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Short Communication

# Primary Prevention of Bladder Cancer – Does the Public Know the Risk Factors?

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**Abstract**

Smoking is the most significant modifiable risk factor for bladder cancer, yet this is not well known outside of the medical community. Previous studies have found 36-58% of urology patients can identify smoking as a risk factor for bladder cancer. We studied knowledge of cancer risk factors among members of the general public.215 participants over 18 years of age were recruited from the waiting room of an urban county hospital to participate in a brief survey on risk factors for various cancers. The survey participants were mostly female (65.6%), Hispanic (54%) and middle-aged (67% age 35-64). 54.8%had an annual household income of less than $20,000 73.2%had a high school education or less) and 40.3% were current or former smokers. An overwhelming majority of participants chose smoking as a risk factor for lung cancer (92.2%), with 80.7% identifying smoking as the primary risk factor for lung cancer. In contrast, only 31.2% of participants chose smoking as a risk factor for bladder cancer with 7.3% selecting it as the primary risk factor for bladder cancer. Knowledge of smoking as a risk factor for bladder cancer was not associated with education level, primary language, income, smoking status or personal or family history of cancer. Among participants of low socioeconomic status presenting to an urban county hospital, there is a concerning lack of knowledge about the association between smoking and bladder cancer. Future public health initiatives should highlight the strong association between smoking and bladder cancer.

## INTRODUCTION

Over 72,000 new cases of bladder cancer are diagnosed annually in the United States [1]. Not only is it the fifth most commonly diagnosed cancer in the United States, it is also the most costly cancer to treat from diagnosis to death [2-5]. Effective management of the disease (while costly) has successfully decreased bladder cancer mortality in recent years [1,6]. Given the success in treatment of the disease, the focus is shifting to primary prevention of the disease, namely with smoking cessation efforts, to decrease the incidence of bladder cancer [7-12].

First studied in the 1950s, it is well established that cigarette smoking is highly associated with bladder cancer [6,13-18]. More than half of all new cases of bladder cancer in the United States are directly attributable to smoking (the population attributable risk is 50% in men and 52% in women) [15]. In a large prospective study of the NIH-AARP cohort, current smoking conferred a 4-fold increased risk for the development of bladder cancer [15].This compares to an attributable risk of 71% for smoking and lung cancer and a relative risk approaching 20 for the development of lung cancer among smokers as compared to lifetime nonsmokers [16,17].

Knowledge of the link between smoking and bladder cancer is quite limited outside of the medical and research community. Previous studies on knowledge of the risk factors for bladder cancer have focused on patients with some exposure to urology [7,19-21]. In a study by Nieder and colleagues, only 36% of patients surveyed in a urology clinic were able to identify smoking as a risk factor for bladder cancer (with 98% identifying smoking as a risk factor for lung cancer) [20]. Even amongst patients with bladder cancer, Guzzo *et al* found only 51% of their sample of bladder cancer patients could identify smoking as a risk factor for bladder cancer (in contrast to the 86% identifying smoking as a risk factor for lung cancer) [19]. These findings were confirmed in a study among urological inpatients where 58% identified

smoking as a risk factor for bladder cancer (with 92% identifying it as a risk factor for lung cancer) [21]. Clearly, even patients with contact to the field of urology have knowledge deficits in terms of identifying the risk of smoking and bladder cancer. In fact, these patients may have even more knowledge of bladder cancer than the general public given their exposure. In one study of noninvasive bladder cancer survivors, active smokers endorsed relying mostly on their urologist for education about the risk of smoking and bladder cancer [8]. In addition, those patients cited their cancer diagnosis and the advice of their urologist as the two top reasons for smoking cessation [8]. Patients with contact to a urologist benefit in terms of both education and motivation for smoking cessation [8,9] and recognition of the urologist's role in influencing patient smoking behavior is increasing [8-12,22]. While multiple studies have examined the perceptions of urology patients about bladder cancer risk factors, no studies have focused on the knowledge base of the general public with regards to the risk factors for this deadly disease. Recognizing that smoking rates and poor health literacy are disproportionately high amongst individuals with lower income, lower education and racial/ethnic minorities, [23-27] we set forth to survey members of the general public in a county hospital reception area to examine their understanding of risk factors of bladder cancer and to better assess how they learn about risk factors for cancer.

