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Are long-term cancer survivors and physicians discussing health promotion and healthy behaviors?

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Abstract

Purpose—This study aimed to 1) describe the proportion of survivors reporting that a physician discussed strategies to improve health and 2) identify which groups are more likely to report these discussions

Methods—Lung and colorectal cancer (CRC) survivors (>5 years from diagnosis) (n=874) completed questionnaires, including questions on whether in the previous year a physician discussed 1) strategies to improve health, 2) exercise, and 3) diet habits. Chi-square tests and logistic regression models were used to examine whether the likelihood of these discussions varied by demographic and clinical characteristics.

Results—Approximately 59% reported a physician discussed strategies to improve health and exercise, 44% discussed diet, and 24% reported no discussions. Compared to their counterparts, survivors with lower education were less likely report discussing all three areas, while survivors with diabetes were more likely. Survivors ≥65 were less likely to report discussing strategies to improve health and diet. Males and CRC survivors reported discussing diet more than their female and lung cancer counterparts, respectively

Conclusion—The frequency of health promotion discussions varies across survivor characteristics. While discussions were more frequently reported by some groups, e.g., survivors with diabetes, or among individuals less likely to engage in healthy behaviors, e.g., males, older and less educated survivors were less likely to have these discussions.

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Implications for survivors—Decreasing physician barriers and activating patients to discuss health promotion especially in the context of clinical care for older survivors and those with low education, is critical to promoting the overall well-being of cancer survivors.

Keywords

cancer survivors; health behavior; health promotion; physician advice

Introduction

The 5-year relative cancer survival rate has improved to 68%, greatly increasing the number of survivors expected to reach long-term survivorship [1]. Long-term survivors are at increased risk for comorbid conditions (i.e., diabetes, osteoporosis, cardiovascular disease) compared to the general population [2,3]. These comorbidities, as well as cancer recurrence and overall mortality, are not only caused by the primary cancer diagnosis and its treatment, but potentially by poor diet, limited physical activity and other lifestyle behaviors [4]. Survivors fall short of meeting dietary and physical activity recommendations [5-7] and have high risk for comorbid conditions. Given previous studies' findings that provider-delivered information is effective for encouraging healthy behaviors [8,9], promoting healthy behavior habits and sharing information on how to maintain overall health and wellness is especially important for this population both the primary care and oncology setting [10].

The frequency of survivors reporting having health promotion discussions with their physicians is varied. One study based on 2005 California Health Interview Study found that 68% of cancer survivors reported a physician discussed exercise and 61% reported diet was discussed [11]. Studies conducted using data from 2000 reported that less than half received advice on physical activity (35%) and dietary habits (<30%) [12,13]. However, the majority of survivors (80%) indicated that they were interested in receiving health promotion advice [12]. Moreover, some groups may be more likely to have these conversations. In non-cancer populations with conditions such as hypertension, for example, blacks, males, adults with Medicare insurance, or medically complex patients, such as overweight and diabetic patients, were more likely to receive lifestyle advice than their counterparts [14,15]. Given the importance of a healthy diet and a program of regular physical activity for all adults, determining whether physician discussions about health promotion varies across subgroups of cancer survivors, as it does in other patient groups, will help identify gaps in care for specific groups of cancer survivors.

Despite the emphasis on long-term survivorship care by several medical and non-medical organizations since 2000 [16,17] and the increasing evidence on the importance of lifestyle behaviors in survivorship [10,18,19], survivors have reported limited communication on health promotion with their health care providers and few recent studies have sought to examine the issue [20]. The aims of the present study were to determine the proportion of long-term lung and colorectal cancer (CRC) survivors participating in the Cancer Care Outcomes Research and Surveillance (CanCORS) Consortium study reporting that a physician discussed strategies to improve health or prevent illness, and/or discussed current exercise and diet habits. Moreover, we examined whether these discussions were more likely

for some groups of survivors than others. Based on findings in non-cancer populations, we hypothesized that blacks, males, and complex patients, i.e., with other comorbidities, will be more likely to have health promotion discussions with physicians than their counterparts. Similarly, because CRC incidence may be associated with healthy eating and exercise [21], we expect that these participants will be more likely to have their physician discuss health promotion than lung cancer patients.

