, particularly the significant 'policy factor', were less likely to be associated with barriers for the women who had never had a Pap test.

Suspended group (Table 38). Only 'personal factor' was found to be significantly associated with barriers of Pap test utilization with regard to the probability of women who had suspended the Pap test. Yet, the 'personal factor' was less likely to be a barrier for women who had suspended the

Table 38. Summary Results of Logistic Regression Analysis for Barrier Factors of Pap Smear Utilization in the Suspended Group

VARIABLES*	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	UPPER
Characteristics F. **	-.0182	.9209	.982	.686	1.406
Cultural F.	-.2645	.4250	.768	.401	1.470
Personal F.	-.4470	.0350*	.640	.422	.969
Physician F.	.4752	.1373	1.608	.859	3.011
Policy F.	-.2197	.5428	.803	.396	1.629
Knowledge F.	-.2408	.4806	.786	.403	1.535

Table 38. (Cont.)

```
* Variables: F. = Factor.
** Factor of characteristics of a Pap test itself and the
    procedure.
Number of Observations: N=212
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
    -2 Log L = 11.540 with 6 DF (p=0.0731) : Chi-Square
                                           for Covariates
    Score =    11.134 with 6 DF (p=0.0843) : Chi-Square
                                           for Covariates
    Hosmer and Lemeshow Goodness-of-Fit Test:
         Goodness-of-Fit Statistic = 12.066 with 8 DF
         (p=0.1483)
```

Pap test than for women who had not suspended the Pap test. On the contrary, women with the 'physician factor' were at risk of discontinuing the Pap test with 1.6 times higher probability per unit change of factor score than women who had not suspended the Pap test, although the factor was not statistically significant.

Regular group (Table 39). The significant predictor barrier was 'personal factor' in this group in the model as unit change of factor score in women who had had regular to the probability of having regular Pap tests. The 'personal factor' showed 1.8 times higher probability per Pap tests than in women who had not had regular Pap tests. Although 'physician factor' was not significant, it seemed a barrier for women who had not had regular Pap tests.

Table 39. Summary Results of Logistic Regression Analysis for Barrier Factors of Pap Smear Utilization in the Regular Group

VARIABLES*	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Characteristics F. **	.1283	.5347	1.137	.758	1.705
Cultural F.	.4849	.2020	1.624	.771	3.421
Personal F.	.5875	.0132*	1.799	1.131	2.863
Physician F.	-.2632	.4589	.769	.383	1.542
Policy F.	.1859	.6417	1.204	.550	2.635
Knowledge F.	.2064	.5900	1.229	.580	2.604

* Variables: F. = Factor.
** Factor of characteristics of a Pap test itself and the procedure.
Number of Observations: N=215
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 15.199 with 6 DF (p=0.0188) : Chi-Square for Covariates
Score = 14.682 with 6 DF (p=0.0229) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test: Goodness-of-Fit Statistic = 10.727 with 8 DF (p=0.2177)

Summary of the Chapter

This chapter presented findings of summary statistics in terms of sociodemographic profiles, the predictor variables, and the barrier factors of Pap test utilization in the 1992 and 1995 sample subjects. The summary results were presented as frequency and percentage distributions,

bivariate analyses, and logistic regression analyses with statistically significant associations noted where appropriate.

CHAPTER 5

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter provides a summary of the findings for this study and raises discussions based upon some of the findings. The limitations of the study and the recommendations and conclusions suggested by the study findings are also stated.

Summary

The findings of the 1992 study suggest that the major sociodemographic profiles between Non-users and Users of the Pap smear screening test utilization within the last year prior to the KHBS survey are distinctive. The findings of the 1995 study, however, revealed less distinctive sociodemographic profiles between the same two groups in the Pap smear test compared to the 1992 results. There were no significant differences between non-users and users in 'self-reported health status', 'effort for health', and 'presence of chronic disease' in the 1992 study (3 out of 13 variables), while 'place of residence', 'educational status', 'insurance status', 'perceived household economic status', 'self-reported health status', 'types of health

check-up', 'source of health knowledge', and 'presence of chronic disease' were not statistically significant in 1995 (8 out of 13 variables).

The profile of users in the 1992 sample was that they were better educated, '30-39' aged, 'middle' class, 'married' women, dwelling in 'urban' areas, who had 'regional' and 'industrial' health insurance. Also, they tended to obtain their health knowledge through 'TV/radio' without a 'usual source of care'. They were apt not to have a 'health check-up'; however, if they had one, it would be a voluntary 'individual health check-up'.

On the other hand, the relative profile of non-users compared to users in 1992 was as follows; less educated, '20-29' aged, 'middle' class, 'married', 'urban' residents having 'regional' and 'industrial' health insurance. Unlike Users, if they had a 'health check-up', it tended to be part of a 'group' examination. Other features were similar to the user's except that the phenomena were of weaker associations than those of users. More non-users than users were in the position of being a 'rural' resident of a lower socio-economic class, 'single', having no 'health insurance', no 'usual source of care', not having 'health check-ups', and having no 'source of health knowledge'.

The typical profile of users in the 1995 sample was '33-42' aged, 'married' women using 'hospital/clinic' as

their 'usual source of care'. They tended to 'make efforts for their health' and to have annual 'health check-ups'.

The typical profile of non-users in 1995 was 'married' women, although the '53-62' age group was underrepresented. They were less likely to 'make efforts for their health' and have 'health check-ups'. The non-users of 1995 were primarily 'hospital/clinic' users and followed by 'pharmacy' users.

The profile of the three Pap history groups were not significantly different for the variables of 'place of residence', 'insurance status', 'usual source of care', 'perceived household economic status', 'self-reported health status', 'types of health check-up', 'presence of chronic disease', and 'one's own health insurance' (8 out of 15 variables).

The group differences were found for the variables of 'age', 'marital status', 'educational status', 'effort for health', 'health check-up', 'source of health knowledge', and 'religion'. The typical profile of the women who never had had a Pap test was mostly the '23-32' age group, 'single', making no 'effort for health', having no annual 'health check-up', having health related information through 'TV/radio' and 'neighbors', and without 'religion'. Highly educated women such as 'junior college' graduates and above and women without formal education were also characteristics of the group who had never had a Pap test. The relative

profile of women who have suspended a Pap test were those in the '33-42' and '43-52' age groups, who were also 'married', 'high school' graduates, making no 'effort for health', receiving no 'health check-up', and 'Buddhist'. In addition, they gained health knowledge basically through 'TV/radio' and followed by having no sources. In contrast, the profile of women who had a regular Pap test was age '33-42', 'married', 'high school' graduate, making 'effort for health', having a 'health check-up', having 'TV/radio' and 'newspapers' as a 'source of health knowledge', and buddhist.

