

Appropriate Information System to Improve Cancer Screening Coverage of Stomach Cancer

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Abstract

This study is to develop appropriate information system to improve cancer screening coverage of stomach cancer. The subjects consisted of 186 subjects who have visited in a general hospital located in Metropolitan area from February 8 to April 27, 2016. According to marital status, the odds ratio of married respondents showed significantly higher difference 2.39 times than single respondents on screening test of stomach cancer (OR=2.39, 95% CI=1.52-6.23). Therefore, this studies will be conducted to evaluate the effectiveness of information system and the impact. This change of the information system will have a technique on prevention of stomach cancer over time.

Keywords: *Information system, Screening, Coverage, Stomach cancer, Technique*

1. Introduction

Stomach cancer is a common cancer in Korea, however the number of people diagnosed has been falling. It is rare in people under 50 years of age and affects more men than women. In 2011 over 3,000 new cases of stomach cancer were diagnosed in Korea. Stomach cancer affects nearly twice as many men as women. The risk of being diagnosed with stomach cancer by age 95 in 1 in 71 for men compared to 1 in 237 for women. In 2011, there were 2,129 deaths due to stomach cancer in Korea. There is no routine screening test for stomach cancer [1],[2].

Gastrofiberscopy as well as roentgenologic examination of stomach, is now considered to be one of the indispensable diagnostic methods of gastric diseases. In general, it is agreed that the roentgenologic examination is convenient for observation of shape, contour, motor function and gross lesions of stomach while gastrofiberscopy is especially valuable in detection of mucosal changes or small lesions of stomach [3],[4].

Cancer screening rates in the United States continue to fall short of national goals according to a new report from the Centers for Disease Control and Prevention. Screening among Asian and Hispanic ethnic groups is particularly poor [5],[6]. As information technology has been developed for accessing information resources, information systems have become information application model, evaluating the performance for application service provider becomes important.

Therefore, this is to develop appropriate information system to improve cancer screening coverage of stomach cancer. The result is likely to provide useful guidelines for the successful application service provider.

Article history:

Received (July 19, 2016), Review Result (September 24, 2016), Accepted (October 27, 2016)

2. Related researches

2.1. Predictive modeling technology

Fig. 1 shows information management systems to improve cancer screening. The design of medical technology system is as follows. 1) planning phase : construction of medical technology system 2) intermittent phase : input, stratege, process, analysis, application 3) final phase : verifying study, impact, usability of system.

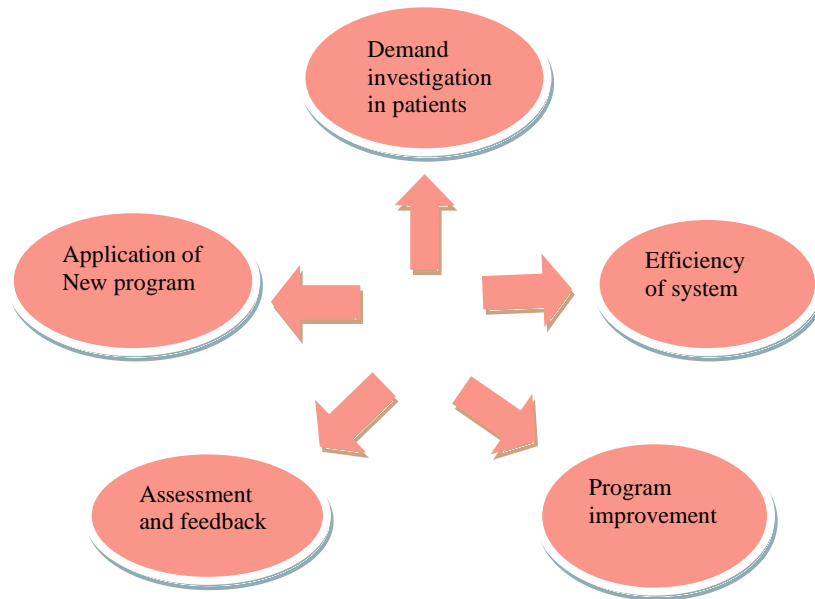


Figure 1. Information management systems to improve stomach cancer screening

2.2. Materials

This paper was performed clinical assessment using information system setted in each dimension, in order to evaluate the course and each item, and to suggest improvements at the end of the evaluation. Health promotion of gastric cancer patients using the education of information system was classified into five dimensions: teaching, application, discussion, evaluation, and others. The subjects consisted of 186 subjects who have visited in a general hospital located in Metropolitan area from February 8 through April 27, 2016.

2.3 Methods

Sociodemographic variables and physical status of subjects were measured by percentage and number. The chi-square test was used for the examination of the sociodemographic variables in gastric patients between two groups. In addition, the chi-square test was performed the difference of health status on screening intention. On the other hand, the odds ratio of cancer screening according to patients' characteristics and health status was performed.

3. Results

3.1. Difference of sociodemographic variables on screening intention

Table 1 presents difference of sociodemographic variables on screening intention. For marital status, married respondents who had an intention on screening test of stomach cancer were significantly higher than married respondents who didn't have an intention on screening test of stomach cancer ($X^2=0.57$, $p<0.05$).