## MATERIALS AND METHODS

In July 2014, 215 participants were recruited from the pharmacy waiting room of a large county hospital in Harris County (Houston, TX) to participate in an anonymous 27 item survey either in English or Spanish. Individuals in the pharmacy waiting room were approached and asked to participate in the brief survey. No incentive was offered. All participants were over the age of 18 years. Potential participants were excluded if a friend or family member had already completed the survey. All surveys were administered by two trained study personnel, one of whom was fluent in Spanish. For participants self-identifying as Spanish-speaking only, the survey and consent were conducted fully in Spanish. The survey contained 10 questions on knowledge of risk factors for different cancers (colon, bladder, lung, prostate and breast), 3 questions on personal/family history of cancer, 1 question on sources of information of cancer risk factors and 13 items pertaining to demographics and health questions (e.g. smoking status). Three cancers with a link to smoking (colon, bladder and lung) and two cancers without an established association with smoking (prostate, breast) were included to evaluate participants' ability to decipher between cancers with and without an association to smoking [28]. Approval for this study was granted by the Institutional Review Boards of the two overseeing institutions, MD Anderson Cancer Center and University of Houston Medical School, as well as by the Institutional Review Board of the Harris County Hospital District, where the study was conducted.

Summary statistics were used to describe population characteristics. To distinguish between general and specific knowledge of smoking and smoking-related outcomes, two definitions of knowledge were used: 1) "Primary Knowledge": those who listed smoking as the number one risk factor for a given cancer when applicable (e.g. for lung cancer or bladder cancer) and 2) "General Knowledge": those who chose smoking as a risk factor for bladder cancer when given the opportunity to select from a list of multiple risk factors. Fisher's exact test was conducted to assess differences in characteristics by knowledge. Additionally, a McNemar's test was conducted to determine whether correct identification of smoking as the primary risk factor for cancer was more likely as compared to other forms of cancer than for bladder cancer. Stata/SE v13.1 (College Station, TX) was used to conduct all statistical analysis.

## RESULTS AND DISCUSSION

A total of 215 participants were recruited, of which most were female (65.6%), Hispanic (54.0%), middle-aged (67.9% age 35-64), with 28.4% completing their survey in Spanish. Most had an annual income of less than $20,000 (54.8%) and had a high-school education (49.1%) or below (24.1%). The majority of participants had never smoked (60.3%). Of the 39.7% who were current or former smokers, most were light smokers, with more than two-thirds smoking less than a half-pack per day (Table 1).

When given multiple choices, an overwhelming majority of participants correctly identified smoking as a risk factor for lung cancer (92.2% had "General Knowledge" of lung cancer). When asked to choose the primary risk factor for lung cancer, 80.7% of participants selected smoking as the primary risk factor for lung cancer. In contrast, only 31.2% of participants chose smoking as a risk factor for bladder cancer with 7.3% selecting it as the primary risk factor for bladder cancer (Figure 1). Male gender and exposure to industrial chemicals were identified as risk factors for bladder cancer by a minority of patients (19.3% and 28.0%, respectively). Almost half of all participants surveyed (49.1%) incorrectly identified alcohol use as a risk factor for bladder cancer (Table 2).

Having "Primary Knowledge" about bladder cancer was not impacted by education, primary language, income or smoking status (Table 1). McNemar's test confirmed that the proportion of participants with Primary Knowledge of bladder cancer as compared to lung cancer was significantly different ($p<0.001$) and that this relationship was not seen in any of the other cancers studied (Table 3). Of participants, 39 (18.1%) had a personal history of cancer, 4 of whom had lung cancer and 1 had bladder cancer. Neither a personal history of cancer nor having cancer in friends/family impacted General or Primary Knowledge of bladder cancer (data not shown).

