RESEARCH ARTICLE

Having Private Cancer Insurance in Korea: Gender Differences

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Abstract

Background: As coverage of public insurance is not sufficient to cover diagnosis or treatment of cancer, having private health insurance is important to prepare for unexpected expenses of cancer. The purpose of this study was to assess factors associated with having private cancer insurance, considering gender among the socio-demographic factors and health behavior. Materials and Methods: We used data from the 2011 Korea Health Panel, which included 10,871 participants aged 20 years and older. Socio-demographics, health behavior, and perceived cancer risk were the independent variables and having private cancer insurance was the dependent variable. Multivariable logistic regression analysis was used to identify factors associated with having private cancer insurance. Results: The variables relating to middle age, higher education, higher household income, married men, and the perceived cancer risk groups of 1-10% and 11-30% were significantly associated with having private cancer insurance. Additionally, females who had private non-cancer health insurance were positively associated with the dependent variables (OR=1.36; 95% CI=1.17-1.57). Education, smoking status, exercise, and perceived cancer risk possibility were significantly associated with having private cancer insurance only among women. The men lowered the overall percentages of those having private cancer insurance (OR=0.53, 95% CI=0.45-0.63). Conclusions: We found that there were significant differences between men and women who had private cancer insurance. Women with private cancer insurance are more likely to follow precautionary health behavior than men. This could be interpreted as resulting from masculine ideologies. It is important to make males recognize the seriousness of the cancer risk. In general, household income was highly associated with private cancer insurance. These results reveal an inequity among the buyers of private cancer insurance in terms of economic status level, education level, and health condition.

Keywords: Private cancer insurance - perceived cancer risk - gender differences - Korea

Introduction

Cancer is a leading cause of death around world. The incidence rate of cancer is increasing based on the demographics of an aging population, and risk factors such as health behaviors associated with urbanization and economic development (Torre et al., 2015). In Korea, 28.8% of the deaths in 2013 were caused by cancer (Statistics Korea, 2014). It was the highest death rate ever in Korea. This rate increased by 14.4% over the period 2003 to 2012. Additionally, during 2000 to 2010, the economic burden of cancer increased from $11,424 to $20,858, with an average annual growth rate of 8.9% (Lee et al., 2015). As a result, the Korean government has expanded health insurance coverage for cancer including decreasing out-of-pocket payments (Lee and Shaw, 2014; Kim and Kwon, 2015). The out-of-pocket expenditure on cancer has dropped around 30% and this number has been maintained from 2007 to 2010 (You et al., 2013).

The Korean public health expenditure was 55.5% of its health expenditure in 2014, whereas the country average of those in the Organization for Economic Co-operation and Development (OECD) was 72.6% in 2013 (Organization for Economic Co-operation and Development, 2015). Although the Korean expenditure was lower than the average, cancer medical expenditure, however, is still very expensive for most individuals; it is a huge financial burden for patients. A previous research report stated that in 2012, 62.7% of patients spent over six million won (approximately 5,235 USD) for cancer treatment, and 19.6% spent over 20 million won (approximately 17,448 USD) (Kim et al., 2012).

National health insurance in Korea offers universal health coverage. However, many people purchase private health insurance because of the low coverage of the national health insurance. Private health insurance in Korea is supplemental health coverage. The rate of individuals with private health insurance in Korea was

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78% in 2009 and this percentage has been increasing (Cho, 2013). There are several studies that identify factors associated with having private health insurance; the main associated factors are income, education level, and age (Lim et al., 2007; Yoo et al., 2012).

However, there has not yet been a study around private cancer insurance that includes cancer diagnosis or cancer treatment. In identifying the factors associated with private cancer health insurance, we took note of gender differences. In general, women experience poorer health conditions than men (Denton et al., 2004), and as a result, they visit and/or seek out health professionals more than men (Galdas et al., 2005). Specifically, faced with the potential of breast and cervical cancer, women considered cancer prevention more than men. Moreover, women are more likely to have private cancer insurance than men. However, in Korea, women's income, the main factor associated with having private health insurance, is not higher than men. The labor force participation rate of women ages 15 to 64 in Korea was 54.5% in 2010