The 1992 study identified 'age', 'marital status', 'educational status', 'usual source of care', 'perceived household economic status', 'health check-up', and 'presence of chronic disease' as predictable sociodemographic variables of the usage of the Pap smear screening test within the last year prior to the KHBS survey (7 out of 12 variables). The groups at considerable risk of not participating in the cervical cancer screening program were women of age '20-29', of 'low' class, 'single', who had no formal education, no 'usual source of care', no 'health check-up', and no chronic disease.

The 1995 study, however, indicated only three meaningful predictors, which are 'marital status', 'usual source of care', and 'health check-up' (3 out of 12 variables) within the year prior to filling out the 1995

follow-up survey. Those who might be at risk by not having a Pap smear screening test were 'single' women, women without a 'usual source of care', and women who did not have a 'health check-up'.

Considering the women's life time experiences upon Pap test utilization behavior, 'age', 'marital status', 'health check-up', and 'source of health knowledge' were predictors (4 out of 14 variables). Those who were at risk of not having had a Pap test in their life time were women in the '23-32' age, 'single' status, with no annual 'health check-up'. Strangely, those who had a source of health knowledge were at risk of not having a Pap test in their life time.

With respect to women's suspension behavior on the Pap test utilization, 'health check-up' was the only significant predictor (1 out of 14 variables). Following one or more Pap smear test, no 'health check-up' was an important factor for discontinuing the test.

With regard to compliant behavior indicated by annual Pap smear tests for the three years prior to the 1995 survey, only 'health check-up' was a meaningful predictor (1 out of 14 variables). Those who did not have a 'health check-up' were at risk of not being regular Pap users.

Among the barrier factors, the conclusive factor for Korean women's initiation of the Pap test in their lifetime was the 'physician factor'. Unpleasant doctors' attitudes and unclear communication influenced Korean women's behavior

with regard to whether or not they would begin the Pap smear screening test. Furthermore, the presence of doctors' recommendations for the Pap test and the consistency among doctors regarding the recommended testing interval were important to induce Pap smear test usage.

An additional barrier might be the 'factor of characteristics of a Pap smear itself and the procedure' to having a Pap test. This is due to fear of the results, the posture and undressed status required to take the test, and the potential discomfort or pain caused by the test.

After women had once experienced a Pap smear test, the 'physician factor' still seems to be a potential and suspicious barrier for the decision to continue or discontinue the Pap test. The 'personal factor', which was the only statistically significant barrier factor in relation to the suspension behavior, was not perceived as a barrier for those who have suspended the Pap smear test.

However, the 'personal factor', such as busy schedules, forgetfulness, perceived low risk status for cervical cancer, and previous personal experiences of gynecological visits, played a significant negative role for those who continue to be a regular Pap user. Additionally, the 'cultural factor' may continue to act as a background barrier. Korean women, who are predisposed unfavorably towards a western type of medicine of gynecological examination, would want to avoid a gynecological visit if at

all possible. Their prevention behavior such as regular health examinations and preference to doctors' gender also imply this barrier factor.

Discussion

The comparison of findings on sociodemographic profiles and predictable variables between the 1992 and 1995 studies revealed inevitable differences. Moreover, in order to match subjects between the 1992 and 1995 studies, the selected three stable variables, 'age', 'marital status', and 'educational status' showed differences in two of those variables of 'age' and 'educational status'. Yet, it is not conclusive concerning where the differences originated.

One-third of the 1992 sample was not possible to trace in 1995 and another one-third of the sample simply did not respond. The non-traceable 1992 sample was not surprising as the total internal migration rate in Korea for the whole country was 22.0% in both in-migration and out-migration in 1990 (National Statistical Office, 1992). Nevertheless, it can not be doubted that the sample of the 1995 follow-up study is the subsample of the 1992 sample, as all of the 1992 sample was followed up by their names, addresses, names of household heads, and phone numbers in 1995.

Women in the '43-52' age category responded more in 1995 than in the 1992, and women in the category of 'none' in 'educational status' were less represented in 1995 compared to 1992, therefore statistical differences were found on these two variables. However, when the '43-52' age category and the category of 'none' in 'educational status' were deleted from analysis, the statistically significant differences between 1992 and 1995 sample were not found (see Appendix C).

The small sample size of the 1995 study may have had an impact upon the results. However, the reasons for the differences among the sociodemographic profiles and predictors between the 1992 and 1995 samples may be sought in other sources of information such as the real changes in the Korean society related to time.

The variable of 'place of residence' was not revealed to be important for Pap test utilization for Korean women in this study. However, reasons for the different outcomes on the significant differences between non-users and users was only found in the 1992 group and, not in 1995 group. This could be interpreted in relation to expanded urbanization and overall development in Korea during the time period. The urban area expanded as seen by the growth of the urban population from 57.3% in 1980 to 74.4% in 1990 (National Statistical Office, 1993). Hence, geographically and socially, the distance and/or distinction between the urban

and rural areas may have been narrowed through merging old rural areas into new urban areas, the expansion of the road system, building more health care facilities in rural areas, increasing automobile ownership in rural populations and so on. The difference between 1992 and the 1995 on this variable could reflect meaningful differences or actual changes which occurred in Korea within the three years. In the near future, 'place of residence' might not influence health related utilization in Korea except in very remote areas or islands. An additional explanation is that the small sample in 1995 may have obliterated the possible effect of 'place of residence'.

Most studies conducted in the U.S. and Kim's study (1977) carried out in Korea suggested that older women were more likely than younger women to be at higher risk for not having the Pap test. Those results were usually derived from bivariate analysis and at different times since the last Pap test. Studies in Korea by Choo (1988), Kim S-D (1988) and Lee et al. (1986), however, produced contrary results. The present study is not consistent with the previous findings of older women being at higher risk. The present results, based on having a Pap test within the past year and during the life time, were generated by means of adjusted logistic regression analysis. Overall, the youngest age groups (20-29 or 23-32 ages) seemed to be at risk of not having the Pap test regardless of the time frame. On the

contrary, the middle aged groups (33-42 and 43-52) tended to be the groups at risk of discontinuation of the Pap test. The statistical nonsignificance in the 1995 study might be caused by the small sample size or by adjustment of other variables such as marital status. Yet, the findings of this study seem to make sense in the Korean situation generally, because women in younger age groups are apt to be single. In Korea, the mean age at first marriage for women has continuously increased since 1960 and reported as 25.5 years in urban areas and 25.2 years in rural areas in 1990 (National Statistical Office, 1993). Moreover, women who are having active sexual lives, mostly married women, and in child-bearing ages are more likely to have a chance to initiate the Pap test and therefore are in a position to make the decision to discontinue the test after once having started.