In terms of where patients received information about cancer risk factors, the only source that a majority (54.1%) of participants endorsed was television. The other most common sources of information included family (43.1%), brochures/pamphlets (42.2%), internet (38.1%) and health care professionals (35.3%) (Table 4).

In this study, participants of low socioeconomic status presenting to an urban county hospital had a concerning lack of knowledge about the major risk factors for bladder cancer. Participants not only were unable to readily identify smoking as a risk factor for bladder cancer, but nearly half of respondents made an erroneous connection between alcohol and bladder cancer. No demographic characteristic was found to be predictive of participants with Primary Knowledge of bladder cancer, raising

**Table 1:** Demographics and Population Characteristics by Primary Knowledge of Bladder Cancer.

| | | | | Primary Knowledge | | | |
|---|---|---|---|---|---|---|---|
| | Total | | | No | | Yes | p-value |
| **Characteristic** | **N** | **%** | **N** | **%** | **N** | **%** | |
| Gender | | | | | | | |
| Male | 74 | **34.4** | 68 | **34.2** | 6 | **37.5** | |
| Female | 141 | **65.6** | 131 | **65.8** | 10 | **62.5** | 0.789 |
| Age | | | | | | | |
| 18-24 | 19 | **8.7** | 19 | **9.4** | 0 | **0** | |
| 25-34 | 30 | **13.8** | 29 | **14.4** | 1 | **6.3** | |
| 35-49 | 72 | **33** | 65 | **32.2** | 7 | **43.8** | |
| 50-64 | 76 | **34.9** | 71 | **35.1** | 5 | **31.3** | |
| >=65 | 21 | **9.6** | 18 | **8.9** | 3 | **18.8** | 0.396 |
| Race | | | | | | | |
| Hispanic | 116 | **54** | 111 | **55.8** | 5 | **31.3** | |
| Asian | 3 | **1.4** | 3 | **1.5** | 0 | **0** | |
| Caucasian | 27 | **12.6** | 26 | **13.1** | 1 | **6.3** | |
| African-American | 68 | **31.6** | 58 | **29.1** | 10 | **62.5** | |
| Native-American | 1 | **0.5** | 1 | **0.5** | 0 | **0** | 0.108 |
| Annual Household Income | | | | | | | |
| Less than $20,000 | 114 | **54.8** | 109 | **56.8** | 5 | **31.3** | |
| $20,000 - $50,000 | 72 | **34.6** | 64 | **33.3** | 8 | **50** | |
| $50,000 - $100,000 | 18 | **8.7** | 16 | **8.3** | 2 | **12.5** | |
| $100,000 - $200,000 | 2 | **1** | 2 | **1** | 0 | **0** | |
| $200,000+ | 2 | **1** | 1 | **0.5** | 1 | **6.3** | 0.082 |
| Education | | | | | | | |
| Did not finish High School | 51 | **24.1** | 49 | **25** | 2 | **12.5** | |
| High School or GED | 104 | **49.1** | 93 | **47.4** | 11 | **68.8** | |
| Associate's Degree/Some College | 41 | **19.3** | 38 | **19.4** | 3 | **18.8** | |
| Bachelor's Degree | 14 | **6.6** | 14 | **7.1** | 0 | **0** | |
| Master's Degree or Beyond | 2 | **0.9** | 2 | **1** | 0 | **0** | 0.514 |
| Smoking History | | | | | | | |
| Current smoker | 33 | **15.3** | 29 | **14.5** | 4 | **25** | |
| Former smoker | 54 | **25** | 53 | **26.5** | 1 | **6.3** | |
| Never smoked | 129 | **59.7** | 118 | **59** | 11 | **68.8** | 0.116 |
| Smoking Intensity | | | | | | | |
| Never smoked | 129 | **60.3** | 118 | **59.6** | 11 | **68.8** | |
| About 5 cigarettes per day | 39 | **18.2** | 36 | **18.2** | 3 | **18.8** | |
| 1/2 PPD | 23 | **10.7** | 22 | **11.1** | 1 | **6.3** | |
| 1 PPD | 12 | **5.6** | 11 | **5.6** | 1 | **6.3** | |
| 1.5 PPD | 4 | **1.9** | 4 | **2** | 0 | **0** | |
| 2 PPD | 5 | **2.3** | 5 | **2.5** | 0 | **0** | |
| >2 PPD | 2 | **0.9** | 2 | **1** | 0 | **0** | 0.987 |
| Smoking History | | | | | | | |
| Current/Former | 87 | **40.3** | 82 | **41** | 5 | **31.3** | |
| Never | 129 | **59.7** | 118 | **59** | 11 | **68.8** | 0.598 |
| 12 Alcoholic Drinks in the Last Year | | | | | | | |
| Yes | 92 | **42.4** | 86 | **42.8** | 6 | **37.5** | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| No | 114 | **52.5** | 107 | **53.2** | 7 | **43.8** | |
| Don't know | 11 | **5.1** | 8 | **4** | 3 | **18.8** | 0.071 |
| 12 Alcoholic Drinks in Entire Life | | | | | | | |
| Yes | 152 | **70** | 141 | **70.1** | 11 | **68.8** | |
| No | 52 | **24** | 48 | **23.9** | 4 | **25** | |
| Don't know | 13 | **6** | 12 | **6** | 1 | **6.3** | >0.999 |
| Physical Activity in the Last Month | | | | | | | |
| Yes | 131 | **61.8** | 123 | **62.8** | 8 | **50** | |
| No | 81 | **38.2** | 73 | **37.2** | 8 | **50** | 0.423 |
| Weekly Activity that Works Up a Sweat | | | | | | | |
| Yes | 163 | **75.5** | 151 | **75.5** | 12 | **75** | |
| No | 53 | **24.5** | 49 | **24.5** | 4 | **25** | >0.999 |
| Primary Language Spanish | | | | | | | |
| No | 156 | **71.6** | 142 | **70.3** | 14 | **87.5** | |
| Yes | 62 | **28.4** | 60 | **29.7** | 2 | **12.5** | 0.247 |