Materials and Methods

Data and sample selection

The CanCORS Consortium was established by the National Cancer Institute in 2001 [22]. When initially funded it was comprised of five geographically distinct sites, five Cancer Research Network (CRN) integrated health systems, and 15 Veterans Health Administration hospitals. CRC and lung cancer patients within 4 to 7 months of diagnosis who were recruited through state cancer registries and health care administrative data, participated in baseline and follow-up surveys about initial treatment, care, and symptoms between 2003 and 2005 (CanCORS I). Minorities (African American, Asian/Pacific Islander, and Hispanic) were oversampled. Patients were re-contacted for CanCORS II beginning in 2012. Surveys were administered to patients and survivors focusing on long-term follow-up care and health. For CanCORS II, an advanced-disease survey was delivered to those with recurrent disease (n=101) and a disease-free survey was administered to those without recurrent disease (n=889) CanCORS II was only available in English. The survey instruments were pilot tested prior to implementation and comprised of validated questionnaires as well as new items developed for CanCORS [23]. Human subjects review boards approved all procedures at participating sites.

Sample selection criteria

Our study focused on the disease-free (no recurrent cancer) survivors from the CanCORS II survey (n=889). We excluded 15 survivors who did not see a physician (primary care or any other type) in the previous 12 months. The final sample size was 874.

Measures

Four primary dependent variables were used for this study based on three study questions. The three questions included “In the past 12 months, did a physician discuss: “specific things you could do to improve heath or prevent illness?”; “how much or what kinds of food you eat?”; and “how much or what kind of exercise you get?.” The fourth dependent variable was a summary variable indicating whether the survivor reported having any of the three discussions with their physician. Response options were “yes, definitely”, “yes, somewhat”, and “no”. The options “yes, definitely” and “yes, somewhat” were collapsed to create a dichotomous variable where one equals “yes” and zero equals “no” for each of the three dependent variables.

Survivors self-reported frequency of alcohol use and smoking status. Frequency of alcohol use was assessed through two items extracted from the Behavioral Risk Factor Surveillance Survey that measure frequency of drinking alcohol and the amount per occasion. There was

no item to assess whether a physician discussed drinking, so alcohol was not examined further in the analysis. Less than 2% of the entire sample qualified as a heavy drinker (Women= ≥4 drinks on any occasion and Men= ≥5 drinks). Overall, 44% did not drink at all and 47% reported only 1-2 drinks per occasion. For smoking, survivors were asked whether they smoked in the past twelve months. Those who responded “yes” then indicated whether they were a current smoker and whether a health care provider advised them to quit smoking. Only 13% (n=110) of the sample reported smoking in the past 12 months, and 56% of the 110 reported current smoking. Among those with a smoking history, 71% reported that a health care provider had advised them to quit.

We obtained data on age category, race, gender, marital status, and highest education achieved from baseline surveys. Clinical information on cancer type, stage, and time since diagnosis was obtained from medical records or cancer registry if medical records were unavailable. Comorbidities were self-reported by survivors at the time of CanCORs II survey. Comorbidities included high blood pressure, heart condition (heart attack, congestive heart failure, angina), stroke, diabetes, and pulmonary condition (chronic lung disease, emphysema).

Data analysis

Frequencies are presented for categorical variables and mean and standard deviations (SD) are presented for continuous variables. Chi-square tests were used to assess for differences in each physician advice variable by age (<65 years vs. ≥65 years), race (non-minority vs. minority), gender, cancer type, education, comorbidities (high blood pressure, diabetes, heart condition, stroke, pulmonary condition), diagnosis stage (Stage 0/I vs. Stage II-IV), and treatment type (surgery, radiation, and chemotherapy).

Four multivariable logistic regression models were conducted for each of the dependent variables. Variables found to be significant (at p with any of the dependent variables in the chi-square analyses were included in each of the multivariable models. Although treatment type was not significant in bivariate analysis, it was included in the multivariable model because of its association with comorbidities (e.g., treatment induced diabetes). Multicollinearity checks indicated no collinearity issues. Hosmer-Lemeshow goodness-fit-statistics indicated adequate model fit [24]. Analyses were conducted in SAS V9.3 (Cary, NC) [25].