There were no controversial findings among this study and other study results on marital status and the at risk groups. Although many studies found the age factor as a strong, if not the strongest, predictor of the Pap smear screening, for Korean women marital status seemed to play the central role for usage of the Pap smear test. Because Korean culture does not accept sexual activity before marriage, single, that is never-married, women would be at the highest risk of not having the Pap test in Korea. Moreover, being a single woman implies being a virgin in

Korea and this is emphasized by the fact that there is a Korean word for single meaning virgin (Dong-A's Editorial Department, 1983; Lee et al.,1989). Culturally acceptable visits to an obstetrician or a gynecologist would start only at the time when a Korean woman needs to see a doctor due to a pregnancy after marriage. After the age of natural cessation of child-bearing or post-menopausal, such as women over 50 years of age, Korean women would tend to think of visiting an obstetrician or gynecologist as unnecessary. This would explain why the subjects of ages 50-59 or 53-62 in this study were shown to be in the second place in ranks of underusing the Pap test. Also these groups may be less informed.

Divorced or widowed women may find it easier and more acceptable to meet with an obstetrician or gynecologist because they once started sexual activity within the socially approved circumstances. Thus, as shown in the study results on marital status, the divorced/widowed women's status was a significant predictor of having had the Pap test during the last year prior to the survey. Choi (1990) mentioned that the rate of the Pap test among single women in Korea could not help being low due to the nature of the test. Among Kim's study sample (1977), female college students were intentionally excluded from a question concerning the practice of the Pap test. Other studies

conducted in Korea did not even include single women in the study samples with the exception of the KHBS.

Few studies addressed cultural factors which may work as barriers against the use of the Pap test (Harlan et al., 1991; Lunt, 1984) without a detailed explanation about it. The factor of culturally acceptable status for sexual activity is a key to this variable and Pap test utilization in Korea. Consequently, married non-users should be target for Pap utilization behavior in Korea, because they have fewer cultural reasons for not doing so.

Although the study results in 1992 on educational status were significant, the pattern was neither directly correlated nor inversely correlated, and Kim et al. (1988) reported a similar phenomenon. 'Educational status' was a nonsignificant predictor of having had a recent Pap test in Sawyer et al.'s study (1990) as well as in the findings of the 1995 study. Harlan et al., (1991), however, reported that the less educated women had a lower probability of receiving the Pap screening test. Throughout this study 'educational status' was not shown to be of an important variable.

Possible speculation on this issue is that 'educational status' would not work alone for Pap smear utilization behavior in Korea. Rather it might play a role strongly connected to the 'economic status', particularly to the class culture. Women with no or lower education could be

influenced by the lower class culture which may lead to a different, that is relatively liberal, sexual life and early onset of sexual activity compared to main stream middle class women. In other words, highly educated, middle-class or upper middle-class women would be more likely to adhere to Korea's cultural mores. One reason for the apparent lack of educational status may be related to the mass media's coverage, TV in particular, of the development and expansion of different health related programs.

Insurance status did not affect the Pap smear status in the Korean studies (Kim et al., 1988; Lee et al., 1986) with the present research included, while research in the U.S. presented a significant effect of insurance status on the test (Kirkman-Liff et al., 1992). This discrepancy may be due to whether or not the Pap test was covered by health insurance and what the price was. The Pap smear screening test was not covered by health insurance in Korea. There were exceptions, such as health prevention projects administered to women who had civil servants' and private school employees' insurance, and industrial establishment health insurance. However, only a limited number of women benefitted from these projects because of the age limitations (over 35 years or over 40 years) or the number of planned beneficiaries (Korean Medical Insurance Corporation, 1993; Health Insurance Union, 1992). Yet, the cost of the Pap test covered by health insurance was not

substantial: the maximum was less than $9. Hence, health insurance status may not be an important factor for the Pap test in Korea as supported by the studies mentioned above. Rather, economic status would be a more influencing factor to the Pap test for the Korean women, even though Kim S-D's study (1988) indicated no influence of the economic status to the action of having a Pap test.

For the household economic status variable, the respondents' self-perceived status was utilized instead of real household income in this study. It was found that 61.3% - 62.5% of Koreans perceived themselves to belong to the middle class (National Statistical Office, 1994; Korea Institute for Women Development, 1991). In this study, the perception increased from 58.8% in 1992 to 77.9% in 1995. Thus, questions for a cross-check between self-perceived household economic status and actual household income would be necessary to identify the target group at risk of the Pap screening test in the Korean case. Household economic status in this study could not be used to predict overall behavior related to the Pap test and this finding was supported by Kim S-D's study (1988).

Surprisingly, for this secondary preventive health behavior, of which the Pap smear screening test is an example, the utilization was not meaningfully related to the variables of 'self-reported health status', 'effort for health', and 'presence of chronic disease' in this study.

The underlying assumptions for choosing these variables seem to be negated by the results. That is, women who already have a chronic disease or whose health status is not good would be more likely to visit health care facilities and/or make an effort for their health improvement including preventive measures as they may be more cautious about their health. Korean women in Kim's study (1992) reported that the reason for taking the first Pap test was questionable symptoms (44.5%) followed by the self-concern about health (39.7%).

The 'health check-up' variable was a highly significant predictor of Pap smear test usage and a majority of Users reported having had a voluntary 'private health check-up' in the present study no matter how long the consideration period was (one year prior to the survey or routine or life time). This finding raised a question as to whether or not this health check-up was working alone or was intertwined with other variables. The expense of the private health check-up is not only quite high in Korea but is also not covered by health insurance. Thus, only women whose economic status is high and women with specific motives to have the health check-up voluntarily can afford it in Korea. Yet, not all women who work outside the home and who can obtain an annual group health check-up from their company, would undergo the check-up. A report by the Korean Ministry

of Labor (1992) showed that the health examination rate was 88.4% in 1992.