"Primary Knowledge" of Bladder Cancer: those who listed smoking as the number one risk factor for bladder cancer. Results of Fisher's exact test comparing participants by Primary Knowledge listed (p-values).

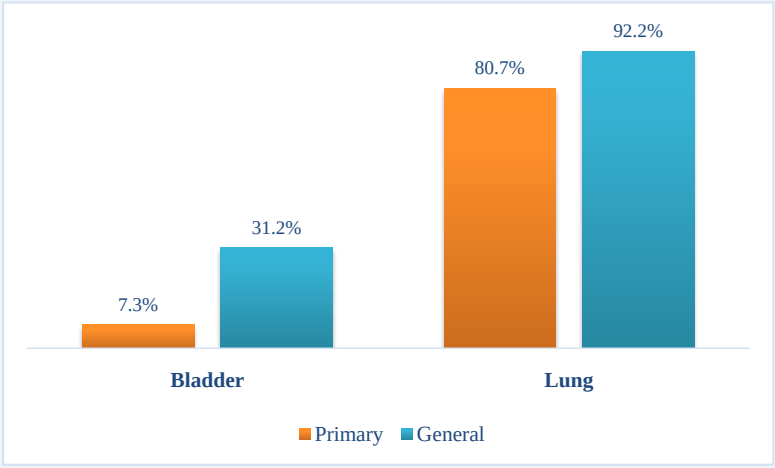


**Figure 1** Primary vs. General Knowledge of Bladder and Lung Cancer.
Primary Knowledge (identifying smoking as the number one risk factor for the given cancer) was much higher for lung cancer (n=176, 80.7%) than for bladder cancer (n=16, 7.3%). General Knowledge (selecting smoking as a risk factor for the given cancer) was higher for lung cancer (n=201, 92.2%) than for bladder cancer (n=68, 31.2%). See McNemar's test (Table 3) for the statistical comparison of these proportions.

the possibility that the 7.3% selecting smoking as the primary risk factor for bladder cancer may have been guessing. With television and family as the top resources for participants in this study, it is not surprising misconceptions about bladder cancer were prevalent. Further studies with a deeper investigation into these issues are warranted.