Table 1. General Characteristics of Study Variables at 2011

		Total (N=10,871)		Having private cancer insurance (N=2,430)		No private cancer insurance (N=8,441)		P-value
		N	%	N	%	N	%	
Age	20-29	1,120	10.3	101	1	1,019	9.4	<.001
	30-39	2,017	18.6	471	4	1,546	14.2	
	40-49	2,402	22.1	763	7	1,639	15.1	
	50-59	1,968	18.1	661	6	1,307	12.0	
	60-69	1,781	16.4	372	3	1,409	13.0	
	≥70	1,583	14.6	62	1	1,521	14.0	
Gender	Female	5,851	53.8	1,526	14	4,325	39.8	<.001
	Male	5,020	46.2	904	8	4,116	37.9	
Residential region	Rural	6,055	55.7	1,280	12	4,775	43.9	<.001
	Urban	3,193	29.4	732	7	2,461	22.6	
	Capital	1,623	14.9	418	4	1,205	11.1	
Education	≤ Elementary school	2,377	21.9	334	3	2,043	18.8	<.001
	Middle school	1,237	11.4	291	3	946	8.7	
	High school	3,464	31.9	940	9	2,524	23.2	
	≥ College	3,793	34.9	865	8	2,928	26.9	
Marital status	Single or separated or divorced	2,915	26.8	381	4	2,534	23.3	<.001
	Married	7,956	73.2	2,049	19	5,907	54.3	
Economic activity status	No	4,138	38.1	793	7	3,345	30.8	<.001
	Yes	6,733	61.9	1,637	15	5,096	31.3	
Household income	Low	1,638	15.1	169	2	1,469	13.5	<.001
	Middle-low	2,066	19.0	389	4	1,677	15.4	
	Middle	2,296	21.1	478	4	1,818	16.7	
	Middle-high	2,431	22.4	655	6	1,776	16.3	
	High	2,440	22.4	739	7	1,701	15.6	
Smoking status	Never	6,665	61.3	1,664	15	5,001	46.0	<.001
	Former smoker	1,762	16.2	327	3	1,435	13.2	
	Smoker	2,444	22.5	439	4	2,005	18.4	
Alcohol consumption	Never	2,469	22.7	488	4	1,981	18.2	0.005
	1 time a month	3,589	33.0	838	8	2,751	25.3	
	2-3 times a week	1,348	12.4	316	3	1,032	9.5	
	1 or more times a week	3,465	31.9	788	7	2,677	24.6	
Exercise	Never	6,642	61.1	1,413	13	5,229	48.1	0.018
	1 time a month	1,415	13.0	345	3	1,070	9.8	
	2-3 times a week	1,290	11.9	308	3	982	9.0	
	5-6 times a week	984	9.1	239	2	745	6.9	
	Everyday	540	5.0	125	1	415	3.8	
Chronic disease status	No	4,276	39.3	985	9	3,291	30.3	0.169
	Yes	6,595	60.7	1,445	13	5,150	47.4	
Self-rated health	Bad	1,513	13.9	251	2	1,262	11.6	<.001
	Normal	4,446	40.9	1,051	10	3,395	31.2	
	Good	4,912	45.2	1,128	10	3,784	34.8	
Having private non-cancer health insurance	No	3,936	36.2	557	5	3,379	31.1	<.001
	Yes	6,935	63.8	1,873	17	5,062	46.6	
Perceived cancer risk possibility following 10 year(%)	0	4,179	38.4	824	8	3,355	30.9	<.001
	1-10	2,436	22.4	574	5	1,862	17.1	
	11-30	2,324	21.4	578	5	1,746	16.1	
	≥31	1,932	17.8	454	4	1,478	13.6	
Cancer screening experience in the recent three years	No	7,340	67.5	1,421	13	5,919	54.4	<.001
	Yes	3,531	32.5	1,009	9	2,522	23.2	

(OECD, 2012). Therefore, in this study, those having private cancer insurance will be assessed while looking at gender differences, considering income, and perceived risk of cancer. The objective of this study is to investigate the factors associated with having private cancer insurance.

Materials and Methods

Study population

We used 2011 Korea Health Panel data from the Korea Institute for Health and Social Affairs (KIHSA) and the National Health Insurance Service (NHIS). The Korea Health Panel selected samples with a method of 2-stage cluster and researched all members of the selected households to secure representation. The data provides healthcare utilization, expenditure on health, demographics, and health behaviors of families and individuals. Its strength is that it is a nationally representative sample. Since the variable, perception of cancer risk, was only included in the 2011 data, we used just 2011 data. The individuals included numbered 17,037 in the 2011 baseline data. A total of 10,871 subjects were used after excluding for those aged under 20 (N=4,089), subjects with cancer (N=657), as well as missing data (N=1,422).

The Korea Health Panel was approved by the National Statistical Office and all individual data was guaranteed anonymity. The raw data are an open source and anyone who wants to use the data can acquire the data set from the Korea Health Panel website (www.khp.re.kr) through an application procedure.