The present study supports previous works regarding the importance of having a 'usual source of care' on the Pap smear screening (Harlan et al., 1991; Kirkman-Liff et al., 1992). Among those who had a 'usual source of care', the source with an individual doctor was a significant category. Those sources related were the western health care system such as 'hospital/clinic', 'health center', and 'primary health care post' in 1992 and only 'hospital/clinic' in 1995. The reasons of that change may be similar to the speculated case of 'place of residence'.

The surprising finding was that 'primary health care post' operated by licensed midwives in small or isolated rural areas was the most significant category when compared to other sources for Pap users in 1992. Since medical doctors are the only ones who can legally conduct the Pap smear test in Korea, but in actual practice, nurses or self sometimes preform the test, the users of the 'primary health care post' might have responded incorrectly. Presumably, they might use self-test kits for the Pap smear screening and then examine the results in the health center with the aid of the midwives.

Another alternative explanation would be health projects run by several universities in rural areas in Korea. If cervical cancer control programs were included in

those projects, the village health workers and the midwives would have acted as intermediaries in them. Therefore, the process could have created confusion for women residing the rural areas. They may not have known if it was the primary health care post or health center that was their usual source of care, thus confounding their answers on questionnaires.

Mass media exposure was indicated by a few studies (Choi, 1990; Kim S-D, 1988) as a relatively good way to decrease the risk of not having had the Pap test. However, this study did not show evidence to support that idea in general, except for prediction of the discontinuation of the Pap test. Strangely enough, women who have had a 'source of health knowledge' were at risk of never having a Pap test. The likely explanation might be the negative influence of the health knowledge creating fear and leading to an imagined worst case scenario of the disease process. Many women might tend to remember selectively, most likely the negative scenario. However, in one Korean study, one of the reasons (third rank, 18.1%) for having the reexamination with the Pap test was by suggestion of family and close neighbors (Kim, 1992). If closer friends and neighbors were predisposed positively towards the Pap test, the related conversation among them was more likely to conducive to the Pap test (Kim et al., 1988).

Religion did not affect Pap test utilization behavior in this study and it was supported by the findings in the study by Kim et al. (1988). Kim (1984) reported that the consistent association between disease and religion was not shown in studies conducted in Korea. Additionally, unlike other countries, Korean female Catholics showed the highest practice of contraception followed by Buddhists. Kim's reflection on these aspects was that Koreans seemed to have been influenced more by cultural customs than by the teachings of each religion.

Although occupation was a very important variable which influenced the action of having a Pap test in Kim et al.'s study (1988), this study's findings did not agree with their findings. However, employment status, such as 'in the labor force' and 'not in the labor force', did not show any effect in terms of the adjusted odds ratio for all variables including 'never had a Pap smear' and also 'not having a Pap smear in past year' in Calle et al.'s study (1993). Caution should be used when interpreting Kim et al's study (1988). Their study area was one small rural area and most of the women fell into the category of no occupation or agriculture.

In the present study, composite scores were formed to measure Cronbach's Alpha and the logistic regression analysis for barrier factors. The majority of studies did not even refer to the gold standard or their standard points

of the coefficient alpha for satisfactory/unsatisfactory or lower/higher or weaker/stronger etc. Nunnally (1967) suggested a minimum above the .50 of the alpha and .65 or greater by Abramson (1994) and Cronbach (1951). Others regarded the adequate score of the coefficient as at least .70 in early stages of instrument development and at least .80 for a more developed instrument (Ferketich, 1990). According to Nunnally (1978), if the number of items are changed, the alpha coefficient can be increased. In addition, it was considered that obtaining very high alpha coefficients are difficult in development stage (Ferketich, 1990). The items used in this study were relatively heterogeneous as the selected theoretical barrier factors covered a relatively vast range. With all of these circumstances, the coefficient alpha for the total of .69 and the range of alpha scores of the six barrier factors of .37-.52 seem to be acceptable for this study.

The 'physician factor' and 'personal factor' were noted as significant barrier factors in this study. To initiate the Pap test, physician's attitude, communication skill, and recommendation related to the Pap test were barriers. This factor was also a barrier for discontinuation of the Pap test, although it was not statistically significant. Kim's corresponding finding (1992) was that recommendation of the health institution was a second important reason for the Pap retest. Harlan et al. (1991) also indicated that no

recommendation by doctor resulted in women not complying with the test.

For the regular Pap test, women's busy schedules, previous experience, perceived ineligibility, and forgetfulness were barriers, and Kim (1992) supported this finding based on the 'personal busy schedule' and 'not remembering the reexamination date' as reasons for non-compliance with the reexamination for the Pap test. This barrier factor was also a barrier for women who did not even suspend the Pap test in this study. Besides, 'policy factor' appeared as a barrier for women who had once had a Pap test. However, surprisingly the 'factor of characteristics of Pap smear itself and the procedure' and 'cultural factor' did not emerge as statistically significant. This may be due to small sample size for analysis and/or nature of the factor developed.

Limitations

Relative to the ideal information for a cervical cancer control program, several limitations are associated with this study.

First, measurements utilized in this study followed the ones in the KHBS including the definitions, classifications, coding keys and so on. As the KHBS operated as a kind of

surveillance system, the content of the study instrument was not in great detail but broadly covered a range of health behaviors. Therefore, it was not designed specifically to focus on Pap smear screening behaviors.

Second, the KHBS was not originally developed as a longitudinal study. Thus, following up the 1992 KHBS sample in 1995 was problematic, and consequently, the sample size in the 1995 follow-up study was smaller than the 1992 sample.

Third, women over 60 were not included in the original design.

Fourth, the KHBS sample underrepresented women aged 20-29 (26.1% in the sample vs. 35.4% in the Census), and single women aged 20-29 (13.8% in the sample vs. 19.4% in the Census). Conversely, women aged 50-59 (21.6% in the sample vs. 15.6% in the Census), others (9.0% in the sample vs. 7.1% in the Census), women with no education (9.2% in the sample vs. 5.3% in the Census), and women with junior college graduates (9.2% in the sample vs. 5.3% in the Census) were overrepresented in this study sample.