Limitations of this study include that it was a single-center study conducted in one urban county hospital, with participants of predominantly low socio-economic status voluntarily participating in the study. Self-selection bias may have played a role in the participant population as there was no randomization nor incentive offered to encourage participation.

## CONCLUSION

Smoking cessation prolongs life and quitting smoking can even modify the effectiveness of treatment among patients with bladder cancer [29-32]. Respondents in this study readily identified the link between smoking and lung cancer but only a minority identified smoking as a risk factor for bladder cancer. Given that the attributable risk of smoking and bladder cancer (50-52%) approaches that of lung cancer (71%), more attention should be paid to educating the general public about the specific cancer risks of smoking. Clinicians and other healthcare workers interested in primary prevention of bladder cancer should focus on highlighting the strong causative association of smoking and bladder cancer. Similarly, anti-smoking campaigns may also be more effective if they highlight the increased risk of bladder cancer among smokers. Low-income and low SES populations may be particularly meaningful groups toward which to target these efforts.

**Table 2:** Knowledge of All Risk Factors and the Primary Risk Factor for Various Cancers.

| | Colon | | Bladder | | Lung | | Prostate | | Breast | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All | Primary | All | Primary | All | Primary | All | Primary | All | Primary |
| Risk Factor | % | % | % | % | % | % | % | % | % | % |
| Age | 60.1 | 17.9 | 43.6 | 14.2 | 24.3 | 2.3 | **68.1** | **35.3** | 44.7 | 16.3 |
| Gender | 23.9 | 4.1 | 19.3 | 5 | 7.8 | 0.5 | 39.8 | 20 | 44.2 | 25.6 |
| Race | 16.5 | 1.4 | 11.5 | 0.5 | 6 | 0 | 10.2 | 2.3 | 17.1 | 2.3 |
| Family history of cancer | **67.9** | **30.7** | **58.7** | **25.2** | 51.8 | 9.6 | 44.9 | 14.4 | **48.8** | **29.3** |
| Alcohol | 28.9 | 4.6 | 49.1 | 22.5 | 25.2 | 1.4 | 25 | 9.3 | 15.2 | 1.4 |
| Lack of exercise | 28.4 | 0.9 | 22 | 2.3 | 21.6 | 1.4 | 22.2 | 3.7 | 24 | 1.4 |
| Smoking | **43.6** | **10.6** | **31.2** | **7.3** | **92.2** | **80.7** | **30.6** | **5.1** | **30.9** | **8.8** |
| Poor diet | 56 | 21.6 | 46.3 | 14.7 | 22.5 | 0.9 | 36.6 | 5.6 | 30.9 | 6 |
| Being overweight | 44.5 | 7.3 | 36.7 | 5 | 22.5 | 1.4 | 27.8 | 1.9 | 27.2 | 4.2 |
| Industrial chemicals | 30.7 | 0.9 | 28 | 3.2 | 45.9 | 1.8 | 18.1 | 2.3 | 23 | 4.7 |

"All": in response to "Which of the following increases your risk for (x) cancer?" participants could select multiple answers (columns do not total 100%). "Primary": in response to "Which is the #1 risk factor for (x) cancer?" participants could select only one answer. In bold are the percentages for smoking and the most common answer in each column.