Results

Sample characteristics

Approximately 73% of the sample was 65 and older at the time of survey, over half was male (52%), and 80% was White (Table 1). The majority of survivors had at least some college education. About 74% of the survivors were CRC survivors and 69% were diagnosed at Stage I or II. The mean number of years from diagnosis was about 7.5 years (SD=0.58) with a range of 6.1 to 9.4 years. Approximately 63% had high blood pressure, 29% reported a heart condition, and 26% reported having diabetes. Almost all survivors (91%) reported that the type of physician they had seen in the past twelve months was a

primary care physician. The majority of survivors reported that a physician discussed at least one of the health care topics (75%) (Table 2). Approximately one-third of the survivors discussed all three health promotion topics with their physicians (results not shown), and 24% reported they did not have any discussions.

Physician discussions on strategies to improve health or prevent illness

Table 2 shows that over half of participants reported that a physician discussed specific strategies to improve health or prevent illness. Younger survivors, those with higher education, those with diabetes or with high blood pressure had a significantly higher frequency of reporting these discussions in bivariate analysis (Table 3). Significant associations were confirmed in the multivariable model where those with diabetes, high blood pressure, and/or pulmonary conditions were more likely to report discussing strategies to improve health. Older patients and those with lower education (less than high school or high school degree) were significantly less likely to report discussing strategies to improve health compared to their counterparts (Table 4).

Physicians discussions on how much or what kind of foods eaten

Less than half of participants (44%) reported that the physician discussed how much and what kinds of food they eat. Younger survivors, minorities, males, CRC survivors, and those with diabetes had significantly higher frequencies of reporting receiving advice on food (Table 3). The multivariable model supported findings from the bivariate analysis (Table 4).

Physician discussions on how much or what kind of exercise

Table 2 shows that over half of participants reported that a physician discussed exercise habits. Younger survivors, minorities, CRC survivors, those with higher education, and those with diabetes had a higher frequency of reporting a physician discussed exercise compared to their counterparts. The multivariable model indicated that those with diabetes were significantly more likely to report that a physician discussed exercise (Table 4). Survivors with less than a high school education (OR 0.45, 95% CI: 0.27-0.75) or a high school education (OR 0.66, 95% CI:0.45-0.97) were significantly less likely to report that their physician discussed exercise habits compared to those with a college degree or higher.

Physician discussions of any of the three health promotion topics

Younger survivors, males, minorities, those with higher education, those who received chemotherapy and radiation, and those with diabetes or high blood pressure had higher frequencies of a physician discussing any of three areas of health promotion (Table 3). In the multivariable model, age, education, treatment, and diabetes remained significant (Table 4)

Discussion

Among long-term CRC and lung cancer survivors who had seen a physician in the past 12 months, 59% reported that their doctor discussed strategies to improve health, 59% reported doctors discussed exercise, and 44% reported that the doctor discussed the foods they ate. Of concern, almost 1 in 4 did not discuss any of the three areas with their physicians. Additionally, sub-groups of survivors, older survivors and those with low education, who are

also at higher risk of poor outcomes compared to their counterparts, were significantly less likely to report health promotion discussions.

The percentage of survivors reporting that their physician discussed exercise and diet (59% and 44%, respectively) was higher than the estimates previously reported from studies conducted using data from 2000 (35% and 30% [12]; 26% and 30% [13]) but slightly lower than the estimates from Weaver and colleagues (68% and 61%, respectively) [11]. It is possible our findings contribute evidence for a trend towards improvement in physicians having discussions of health promotion topics with cancer survivors. However, our population was comprised of CRC and lung cancer survivors, while previous studies included breast and prostate cancer only or a heterogeneous mix of many cancer types. It is possible that health promotion discussions in these cancer survivor groups remain low as previously reported.

Despite the potential improved frequency of health promotion discussions, a significant proportion of survivors surveyed in CanCORS reported not having them. Physician-reported barriers to discussing lifestyle behaviors with cancer survivors include concerns that lifestyle advice may be perceived as insensitive or implying blame [26], lack of knowledge and confidence to discuss the benefits of lifestyle factors [27], and lack of awareness of the importance of lifestyle factors [28]. These barriers somewhat contradict how survivors perceive health promotion advice from physicians. One study of survivors recently completing treatment found that 80% reported lifestyle advice to be helpful and stated that doctors had a duty to provide this information to survivors, while only a few (15%) felt advice would be insensitive [29].