Dependent variable

Having private cancer insurance was the dependent variable. It was captured by the question that asked, "What kind of private health insurance do you have?" Responses were categorized as "General sickness insurance," "Cancer insurance," "Accident insurance," "Long-term care insurance," "Annuity or whole life insurance," or "Others."

Independent variables

Age (20-29, 30-39, 40-49, 50-59, 60-69, ≥70), residential region (rural, urban, metropolitan), education (elementary school or lower, middle school, high school, college or higher), marital status (single, separated, divorced, or married), economic activity status (yes or no), and household income were included as socio-demographic variables. Household income was calculated by dividing the household monthly income by the square root of the household size (Deaton and Lubotsky, 2003).

As health behavior variables, smoking status (never, former smoker, or smoker), alcohol consumption (never, one time a month, two-three times a week, or one or more times a week), and exercise (never, one time a month, two-three times a week, or five-six times a week) were included.

Chronic disease status (yes or no), self-rated health (bad, normal, or good), having private non-cancer health insurance (yes or no), and the percentage of the perceived cancer risk possibility in the next 10 years (0%, 1-10%,

Table 2. Results of Multiple Logistic Regression for having Private Cancer Insurance

	OR	95% CI
Age		
20-29	1.00	
30-39	2.70	(2.10-3.48)
40-49	4.05	(3.12-5.25)
50-59	4.70	(3.57-6.19)
60-69	3.14	(2.33-4.22)
≥70	0.69	(0.47-1.01)
Gender		
Female	1.00	
Male	0.54	(0.46-0.64)
Residential region		
Rural	1.00	
Urban	1.05	(0.94-1.17)
Capital	1.17	(1.02-1.34)
Education		
≤ Elementary school	1.00	
Middle school	1.13	(0.93-1.37)
High school	1.28	(1.07-1.53)
≥ College	1.24	(1.02-1.51)
Marital status		
Single or separated or divorced	1.00	
Married	1.25	(1.08-1.44)
Economic activity status		
No	1.00	
Yes	1.02	(0.91-1.15)
Household income		
Low	1.00	
Middle-low	1.31	(1.07-1.62)
Middle	1.27	(1.03-1.56)
Middle-high	1.67	(1.36-2.06)
High	1.86	(1.50-2.3)
Smoking status		
Never	1.00	
Former smoker	0.95	(0.79-1.15)
Smoker	0.88	(0.74-1.06)
Alcohol consumption		
Never	1.00	
1 time a month	1.08	(0.94-1.24)
2-3 times a week	1.12	(0.94-1.34)
1 or more times a week	1.15	(0.98-1.34)
Exercise		
Never	1.00	
1 time a month	1.03	(0.89-1.19)
2-3 times a week	1.02	(0.88-1.18)
5-6 times a week	1.03	(0.87-1.22)
Everyday	1.15	(0.92-1.44)
Chronic disease status		
No	1.00	
Yes	1.02	(0.91-1.14)
Self-rated health	Bad 1.00	
Normal	1.18	(0.99-1.39)
Good	1.14	(0.97-1.36)
Having private non-cancer health insurance		
No	1.00	
Yes	1.34	(1.19-1.51)
Perceived cancer risk possibility following 10 year(%)		
0	1.00	
1-10	1.13	(0.99-1.29)
11-30	1.19	(1.04-1.35)
≥31	1.08	(0.94-1.25)
Cancer screening experience in the recent three years		
No	1.00	
Yes	1.24	(1.12-1.38)

11-30%, 31% or greater) were also included in the study. In terms of having private non-cancer health insurance: if subjects answered no, they did not have any private health insurance. If they answered yes, subjects had one or more private non-cancer health insurance. Non-cancer health insurance indicated all private health insurance except private cancer insurance. The perceived risk of cancer in the next 10 years was captured by the question "How do you assess your cancer risk over the next 10 years?" The answer to this was a continuous percentage divided into 0%, 1-10%, 11-30%, or 31% or greater.

Statistical analysis

The distribution of the general characteristics was analyzed by the chi-square test. Multiple logistic regression was used to identify the factors associated with having private cancer insurance. All the independent variables were adjusted in the regression model. The significance level was 0.05. All statistical analyses were conducted using SAS 9.3 (SAS Institute Inc., Cary, NC, USA).