Fifth, although there was an additional question related to women's employment status in the 1995 follow-up study, this intention for the change did not seem to be fulfilled. The originally designed question on occupation was changed by the suggestion of Korean researchers from 'occupation' to 'one's own health insurance' as a measure of

women's employment status. The purpose of substitute question was to attain the impact of employment status which might have been an important stimulus for having the Pap screening by reason of regular health check-ups arranged through the workplace. When women's occupation was asked, the answers were confusing. Those women who fell in the same category would respond with no occupation or professional homemaker, or agriculture, or a visiting maid or naming their part time job and so fourth which did not meet the intention of this question. In 1988, the proportion of female laborers in the Korean labor market was 40.7% of which 75.5% were married (Korea Institute for Women Development, 1991). Yet, only 25.6% of the 1995 sample had their own health insurance.

Lastly, the items on barrier factors were merely based on literature, perhaps proper for Western society; these may not be perfectly relevant to Korean women and their situations. A sizeable number of women did not fill out the section concerning barrier factors.

Recommendations for Further Research

The findings of this study suggest that further complementary research is essential.

First, studies focussing on the significant barriers and suspicious barriers should be investigated with more depth and clearer definition on each barrier factor. Qualitative study methodology on barrier factors may be a very valuable research tool for the purpose. For example, a focused group study for target women, and delphi method targeting experts or health care personnel or scholars in the field, perhaps considering the various groups individually or together.

Second, identifying the characteristics of physicians that might influence Pap smear screening test utilization behavior would be useful. For instance, demographic characteristics of the physicians who performed the Pap test, their belief in screening effectiveness, the ideal interval for Pap test recommendation, their attitude towards preventive care visits such as the Pap smear test, contents of communication with their patients, and sources where they get new information about this issue and so on.

Third, reasons of discontinuation of the Pap test should be determined using specifically more delicate and detailed measurements.

Lastly, both culturally and socially appropriate method and measurements in Korean circumstances should be designed for future studies in relation to this topic.

Recommendations for Practice

Several recommendations for practice can be drawn from the findings of this study:

First, the diffusion of the practice of having an annual health check-up which would include routine Pap testing to a wider female population, particularly married women, by means of changed insurance policies, would be effective.

Second, mandatory routine Pap smear screening tests should be offered for women in sexually associated occupations regardless their marital status.

Third, spreading correct health knowledge through the mass media could give women positive inspiration toward Pap utilization behavior. The attitude of those potential Pap users should be changed by the source including gender bias in both directions, favorable and unfavorable. Of course, suitable communication networks for face to face communication should be developed for Korean women, most likely through doctor's offices, church groups, school systems, at least in the high school and college levels.

Fourth, continuing education for physicians in order to provide awareness and a cue to action concerning the importance of their positive professional attitude/behavior, communication skills, desirable patient-doctor relationship and morality seems inevitable. In this way they could have

a stronger positive effect on secondary health prevention behavior of their patients with regard to cervical cancer. Physician continuing education could be offered in medical schools, training hospitals, and periodical re-training sessions. For instance, a Pap smear itself is more likely to be part of the physicians' daily work or routine; otherwise, it may be a first if not uncommon experience for the patient.

Lastly, as soon as Korean women are married, physicians in any specialty field must be prepared to recommend them to start a Pap test and then remind them to have a routine Pap test. They possibly are able to use personalized reminder cards or invitation postcards managed by a computerized system. For the patients, a VCR could be also used in waiting rooms for the purpose of preparing women for approaching or future Pap smear tests.

Concluding Remark

Coleman et al. (1993) remarked that those obstacles which are related to 'factor of characteristics of Pap smear itself and the procedure' and the 'cultural factor' are very difficult to remove. The findings of this study did not show the anticipated problems linked to the cultural and social obstructions to be overcome. Therefore, the work of

health care workers in Korea faced with improving the use of Pap test screening will be a less formidable task.

APPENDIX A

TABLES

Table 32. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in Korean Women Within the Year Prior to the 1992 KHBS

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Place of Residence					
Urban	Reference Group				
Rural	-.2374	.1338	.789	.578	1.076
Age					
20-29	Reference Group				
30-39	.8299	3.E-05*	2.293	1.559	3.374
40-49	.6377	.0048*	1.892	1.215	2.947
50-59	-.2259	.4211	.798	.460	1.383
Marital Status					
Single	Reference Group				
Married	1.8890	8.E-09*	6.613	3.484	12.552
Others	1.7563	2.E-05*	5.791	2.583	12.984
Educational Status					
None	Reference Group				
Elementary	.4826	.1235	1.620	.877	2.995
Middle	.7056	.0393*	2.025	1.035	3.962
High	.5176	.1457	1.678	.836	3.370
Junior C.	.6531	.1919	1.922	.720	5.125
Above C.	.7686	.0657	2.157	.951	4.890
Insurance Status					
None	Reference Group				
Civil	.3724	.3777	1.451	.635	3.319
Industrial	.5573	.1198	1.746	.865	3.524
Regional	.4175	.2351	1.518	.762	3.024
Medical Aid	.2544	.5893	1.290	.512	3.247
Usual Source of Care					
None	Reference Group				
Hospital/clinic	.4366	.0072*	1.547	1.126	2.127
Health Center	.9924	.0381*	2.698	1.056	6.892
Traditional H	.5740	.2999	1.775	.600	5.256
Primary Care P	1.1606	.0065*	3.192	1.383	7.365
Pharmacy	-.0371	.8610	.964	.636	1.460

Table 32. (Cont.)

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Perceived Household Economic Status					
Low	Reference Group				
Middle	.2117	.1516	1.236	.925	1.650
High	.7881	.0058*	2.199	1.256	3.850
Self-Reported Health Status					
Not Good	Reference Group				
Fair	-.1451	.4495	.865	.594	1.260
Good	-.0667	.7226	.935	.647	1.352
Effort For Health					
No	Reference Group				
Yes	-.0103	.9390	.990	.760	1.289
Health Check-Up					
No	Reference Group				
Group	.6564	.0028*	1.928	1.253	2.966
Private	1.1392	1.E-09*	3.124	2.161	4.517
Source of Knowledge					
None	Reference Group				
TV/Radio	.0855	.6858	1.089	.720	1.648
Neighbors	.0448	.8695	1.046	.613	1.784
Newspapers	.4698	.1188	1.600	.886	2.887
Magazines	.5881	.1912	1.801	.745	4.349
Books/Posters	.2559	.3813	1.292	.728	2.291
Presence of Chronic Disease					
No	Reference Group				
Yes	.3515	.0266*	1.421	1.042	1.939