Although studies have shown that physician engagement in information exchange for lifestyle behaviors can effectively and positively change behavior [8,9], some groups of survivors in our study were less likely to report having health behavior discussions, particularly older survivors and those with low education. Older survivors were less likely to report having at least one discussion of health promotion, and also less likely to discuss strategies to improve health and diet compared to younger survivors. However, they are especially in need of physician advice on health behaviors, given that previous studies indicate that older survivors are less likely to undertake healthful behavior change [12,30] or maintain healthy behavior [30]. Evidence also suggests that older survivors are more receptive to advice from physicians (e.g., perceive as beneficial) compared to younger survivors [29]. On the contrary, survivors with lower education may not have such attitudes: in fact, survivors with higher education had more positive attitudes to receiving advice from physicians than those with lower education [29]. This may explain our finding that CanCORS survivors with lower education were significantly less likely to have at least one discussion of health promotion and discussions about exercise. These findings are particularly concerning because there is evidence that the older and less educated population is not only less likely to engage in healthy behaviors [30,31], but also at higher risk for recurrence or other comorbid conditions compared to its counterpart [31].

Several of our findings were encouraging. While some groups are traditionally less likely to engage in healthy behaviors, for example males and minorities [12,32,33], in our study they

were more likely to report discussing the foods they eat with their physicians. Similarly, it is encouraging that survivors with health conditions for which there are clear linkages between healthy behaviors and better outcomes were more likely to discuss health improvement strategies, exercise, and diet [34]. For example, evidence supports benefits of healthy lifestyle behavior in CRC survivors (e.g., long-term survival, recurrence) [35]. Diabetes was the only comorbidity associated with higher likelihood of discussing all health topics with physicians. Not only are cancer survivors with diabetes more likely to report that cancer is affecting their health[36] and desire information on lifestyle behaviors [37,38], there is strong evidence for the health benefits of physical activity and improved diet for diabetes independent of cancer [39]. On the other hand, survivors with high blood pressure were more likely to report discussions about strategies to improve health, but not specifically on diet or exercise. This finding is partly consistent with a previous study where survivors with cardiovascular disease were more likely to report a physician discussed overall behavior change and exercise with them, but not diet [11]. Some limitations of our study include that CanCORS' survey questions only referred to discussions with one doctor and did not assess whether other types of health care professionals discussed health behaviors. The questions also did not identify whether the physician gave specific advice, or just had a conversation with the survivor about current habits. Data on height and weight was not available: this prevented us from determining whether discussion of health promotion may differ for normal weight vs. overweight patients. Without a measure of overweight status we cannot determine the clinical relevance of some of the discussions that were missed (e.g., greater implications for an overweight CRC survivor vs. a normal weight lung cancer survivor). The evidence is mixed on the difference in receiving health promotion advice by overweight status. Some studies found that the receipt of health promotion advice did not differ by overweight status [13], while others did find differences [11]. Comorbidities were self-reported and the duration was not known. Persistent, long-term comorbidities may increase health care utilization and the likelihood that physicians may discuss health promotion with survivors. Finally, there is a potential for recall bias with the patient-report of the discussion questions and we are unable to validate the responses with physician notes.

We found that more survivors may be having health promotion discussions than in the recent past, yet a significant proportion of survivors still do not report these discussions. Furthermore, while physicians are more frequently having health promotion discussions with some survivors for whom there are known benefits from healthy behaviors and/or who have been known to be less likely to engage in healthy behaviors (e.g., survivors with diabetes and males), they are not discussing these behaviors with other survivors who are at higher risk for poor outcomes associated with limited healthy behaviors, for example older and less educated survivors. Further research is warranted on how to promote these discussions, to educate physicians, other health care providers, and survivors on evidence-based guidelines related to health promotion, and ultimately to encourage health lifestyle strategies for survivors.