Results

Table 1 lists the general characteristics in the study. The total sample size was 10,871. Of this, 2,430 (22.4%)

Table 3. Subgroup Analysis for Having Private Cancer Insurance by Gender

		Female		Male	
		OR	95% CI	OR	95% CI
Age	20-29	1.00		1.00	
	30-39	3.18	(2.33-4.33)	1.76	(1.11-2.77)
	40-49	4.34	(3.14-6.00)	2.86	(1.80-4.54)
	50-59	5.20	(3.68-7.36)	3.12	(1.93-5.07)
	60-69	3.41	(2.34-4.96)	2.09	(1.25-3.49)
	≥70	0.82	(0.52-1.31)	0.34	(0.16-0.70)
Residential region	Rural	1.00		1.00	
	Urban	1.07	(0.93-1.24)	1.02	(0.86-1.21)
	Capital	1.16	(0.97-1.38)	1.20	(0.97-1.49)
Education	≤ Elementary school	1.00		1.00	
	Middle school	1.33	(1.06-1.68)	0.86	(0.60-1.23)
	High school	1.39	(1.11-1.75)	1.16	(0.86-1.58)
	≥ College	1.36	(1.05-1.76)	1.06	(0.77-1.47)
Marital status	Single or separated or divorced	1.00		1.00	
	Married	1.08	(0.91-1.28)	1.74	(1.33-2.29)
Economic activity status	No	1.00		1.00	
	Yes	0.96	(0.84-1.09)	1.21	(0.92-1.59)
Household income	Low	1.00		1.00	
	Middle-low	1.29	(0.99-1.65)	1.41	(0.94-2.12)
	Middle	1.10	(0.85-1.41)	1.65	(1.10-2.46)
	Middle-high	1.43	(1.11-1.84)	2.21	(1.49-3.29)
	High	1.57	(1.21-2.03)	2.52	(1.69-3.75)
Smoking status	Never	1.00		1.00	
	Former smoker	0.71	(0.42-1.18)	1.06	(0.85-1.32)
	Smoker	0.62	(0.39-0.98)	0.97	(0.79-1.19)
Alcohol consumption	Never	1.00		1.00	
	1 time a month	1.06	(0.91-1.24)	1.18	(0.85-1.64)
	2-3 times a week	1.06	(0.85-1.32)	1.27	(0.89-1.80)
	1 or more times a week	1.18	(0.97-1.44)	1.19	(0.88-1.62)
Exercise	Never	1.00		1.00	
	1 time a month	1.23	(1.01-1.50)	0.85	(0.69-1.06)
	2-3 times a week	0.96	(0.78-1.18)	1.07	(0.85-1.33)
	5-6 times a week	1.09	(0.87-1.36)	0.98	(0.76-1.25)
	Everyday	1.17	(0.86-1.60)	1.16	(0.84-1.60)
Chronic disease status	No	1.00		1.00	
	Yes	1.07	(0.92-1.25)	0.96	(0.81-1.13)
Self-rated health	Bad	1.00		1.00	
	Normal	1.09	(0.89-1.33)	1.33	(0.96-1.85)
	Good	1.13	(0.92-1.39)	1.19	(0.86-1.65)
Having private non-cancer health insurance	No	1.00		1.00	
	Yes	1.34	(1.15-1.55)	1.26	(1.04-1.53)
Perceived cancer risk possibility following 10 year(%)	0	1.00		1.00	
	1-10	1.27	(1.08-1.51)	0.95	(0.77-1.16)
	11-30	1.22	(1.03-1.43)	1.12	(0.91-1.38)
	≥31	1.04	(0.87-1.25)	1.12	(0.90-1.39)
Cancer screening experience in the recent three years	No	1.00		1.00	
	Yes	1.29	(1.13-1.48)	1.18	(0.99-1.40)

subjects had private cancer insurance and 8,441(77.6%) did not. All the independent variables, except for chronic disease status, were significantly related to having private cancer insurance.

Table 2 shows the results of the multiple logistic regression. We found that women were likely to have private cancer insurance more than men (OR=0.54, 95% CI=0.46-0.64), meaning; and, participants who were middle aged were more likely to have private cancer insurance. Higher education and higher household income were significantly related with having private cancer insurance. Health behavior, such as smoking status, alcohol consumption, exercise, chronic disease status, and self-rated health were not significantly related. Subjects who had private non-cancer health insurance were positively associated with also having private cancer insurance (OR=1.34; 95% CI=1.19-1.51). Perceived cancer risk was partly significantly associated with having private cancer insurance. Compared to those who answered that their perceived cancer risk was 0%, those who answered that their perceived cancer risk was 1-10% or 11-30%, were more likely to have private cancer insurance.