**Table 3:** Selecting Smoking as the Primary Risk Factor for Bladder as Compared to Other Cancers.

| | | Cancer | | OR (95% CI) | p-value |
|---|---|---|---|---|---|
| | | **Lung** | | | |
| Bladder | | Y | N | | |
| | Y | 13 | 3 | 0.02 (0.004 - 0.05) | **<0.001** |
| | N | 163 | 39 | | |
| | | **Colon** | | | |
| | | Y | N | | |
| | Y | 8 | 8 | 0.53 (0.20 - 1.34) | 0.21 |
| | N | 15 | 187 | | |
| | | **Prostate** | | | |
| | | Y | N | | |
| | Y | 4 | 12 | 1.71 (0.62 - 5.14) | 0.359 |
| | N | 7 | 192 | | |
| | | **Breast** | | | |
| | | Y | N | | |
| | Y | 5 | 11 | 0.79 (0.32 - 1.86) | 0.69 |
| | N | 14 | 185 | | |

The results of the McNemar's test revealed selecting smoking as the primary risk factor was more likely for lung as compared to bladder cancer ($p<0.001$), but not for bladder cancer as compared to any of the other cancers studied.

**Table 4:** Sources of Knowledge about Cancer Risk Factors.

| Sources of Information | N | % |
|---|---|---|
| Books | 65 | 29.8 |
| Brochures, Pamphlets, etc. | 92 | **42.2** |
| Family | 94 | **43.1** |
| Friend | 64 | 29.4 |
| Health Care Professional | 77 | **35.3** |
| Internet | 83 | **38.1** |
| Library | 23 | 10.6 |
| Magazines | 62 | 28.4 |
| News | 36 | 16.5 |
| Radio | 42 | 19.3 |
| Television | 118 | **54.1** |
| Cancer Organizations | 64 | 29.4 |

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## REFERENCES

1. Siegel R, Naishadham D, Jemal A. Cancer statistics, 2013. CA Cancer J Clin. 2013; 63: 11-30.
2. Botteman MF, Pashos CL, Redaelli A, Laskin B, Hauser R. The health economics of bladder cancer: a comprehensive review of the published literature. Pharmacoeconomics. 2003; 21: 1315-1330.
3. Avritscher EB, Cooksley CD, Grossman HB, Sabichi AL, Hamblin L, Dinney CP, et al. Clinical model of lifetime cost of treating bladder cancer and associated complications. Urology. 2006; 68: 549-553.
4. Cooksley CD, Avritscher EB, Grossman HB, Sabichi AL, Dinney CP, Pettaway C, et al. Clinical model of cost of bladder cancer in the elderly. Urology. 2008; 71: 519-525.
5. Svatek RS, Hollenbeck BK, Holmäng S, Lee R, Kim SP, Stenzl A, et al. The economics of bladder cancer: costs and considerations of caring for this disease. Eur Urol. 2014; 66: 253-262.
6. Chavan S, Bray F, Lortet-Tieulent J, Goodman M, Jemal A. International variations in bladder cancer incidence and mortality. Eur Urol. 2014; 66: 59-73.
7. Bjurlin MA, Cohn MR, Freeman VL, Lombardo LM, Hurley SD, Hollowell CM. Ethnicity and smoking status are associated with awareness of smoking related genitourinary diseases. J Urol. 2012; 188: 724-728.

8. Bassett JC, Gore JL, Chi AC, Kwan L, McCarthy W, Chamie K, et al. Impact of a bladder cancer diagnosis on smoking behavior. J Clin Oncol. 2012; 30: 1871-1878.

9. Sosnowski R, Przewoźniak K. The role of the urologist in smoking cessation: Why is it important? Urol Oncol. 2015; 33: 30-39.

10. Strope SA, Montie JE. The causal role of cigarette smoking in bladder cancer initiation and progression, and the role of the urologist in smoking cessation. J Urol. 2008; 180: 31-37.

11. Watson RA, Sadeghi-Nejad H. Tobacco abuse and the urologist: time for a more proactive role. Urology. 2011; 78: 1219-1223.

12. Bassett JC, Gore JL, Kwan L, Ritch CR, Barocas DA, Penson DF, et al. Knowledge of the harms of tobacco use among patients with bladder cancer. Cancer. 2014; 120: 3914-3922.

13. Hammond EC, Horn D. Smoking and death rates: report on forty-four months of follow-up of 187,783 men. 2. Death rates by cause. J Am Med Assoc. 1958; 166: 1294-1308.