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Table 1
Patient characteristics of long-term CRC and lung cancer survivors (n=874)

	N	%
Age (years)		
<55 years	57	6.52
55-59	76	8.70
60-64	108	12.36
65-69	138	15.79
70-74	136	15.56
75-79	317	36.27
80+	42	4.81
Gender		
Male	458	52.40
Female	416	47.60
Race		
White	660	76.07
Hispanic	25	2.86
Black	113	12.93
Asian	31	3.55
Other*	43	5.15
Education		
Less than high-school	94	10.76
High school	242	27.69
Some college	249	28.49
College degree or higher	255	29.18
Marital Status		
Married/Partnered	615	70.37
Widowed	108	12.36
Divorced/separated	106	12.13
Never married/single	42	4.81
Cancer Type		
Lung	225	25.74
Colorectal cancer	649	74.26
Stage at diagnosis		
Stage I	381	43.59
Stage II	223	25.51
Stage III	237	27.12
Stage IV	29	3.32
Years since diagnosis		
Mean (SD)	7.59(0.58)	
Range	6.07-9.38	
Surgery		

	N	%
No	53	6.06
Yes	817	93.48
Treatments		
Neither	470	53.78
Radiation or Chemotherapy only	282	32.27
Both	117	13.39
Type of doctor(s) seen in last 12 months		
Primary care	798	91.35
Other type of doctor only	76	8.70
Diabetes		
No	642	73.46
Yes	228	26.09
Heart condition†		
No	619	70.82
Yes	251	28.72
High blood pressure		
No	322	36.84
Yes	550	62.93
Stroke		
No	798	91.30
Yes	73	8.35
Depression		
No	691	79.06
Yes	178	20.37
Pulmonary condition‡		
No	735	84.10
Yes	133	15.22
Any alcohol use		
No	742	84.90
Yes	132	15.10
Smoked cigarettes in past 12 months		
No	764	87.41
Yes	110	12.6
Current smoker (among past smokers)		
No	48	
Yes	62	

*Includes American Indian/Native American, Native Hawaiian, other Pacific Islander, more than one race, other, refused/don't know.

†Heart condition includes heart attack, coronary artery disease, angina, heart failure or other heart problem.

‡Pulmonary condition includes lung disease or emphysema

Table 2

Frequency of reporting physician discussion on health promotion: "In the past 12 months, did a doctor talk to you about…"

	N	%
Things you could do to improve health or prevent illness?		
No	342	39.13
Yes	518	59.27
How much or what kind of exercise you get?		
No	347	39.70
Yes	518	59.27
How much or what kind of food you eat?		
No	485	55.49
Yes	385	44.05
Summary measure: Have any of three discussions?		
No	218	24.94
Yes	656	75.06

Table 3

Bivariate relationships between reporting a physician discussed health promotion and demographic and clinical characteristics

	Physician discussed…											
	strategies to improve health/prevent illness			how much and what kind of food eaten			how much and what kind of exercise			any of the three topics		
	N	%	p	N	%	p	N	%	p	N	%	p
Age												
<65 years	173	72.38	<0.001	129	53.53	0.001	153	63.49	0.179	200	82.99	
≥65 years	345	55.56		256	40.70		365	58.49		456	72.04	0.001
Gender												
Male	284	62.56	0.235	227	49.67	<0.001	281	61.67	0.259	356	77.73	0.055
Female	234	57.64		158	38.26		238	57.91		300	72.12	
Race												
Non-Minority	379	58.67	0.104	261	39.79	<0.001	380	58.19	0.075	485	79.91	0.059
Minority	139	64.95		124	57.94		138	65.09		171	73.48	
Education												
<High school	42	46.15	0.008	38	40.86	0.481	46	48.94	0.035	61	64.89	0.027
High school degree	137	57.81		102	42.32		136	56.90		175	72.31	
Some college	153	62.70		118	47.77		154	62.86		194	77.91	
College or higher	167	65.75		107	41.96		164	64.31		201	78.82	
Cancer Type												
Lung	101	56.42	0.081	63	35.00	0.002	96	53.63	0.026	165	73.33	0.488
CRC	309	63.84		239	48.78		308	63.11		491	75.65	
Treatment												
Neither	200	59.00	0.204	142	41.52	0.166	198	58.41	0.509	333	70.85	
Radiation or Chemotherapy only	152	66.38		112	48.48		145	62.77		228	80.85	0.007
Both	58	61.05		48	49.48		61	62.89		91	77.78	
Stage at diagnosis												
Stage I	219	58.24	0.481	159	41.95	0.226	222	58.73	0.528	278	72.97	0.318
Stage II	129	59.45		94	42.15		128	58.18		166	74.44	
Stage III	150	64.10		116	49.36		150	64.10		188	79.32	