Table 3 shows the results of the subgroup analysis by gender. Education, smoking status, exercise, cancer screening experience, and perceived cancer risk possibility were significantly associated with having private cancer insurance only among women (i.e., not men). On the other hand, marital status was significantly associated with having private cancer insurance (OR=1.74; 95% CI=1.33-2.29) only among men. As for the association of household income, having private non-cancer health insurance, and age with having private cancer insurance, these were almost same for both men and women.

Discussion

In this study, we identified the factors associated with having private cancer insurance. Age, household income, marital status, having private non-cancer health insurance, and perceived cancer risk were identified as factors associated with having private cancer insurance.

Remarkable results were derived from the subgroup results by gender. Although perceived cancer risk is related to the likelihood of better health behaviors (Rogers and Mewborn, 1976), it was statistically significant in relation to private cancer insurance among only women. The perceived cancer risk is a strong motivation for precautionary health behavior (Abotchie and Shokar, 2009; Cullati et al., 2009). It was associated with participating in cancer screening (Goldman and Risica, 2004; Kim et al., 2014), and risk-reducing activities (Katapodi et al., 2004). As a previous study indicated (Kim et al., 2014), precautionary health behavior, such as cancer screening, appears to be associated with increased likelihood of perceiving cancer risk, resulting in an inverted U-shaped relationship between extremely low or extremely high perceived cancer risk.

The results from the women show that women prepare for cancer. Women generally considered the risks of cervical cancer and/or breast cancer (Kash et al., 1995), and made use of medical services more than men (Ladwig

et al., 2000). In addition, preventive care utilization, such as medical check-ups, was higher among women than men (Vaidya et al., 2012). Previous studies reported that reasons for women's high medical utilization included being responsible for managing their family's health and having the female hormone estrogen (Oksuzyan et al., 2008).

In addition, although statistically significant in only women, health behavior factors, such as smoking status and exercise, were also associated with having private cancer insurance.

In contrast, a previous study reported that men's low medical utilization was due to socialization of masculine ideologies, and men were more likely to seek help after disease onset (Galdas et al., 2005). Even men that are highly educated and perceive their cancer risk as high did not purchase private cancer insurance according to this study.

Overall, a high perceived cancer risk was not significant in any group. This may relate to the fact that Korean private health insurance companies use underwriters when someone purchases private health insurance. Although chronic disease status and self-rated health were not associated with having private cancer insurance, having private non-cancer health insurance, which was able to represent the subject's health condition, was significantly associated with these. A poor health condition was negatively associated with having private health insurance (Huh and Kim, 2009; Kiil, 2012; Yoo et al., 2012). This implies that there is risk selection in the Korean insurance industry (Shin, 2012). Household income was highly associated with having private cancer insurance. The high-income group can purchase private cancer insurance, and thereby reduce the financial burden of healthcare expenditures. However, the low-income group cannot. These results indicate that there is an inequity among the buyers of private cancer insurance in terms of economic status level, education level, and health condition.

A previous study (Weyh et al., 2015) showed that uninsured patients, without cancer insurance, had a greater tendency for prolonged hospital stays. This could reflect their general lack of preventive care, increased use of tobacco and alcohol, along with more advanced disease, and delays in initiating treatment. Therefore, policy makers should be aware of the importance of administering primary cancer prevention to uninsured individuals without cancer insurance.

There are strengths and limitations to this study. The strength of this study is that the data are representative of the general population. Therefore, the results can be generalized to the Korean population as a whole. A limitation of the study is that its design is as a cross-sectional study. The results are not causal effects. Second, there are many types of private cancer insurance, but we were not able to distinguish these and thus just focused on whether or not the subject was insured. Third, we could not fully exclude the effects of information bias as the measurement of all variables included in this study was based on a self-reported questionnaire survey using open source data from KHPS 2009 to 2011.

For further study, researchers should conduct analysis using detailed private cancer insurance data and longitudinal data. Additionally, the effects of private health insurance on healthcare utilization and expenditures should be identified. These are still in debate in Korea (Kang et al., 2005; Lee et al., 2010; Shin, 2012; Jeon and Kwon, 2013). Policy makers should consider gender differences and the inequity in private health insurance and private cancer insurance. It is important to make male to recognize the seriousness of the cancer risk. The inequity in healthcare utilization is still a problem in Korea (Lee et al., 2015; Park, 2015). Finally, as cancer insurance coverage and health policy continue to change over time, it is necessary to consider the environment of health policy and economic circumstances.

Acknowledgements

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