Number of Observations: N=1489
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 242.414 with 33 DF (p=0.E+00) : Chi-Square for Covariates
Score = 220.976 with 33 DF (p=0.E+00) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 2.3438 with 8 DF (p=0.9686)

Table 33. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in Korean Women Within the Year Prior to the 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Place of Residence					
Urban	Reference Group				
Rural	-.0923	.7680	.912	.494	1.683
Age					
23-32	Reference Group				
33-42	.2345	.5552	1.264	.580	2.756
43-52	-.2498	.5695	.779	.329	1.842
53-62	-.5181	.3143	.596	.217	1.634
Marital Status					
Single	Reference Group				
Married	2.5979	7.E-05*	13.436	3.722	48.498
Others	1.8123	.0178*	6.124	1.368	27.417
Educational Status					
None	Reference Group				
Elementary	.2970	.6691	1.346	.345	5.255
Middle	.8370	.2489	2.309	.557	9.581
High	1.0099	.1696	2.745	.650	11.601
Junior C.	.6909	.4673	1.996	.310	12.857
Above C.	.1732	.8507	1.189	.196	7.222
Insurance Status					
None	Reference Group				
Civil	-.0915	.9209	.913	.150	5.553
Industrial	-.5001	.5742	.606	.106	3.470
Regional	-.5479	.5256	.578	.107	3.138
Medical Aid	-.0560	.9512	.946	.157	5.691
Usual Source of Care					
None	Reference Group				
Hospital/clinic	1.0099	.0385*	2.745	1.055	7.145
Health Center	.5829	.4243	1.791	.429	7.483
Traditional H	.6445	.4687	1.905	.333	10.889
Primary Care P	.7537	.3032	2.125	.506	8.922
Pharmacy	.5871	.2861	1.799	.612	5.291

Table 33. (Cont.)

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Perceived Household Economic Status					
Low	Reference Group				
Middle	-.3974	.2585	.672	.337	1.339
High	-.3723	.6401	.689	.145	3.281
Self-Reported Health Status					
Not Good	Reference Group				
Fair	.1836	.6344	1.201	.564	2.560
Good	-.0522	.9085	.949	.390	2.312
Effort For Health					
No	Reference Group				
Yes	.2360	.3900	1.266	.739	2.169
Health Check-Up					
No	Reference Group				
Group	1.6089	2.E-05*	4.997	2.402	10.396
Private	2.2154	5.E-11*	9.165	4.727	17.770
Source of Knowledge					
None	Reference Group				
TV/Radio	-.5157	.2625	.597	.242	1.472
Neighbors	-.1988	.7072	.820	.290	2.313
Newspapers	-.2907	.6107	.748	.244	2.290
Magazines	-.5568	.5306	.573	.101	3.265
Books/Posters	-.6660	.3771	.514	.117	2.252
Presence of Chronic Disease					
No	Reference Group				
Yes	-.3921	.2683	.676	.337	1.353

Number of Observations: N=404
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 122.375 with 33 DF (p=3.E-12) : Chi-Square for Covariates
Score = 108.210 with 33 DF (p=6.E-10) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 6.3051 with 8 DF (p=0.6131)

Table 34. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in the Never Group in 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Place of Residence					
Urban	Reference Group				
Rural	-.4967	.2292	.609	.271	1.367
Age					
23-32	Reference Group				
33-42	1.4122	.0031*	4.105	1.612	10.455
43-52	1.1295	.0276*	3.094	1.133	8.449
53-62	.3112	.6109	1.365	.412	4.527
Marital Status					
Single	Reference Group				
Married	1.6231	.0010*	5.069	1.936	13.273
Educational Status					
None	Reference Group				
Elementary	-1.2686	.1657	.281	.047	1.691
Middle	-1.0130	.2857	.363	.057	2.332
High	- .6606	.4907	.517	.079	3.381
Junior C.	-1.6748	.1387	.187	.020	1.720
Above C.	-1.7463	.1194	.174	.019	1.571
Insurance Status					
Medical Aid	Reference Group				
Civil	.3319	.6239	1.394	.370	5.253
Industrial	- .0487	.9359	.952	.291	3.118
Regional	.3561	.5403	1.428	.457	4.463
Usual Source of Care					
None	Reference Group				
Hospital	.9058	.0714	2.474	.924	6.624
Health Center	1.6854	.0573	5.395	.949	30.669
Traditional H	1.5918	.1046	4.913	.718	33.593
Primary Care P	.2874	.7377	1.333	.248	7.167
Pharmacy	.9368	.1016	2.552	.831	7.833
Perceived Household Economic Status					
Low	Reference Group				
Middle	.7313	.0864	2.078	.901	4.794
High	1.6812	.1348	5.372	.593	48.644

Table 34. (Cont.)

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Self-Reported Health Status					
Not Good	Reference Group				
Fair	.6168	.2184	1.853	.694	4.948
Good	.9986	.1100	2.715	.798	9.236
Effort For Health					
No	Reference Group				
Yes	.0034	.9924	1.003	.497	2.024
Health Check-Up					
No	Reference Group				
Group	1.3240	.0167*	3.759	1.271	11.116
Private	1.8385	.0005*	6.287	2.245	17.605
Source of Health Knowledge					
None	Reference Group				
TV/Radio	-1.3663	.0314*	.255	.074	.885
Neighbors	-2.5243	.0006*	.080	.019	.340
Newspapers	-1.5036	.0458*	.222	.051	.972
Magazines/Books	-2.2258	.0073*	.108	.021	.550
Presence of Chronic Disease					
No	Reference Group				
Yes	.5346	.2889	1.707	.635	4.584
Religion					
None	Reference Group				
Buddhism	.6722	.1011	1.959	.877	4.374
Protestant	.6491	.1708	1.914	.756	4.844
Catholic	.4893	.4342	1.631	.479	5.560
One's Own Health Insurance					
No	Reference Group				
Yes	.3992	.3448	1.491	.651	3.412

Number of Observations: N=276
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 118.935 with 34 DF (p=2.E-11) : Chi-Square for Covariates
Score = 99.035 with 34 DF (p=3.E-08) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 8.0689 with 8 DF (p=0.4268)