Table 1. Difference of sociodemographic variables on screening intention

Variables	Screening test Intention	Screening test non-intention	X^2
Gender			
Male	42(45.2)	59(63.4)	0.31
Female	51(54.8)	34(36.6)	
Age/yrs			
≤39	10(10.8)	11(11.8)	6.28
40-49	23(24.7)	25(26.9)	
50-59	31(33.3)	41(44.1)	
≥60	29(31.2)	16(17.2)	
Marital status			
Single	17(18.3)	45(48.4)	0.57*
Married	76(81.7)	48(51.6)	
Education			
Middle school	21(22.6)	38(40.9)	7.96
High school	43(46.2)	31(33.3)	
Over college	29(31.2)	24(25.8)	
Monthly			
≤99	17(18.3)	7(7.5)	4.63
100-199	29(31.2)	23(24.7)	
200-299	33(35.5)	36(38.7)	
≥300	14(15.1)	27(29.0)	
Total	93(100.0)	93(100.0)	

3.2. Difference of health status on screening intention

Table 2 presents the difference of health status on screening intention. For self-conscious health status, 67.7% of the subjects who had an intention on screening test of stomach cancer was significantly higher than 22.6% of the subjects who didn't have an intention on screening test of stomach cancer among respondents responded as a good for self-conscious health status ($X^2=6.18$, $p<0.01$).

Table 2. Difference of health status on screening intention

Variables	Screening test Intention	Screening test Non-intention	X ²
Worry about cancer incidence			
High	57(61.3)	47(50.5)	3.27
Low	36(38.7)	46(49.5)	
Self-conscious health status			
Good	63(67.7)	21(22.6)	6.18**
Bad	30(32.3)	72(77.4)	
Smoking			
Current smoking	35(37.6)	42(45.2)	1.94
Non-smoking	58(62.4)	51(54.8)	
Alcohol			
Drinking	39(41.9)	46(49.5)	7.28
Non-Drinking	54 (58.1)	47(50.5)	
Regularly exercise			
Exercise	36(38.7)	31(33.3)	1.59
Non-exercise	57(61.3)	62(66.7)	
Cancer screening			
Yes	57(61.3)	23(24.7)	4.28*
No	36(38.7)	70(75.3)	
Cancer information			
Yes	35(37.6)	37(39.8)	6.29
No	58(62.4)	56(60.2)	
Total	93(100.0)	93(100.0)	

* $p < 0.05$ ** $p < 0.01$

3.3. Odds ratio of cancer screening according to patients' characteristics

Table 3 presents the odds ratio of cancer screening according to patients' characteristics. According to marital status, the odds ratio of married respondents showed significantly higher difference 2.39 times than single respondents on screening test of stomach cancer (OR=2.39, 95% CI=1.52-6.23).

Table 3. Odds ratio between risk factors of stomach cancer

Variables	OR	95% CI
Gender		
Male(standard/female)	0.48	0.21-3.56
Age (standard/over 60yrs)		
≤39	0.50	
40-49	0.51	0.34-0.95
≥50	0.42	0.28-1.78
Married(standard/single)	2.39	1.52-6.23
Education(standard/over College)		
Over middle school	0.46	0.27-5.94
High school	1.15	0.51-8.35
Monthly(standard/over 300)		
≤99	4.68	0.92-10.27

100-199	8.51	1.36-12.53
200-299	1.77	0.84-7.65
Cancer worries	1.55	0.59-4.81
Health status	7.20	1.65-13.2
Smoking	0.73	0.42-5.26
Drinking	0.35	0.17-3.74
Regular exercise	1.26	1.03-6.59
Cancer screening	4.82	0.48-8.71
Cancer information	0.91	0.27-5.36

3.4. Difference of cancer screening according to application of information system

Fig. 2 presents the difference of cancer screening according to application of information system. After application of information system was higher in the experimental group than the control group in the change of cancer screening rate in patients with gastric cancer, regardless of the time elapsed of 40 days. However, respondents who had received the cancer screening test were decreased rapidly with time elapsed of 80 days after application as compared to before application.

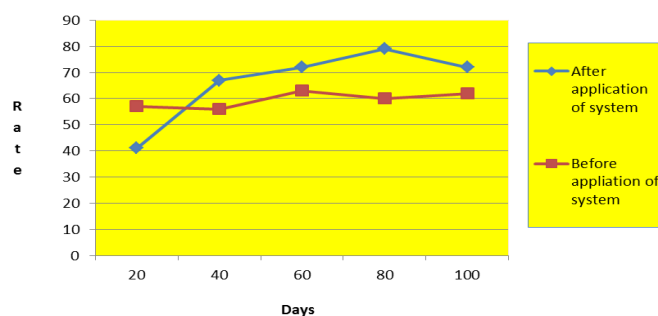


Figure 2. Difference of cancer screening rate

4. Discussion

The purpose of this study is to develop appropriate information system to improve cancer screening coverage of stomach cancer. The paper is to propose a new method of information parameter design for dynamic multi-response system as an information system.

As a result of this study, for self-conscious health status, 67.7% of the subjects who had an intention on screening test of stomach cancer was significantly higher than 22.6% of the subjects who didn't have an intention on screening test of stomach cancer among respondents responded as a good for health status. The finding was different from previous studies on the breast cancer [7],[8]. This study suggests that patients with bad health status should be targeted for intensive information application to prevent the incidence of stomach cancer. Based on the results obtained by the study, it is anticipated that this may be used an effective data for developing and applying multifunctional mediating system for improving health status in stomach cancer patients. In addition, large application studies should be established the multifunctional mediating system in order to prove results of this study.

According to marital status, the odds ratio of married respondents showed significantly higher difference 2.39 times than single respondents. That is, married respondents perform higher on screening test of stomach cancer than single respondents. This result was similar

with the previous studies on the CT screening test of abdominal disease [9],[10]. This study suggests that married respondents are responsible for family. So married respondents do more well for health management than single respondents.

Therefore the improvement of information system will be contribute to the health improvement of stomach cancer patients.

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I received the B.S. degree in consumer science from Seoul National University, Korea in 1987. I received the M.S. degree in health science from Seoul National University, Korea in 1992 and Ph.D in the same area from Catholic Medical College, Seoul, Korea in 2000. Currently, I am a professor in the department of medical information, Kongju National University, Korea. My present research interest is medical information.