14. Vineis P, Alavanja M, Buffler P, Fontham E, Franceschi S, Gao YT, et al. Tobacco and cancer: recent epidemiological evidence. J Natl Cancer Inst. 2004; 96: 99-106.

15. Freedman ND, Silverman DT, Hollenbeck AR, Schatzkin A, Abnet CC. Association between smoking and risk of bladder cancer among men and women. JAMA. 2011; 306: 737-745.

16. Ezzati M, Lopez AD. Estimates of global mortality attributable to smoking in 2000. Lancet. 2003; 362: 847-852.

17. U.S. Department of Health and Human Services. Atlanta, GA: U.S. Department of Health and Human Services, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2004. The Health Consequences of Smoking: A Report of the Surgeon General.

18. Baris D, Karagas MR, Verrill C, Johnson A, Andrew AS, Marsit CJ, et al. A case-control study of smoking and bladder cancer risk: emergent patterns over time. J Natl Cancer Inst. 2009; 101: 1553-1561.

19. Guzzo TJ, Hockenberry MS, Mucksavage P, Bivalacqua TJ, Schoenberg MP. Smoking knowledge assessment and cessation trends in patients with bladder cancer presenting to a tertiary referral center. Urology. 2012; 79: 166-171.

20. Nieder AM, John S, Messina CR, Granek IA, Adler HL. Are patients aware of the association between smoking and bladder cancer? J Urol. 2006; 176: 2405-2408.

21. Anastasiou I, Mygdalis V, Mihalakis A, Adamakis I, Constantinides C, Mitropoulos D. Patient awareness of smoking as a risk factor for bladder cancer. Int Urol Nephrol. 2010; 42: 309-314.

22. Dearing J. Disease-centred advice for patients with superficial transitional cell carcinoma of the bladder. Ann R Coll Surg Engl. 2005; 87: 85-87.

23. Reid JL, Hammond D, Boudreau C, Fong GT, Siahpush M. Socioeconomic disparities in quit intentions, quit attempts, and smoking abstinence among smokers in four Western countries: Findings from the International Tobacco Control Four Country Survey. Nicotine Tob Res. 2010;12:905-914.

24. Wetter DW, Cofta-Gunn L, Fouladi RT, Irvin JE, Daza P, Mazas C, et al. Understanding the associations among education, employment characteristics, and smoking. Addict Behav. 2005; 30: 905-914.

25. Stewart DW, Adams CE, Cano MA, Correa-Fernández V, Li Y, Waters AJ, et al. Associations between health literacy and established predictors of smoking cessation. Am J Public Health. 2013; 103: e43-49.

26. Oncken C, McKee S, Krishnan-Sarin S, O'Malley S, Mazure CM. Knowledge and perceived risk of smoking-related conditions: a survey of cigarette smokers. Prev Med. 2005; 40: 779-784.

27. Viswanath K, Breen N, Meissner H, Moser RP, Hesse B, Steele WR, et al. Cancer knowledge and disparities in the information age. J Health Commun. 2006; 11 Suppl 1: 1-17.

28. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014. Printed with corrections, January 2014; 293.

29. Anthonisen NR, Skeans MA, Wise RA, Manfreda J, Kanner RE, Connett JE. Lung Health Study Research Group. The effects of a smoking cessation intervention on 14.5-year mortality: a randomized clinical trial. Ann Intern Med. 2005; 142: 233-239.

30. Grotenhuis AJ, Ebben CW, Aben KK, Witjes JA, Vrieling A, Vermeulen SH, et al. The effect of smoking and timing of smoking cessation on clinical outcome in non-muscle-invasive bladder cancer. Urol Oncol. 2014.

31. McAfee T, Davis KC, Alexander RL Jr, Pechacek TF, Bunnell R. Effect of the first federally funded US antismoking national media campaign. Lancet. 2013; 382: 2003-2011.

32. Xu X, Alexander RL Jr, Simpson SA, Goates S, Nonnemaker JM, Davis KC, et al. A Cost-Effectiveness Analysis of the First Federally Funded Antismoking Campaign. Am J Prev Med. 2014.

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