	Physician discussed…											
	strategies to improve health/prevent illness			how much and what kind of food eaten			how much and what kind of exercise			any of the three topics		
	N	%	p	N	%	p	N	%	p	N	%	p
Stage IV	19	65.52		15	51.72		17	58.62		23	79.31	
Heart Condition												
No	362	59.54	0.423	269	43.67	0.532	364	59.48	0.671	460	74.31	0.357
Yes	155	62.50		115	46.00		152	61.04		159	77.29	
Diabetes												
No	361	57.12	0.002	248	38.87	<0.001	363	57.35	0.010	465	72.43	0.003
Yes	155	69.20		134	58.77		153	67.11		188	82.46	
High blood pressure												
No	171	54.11	0.005	129	40.31	0.067	180	56.65	0.103	230	71.43	0.062
Yes	347	63.90		256	46.72		336	61.88		424	77.09	
Stroke												
No	476	60.56	0.817	351	44.10	0.699	474	60.08	0.845	596	74.69	0.368
Yes	42	59.15		33	46.48		43	58.90		58	79.45	
Depression												
No	404	59.32	0.260	297	43.04	0.165	405	59.30	0.491	514	74.38	0.308
Yes	112	64.00		86	48.86		110	62.15		139	78.09	
Pulmonary condition												
No	430	59.31	0.142	334	45.57	0.050	439	60.47	0.472	546	74.29	0.184
Yes	86	66.15		48	36.36		76	57.14		106	79.70	

Table 4

Odds ratios for reporting a physician discussed health promotion topic in the past 12 months

	Strategies to improve health/prevent illness N=816		Discuss how much and what kind of food eaten N=825		Discuss how much and what kind of exercise N=821		Any of the three topics N=828	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Age (ref =≥65 years)								
<65 years	2.18	(1.52-3.12)	1.58	(1.13-2.21)	1.18	(0.84-1.65)	1.86	(1.22-2.82)
Gender (ref=male)								
Female	0.94	(0.70-1.26)	0.9	(0.51-0.92)	0.99	(0.74-1.32)	0.84	(0.60-1.17)
Race (ref=non-minority)								
Minority	1.13	(0.79-0.162)	1.71	(1.20-2.42)	1.30	(0.92-1.86)	1.36	(0.89-2.07)
Education (ref=≥College degree)								
<High school	0.43	(0.26-0.73)	0.85	(0.51-1.44)	0.45	(0.27-0.75)	0.42	(0.24-0.72)
High school degree	0.66	(0.44-0.97)	0.97	(0.66-1.44)	0.66	(0.45-0.97)	0.61	(0.39-0.95)
Some college	0.80	(0.54-1.18)	1.23	(0.84-1.80)	0.90	(0.61-1.31)	0.88	(0.56-1.38)
Cancer type (ref=lung)								
CRC	1.24	(0.86-1.78)	1.41	(0.97-2.04)	1.18	(0.82-1.68)	1.10	(0.73-1.64)
Treatment (ref=neither)								
Radiation or chemotherapy only	1.33	(0.96-1.86)	1.45	(1.05-2.00)	1.23	(0.62-1.49)	1.49	(1.02-2.18)
Both radiation and chemotherapy	1.11	(0.71-1.74)	1.40	(0.90-2.18)	0.96	(0.58-1.38)	1.19	(0.72-1.98)
Diabetes (ref=no)								
Yes	1.80	(1.26-2.58)	2.23	(1.59-3.13)	1.55	(1.10-2.18)	1.99	(1.31-3.03)
High blood pressure (ref=no)								
Yes	1.61	(1.18-2.20)	1.13	(0.83-1.55)	1.19	(0.88-1.61)	1.33	(0.94,1.88)
Pulmonary condition (ref=no)								
Yes	1.64	(1.04-2.59)	0.81	(0.51-1.28)	1.00	(0.65-1.55)	1.62	(0.96-2.73)
Hosmer-Lemeshow Goodness-of-fit X^2(df)	X^2=5.54(8) P=0.806		X^2=9.83(8) P=0.278		X^2=7.35(8) P=0.499		X^2=8.46(8) P=0.390	

OR=odds ratio; CI= confidence interval; ref=reference group