Table 35. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in the Suspended Group in 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Place of Residence					
Urban	Reference Group				
Rural	- .0254	.9620	.975	.343	2.774
Age					
23-32	Reference Group				
33-42	.5609	.4016	1.752	.472	6.498
43-52	1.0080	.1566	2.740	.679	11.051
53-62	.2528	.7737	1.288	.230	7.213
Marital Status					
Single	Reference Group				
Married	-.0730	.9245	.930	.206	4.204
Educational Status					
None	Reference Group				
Elementary	- .9694	.4557	.379	.030	4.843
Middle	-1.6629	.2082	.190	.014	2.526
High	-1.4170	.2697	.242	.020	3.002
Junior C.	- .8060	.6294	.447	.017	11.798
Above C.	- .9754	.5324	.377	.018	8.057
Insurance Status					
Medical Aid	Reference Group				
Civil	-.6009	.3234	.548	.166	1.807
Industrial	-.3865	.5040	.679	.219	2.111
Regional	-.6086	.4766	.544	.102	2.908
Usual Source of Care					
None	Reference Group				
Hospital	.9561	.2226	2.602	.560	12.094
Health Center	- .0713	.9459	.931	.119	7.302
Traditional H	.9551	.4705	2.599	.194	34.776
Primary Care P	.9864	.4514	2.682	.206	34.932
Pharmacy	1.0977	.2244	2.997	.510	17.613
Perceived Household Economic Status					
Low	Reference Group				
Middle	.0784	.9067	1.082	.291	4.015
High	-1.3457	.3193	.260	.018	3.679

Table 35. (Cont.)

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Self-Reported Health Status					
Not Good	Reference Group				
Fair	.3283	.6447	1.389	.344	5.604
Good	.3835	.6420	1.467	.291	7.391
Effort For Health					
No	Reference Group				
Yes	- .6183	.1580	.539	.228	1.271
Health Check-Up					
No	Reference Group				
Group	- .7753	.2216	.461	.133	1.597
Private	-1.5987	.0028*	.202	.071	.577
Source of Knowledge					
None	Reference Group				
TV/Radio	-1.2246	.1813	.294	.049	1.770
Neighbors	- .3379	.5931	.713	.207	2.463
Newspapers	- .3660	.6471	.693	.145	3.324
Magazines/books	-1.2164	.2323	.296	.040	2.180
Presence of Chronic Disease					
No	Reference Group				
Yes	.7088	.2576	2.032	.595	6.932
Religion					
None	Reference Group				
Buddhism	.4530	.3807	1.573	.571	4.331
Protestant	.6122	.3310	1.845	.537	6.338
Catholic	.8101	.3255	2.248	.447	11.301
One's Own Health Insurance					
No	Reference Group				
Yes	-.0377	.9422	.963	.348	2.667

Number of Observations: N=151
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 31.591 with 34 DF (p=0.5862) : Chi-Square for Covariates
Score = 28.704 with 34 DF (p=0.7247) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 9.0956 with 8 DF (p=0.3343)

Table 36. Summary Results of Logistic Regression Analysis for Major Sociodemographic Characteristics of Pap Smear Use in the Regular Group in 1995 Study

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Place of Residence					
Urban	Reference Group				
Rural	-.2312	.6542	.794	.289	2.183
Age					
23-32	Reference Group				
33-42	1.1132	.0971	3.044	.817	11.341
43-52	.5670	.4480	1.763	.408	7.626
53-62	.9631	.2598	2.620	.491	13.990
Marital Status					
Single	Reference Group				
Married	1.0090	.1744	2.743	.640	11.763
Educational Status					
None	Reference Group				
Elementary	.4317	.7311	1.540	.131	18.061
Middle	1.0065	.4240	2.736	.232	32.268
High	1.0482	.4073	2.853	.239	34.037
Junior C.	.7829	.6182	2.188	.101	47.550
Above C.	.4907	.7389	1.634	.091	29.253
Insurance Status					
Medical Aid	Reference Group				
Civil	- .0417	.9618	.959	.174	5.276
Industrial	- .1738	.8348	.840	.164	4.302
Regional	.3784	.6345	1.460	.307	6.948
Usual Source of Care					
None	Reference Group				
Hospital	.4645	.5411	1.591	.359	7.058
Health Center	.8430	.4689	2.323	.237	22.753
Traditional H	1.1527	.3757	3.167	.247	40.568
Primary Care P	.3783	.7407	1.460	.155	13.727
Pharmacy	.6087	.4646	1.838	.360	9.395
Perceived Household Economic Status					
Low	Reference Group				
Middle	- .1418	.8061	.868	.280	2.692
High	.3621	.7475	1.436	.158	13.022

Table 36. (Cont.)

VARIABLES	PARAMETER ESTIMATE	P VALUE (CHI-SQ)	ODDS RATIO	95% CI LOWER	95% CI UPPER
Self-Reported Health Status					
Not Good	Reference Group				
Fair	- .5815	.3706	.559	.157	1.996
Good	- .1842	.8031	.832	.196	3.539
Effort For Health					
No	Reference Group				
Yes	.1732	.6861	1.189	.513	2.755
Health Check-Up					
No	Reference Group				
Group	1.6134	.0048*	5.020	1.634	15.421
Private	1.6935	.0012*	5.439	1.947	15.192
Source of Knowledge					
None	Reference Group				
TV/Radio	.2433	.7214	1.275	.335	4.858
Neighbors	- .3254	.7113	.722	.129	4.047
Newspapers	.2184	.7841	1.244	.261	5.934
Magazines	- .1230	.8998	.884	.130	5.994
Presence of Chronic Disease					
No	Reference Group				
Yes	- .8886	.1550	.411	.121	1.400
Religion					
None	Reference Group				
Buddhism	.8877	.0945	2.429	.858	6.877
Protestant	.5266	.4073	1.693	.487	5.883
Catholic	.0611	.9366	1.063	.236	4.789
One's Own Health Insurance					
No	Reference Group				
Yes	.4979	.2845	1.645	.661	4.095

Number of Observations: N=272
CI: Confidence Intervals
Criteria for Assessing Model Fit: * = P < .05
-2 Log L = 49.655 with 34 DF (p=0.0405) : Chi-Square for Covariates
Score = 46.167 with 34 DF (p=0.0796) : Chi-Square for Covariates
Hosmer and Lemeshow Goodness-of-Fit Test:
Goodness-of-Fit Statistic = 3.8133 with 8 DF (p=0.8736).

APPENDIX B

QUESTIONNAIRE

I. Please fill out this questionnaire (Please circle only one).

1. Age	2. Marital Status	3. Educational Status	4. Religion	5. Health Insurance Status
Actual Age _____ Date of Birth ___/___/___	1. Single 2. Married 3. Divorced 4. Widowed 5. Other _____	1. None 2. Elementary School 3. Middle School 4. High School 5. Junior College 6. Above College	1. None 2. Buddhism 3. Catholic 4. Protestant 5. Other _____	1. None 2. Civil Servants and Private School Employed 3. Industrial Established Health Insurance 4. Regional Health Insurance 5. Medical Aid Program

6. Perceived Household Economic Status	7. Usual Source of Care	8. Self-reported Health Status
1. Low 2. Middle 3. High	1. None 2. Hospital/Clinic 3. Health Center/Health Subcenter 4. Korean Traditional Hospital 5. Primary Health Care Post 6. Pharmacy 7. Others _____	1. Not Good 2. Fair 3. Good

9. Effort for Your Health	10. Health Check-up	11. Kind of Health Check-up	12. One's Own Health Insurance	13. Presence of Chronic Disease
1. No 2. Yes	1. No 2. Yes	1. Group 2. Private	1. No 2. Yes	1. No 2. Yes

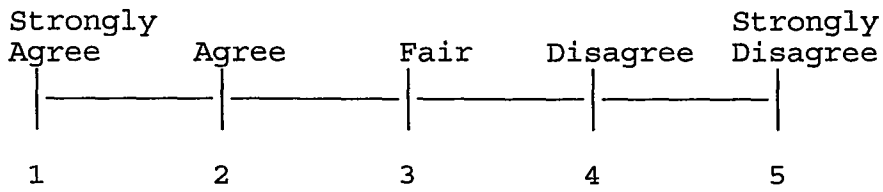
14. Usual Source of Health Knowledge		
1. None	2. TV/radio	3. Neighbors
4. Newspapers	5. Magazines	6. Books/posters

II. Please circle your answer to the statements below.

1.	No	Yes	Have you ever had a Pap test?
2.	No	Yes	Have you had a Pap test within the last year prior to this survey?
3.	No	Yes	Have you had one or more Pap tests in your lifetime, but suspended.
4.	No	Yes	Have you had annual Pap tests within the last three years prior to this survey?
5.	No	Yes	Have you had a total hysterectomy?
6.	No	Yes	Have you been diagnosed as a cervical cancer patient?
7.	No	Yes	Have you had your last Pap test because of symptoms in your genital tract?

III. Please circle one number among five scale levels that is closest to what you think.

Example:



Questions	Answers
1. I hesitate to have a Pap test because of fear of the results.	1 2 3 4 5
2. I would feel ashamed if I had to undergo a Pap test because of the posture and state of dress required for the test.	1 2 3 4 5
3. I am afraid of the pain or discomfort the test would produce.	1 2 3 4 5
4. I do not mind taking the Pap test by either female or male doctors.	1 2 3 4 5
5. I prefer to seek advice from doctors of indigenous medicine as they do not touch my body and also I do not need to be undressed even for my gynecologic problems.	1 2 3 4 5
6. I want to see a gynecologist, only when I am pregnant.	1 2 3 4 5
7. I try to see a doctor no matter what I am sick or not.	1 2 3 4 5
8. I was not interested in cervical cancer or the Pap test.	1 2 3 4 5
9. My culture makes me hesitate having gynecologic exams.	1 2 3 4 5

Questions	Answers
10. I am too busy to take time off from work at home or at office for a Pap test.	1 2 3 4 5
11. I would easily forget to have a Pap test unless someone reminds me to get it.	1 2 3 4 5
12. I did not feel like I can get the disease.	1 2 3 4 5
13. If I found a good doctor with good skills, I would get a Pap test.	1 2 3 4 5
14. There are medical institutions near here to have a Pap test.	1 2 3 4 5
15. I do not need a Pap test If my the previous result is normal.	1 2 3 4 5
16. Only women who have been or sexually active now should have a Pap test.	1 2 3 4 5
17. I have no problem of cervical cancer unless I have a symptom.	1 2 3 4 5
18. I think that a Pap test is recommended for me.	1 2 3 4 5
19. The cost of a Pap test should be covered by health insurance.	1 2 3 4 5
20. The successful treatment of cervical cancer is possible if a diagnosis made early.	1 2 3 4 5
21. I usually have had positive experiences in my previous gynecology visits.	1 2 3 4 5

Questions	Answers
22. My doctor did not recommend a Pap test.	1 2 3 4 5
23. It was required to wait too long to have a Pap test.	1 2 3 4 5
24. The recommended interval for having a Pap test is too frequent.	1 2 3 4 5
25. The doctor's attitude was unpleasant when I had gynecologic visit.	1 2 3 4 5
26. The cost of a Pap smear test is inexpensive to get one.	1 2 3 4 5
27. The doctor gives me a clear direction or communication for procedure of gynecologic exams.	1 2 3 4 5
28. I was confused as recommendation for a regular Pap test was not consistent according to the doctors.	1 2 3 4 5
29. Administrative processes in medical institutions are too complicated and complex to get a Pap test.	1 2 3 4 5
30. Pap test is taking a specimen from my cervix.	1 2 3 4 5
31. The Pap test can detect precancerous change of cervical cancer.	1 2 3 4 5
32. Annual Pap test is necessary.	1 2 3 4 5

APPENDIX C

Test Table. Frequency, Percentage Distributions, and Bivariate Analysis of Two Study Samples by Age and Educational Status

Variable	Total	1992 Sample	1995 Sample
Age			
Total	1504(100.0)	1201(100.0)	303(100.0)
20-29	485 (32.3)	391 (32.6)	94 (31.0)
30-39	618 (41.1)	484 (40.3)	134 (44.2)
40-49	Deleted		
50-59	401 (26.7)	326 (27.1)	75 (24.8)
Chi-square Test	x^2=1.602	df=2	p=.449
Educational Status			
Total	1764(100.0)	1365(100.0)	399(100.0)
None	Deleted		
Elementary	457 (25.9)	352 (25.8)	105 (26.3)
Middle	359 (20.4)	273 (20.0)	86 (21.6)
High	698 (39.6)	549 (40.2)	149 (37.3)
Junior C.	93 (5.3)	62 (4.5)	31 (7.8)
Above C.	157 (8.9)	129 (9.5)	28 (7.0)
Chi-square Test	x^2=9.198	df=4	p=.056

APPENDIX D

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