

Awareness of the role of physical activity in colon cancer prevention

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Abstract

Objective: This study examined the prevalence and correlates of U.S. adults' awareness of the role that physical activity plays in preventing colon cancer.

Methods: Data were analyzed for 1932 respondents to the Health Information National Trends Survey who answered a question about factors that reduce the chances of getting colon cancer. Individuals who listed physical activity in response to this question were denoted as being aware of its role in colon cancer prevention.

Results: Few respondents (15.0%) listed physical activity as a means of reducing colon cancer risk. Awareness was especially low among individuals aged 50 years and over, those with lower levels of education, individuals who believe that physical activity recommendations are confusing, those reporting less exposure to information about physical activity and cancer, individuals who did not report looking for information about cancer, those with poorer knowledge of colon cancer symptoms, and less physically active individuals.

Conclusions: There is poor awareness among U.S. adults of the role that physical activity plays in preventing colon cancer.

Practice implications: Health care providers should routinely inform their patients that engaging in regular physical activity greatly reduces the risk of developing colon cancer.

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1. Introduction

Colon cancer is a highly prevalent, yet largely preventable disease. It is the third most common cancer in the U.S., with an estimated 112,000 cases diagnosed in 2007 [1]. Multiple modifiable health-related behaviors confer a protective effect against colon cancer [2]. There is especially consistent evidence that regular physical activity greatly reduces colon cancer risk [3]. Compared to sedentary individuals, highly active individuals have a 30–40% lower risk of developing colon cancer [4], and physical activity reduces colon cancer risk in a dose–response manner [5]. Lack of physical activity is a leading cause of colon cancer, accounting for 14% of cases in the U.S. [6,7]. In comparison, approximately 12% of colon cancer cases in the U.S. are attributable to eating a Western diet, a further 12% are attributable to lack of regular intake of aspirin or other non-steroidal anti-inflammatory drugs, and 8% are attributable to a

family history of colon cancer [6,7]. An estimated 40.0% of the U.S. population engage in no leisure-time physical activity and only 29.7% meet national guidelines for engaging in regular physical activity [8].

Despite considerable evidence regarding the role of physical activity in colon cancer prevention, little empirical research has examined the extent to which U.S. adults are aware of this association. Shokar et al. [9] conducted a qualitative study of colorectal cancer knowledge with a sample of 30 individuals attending a family medicine clinic in Texas. Three of the 10 white participants, but none of the African American or Hispanic participants, mentioned that lack of physical activity is a risk factor for colorectal cancer. In other countries, awareness of the association between physical inactivity and colorectal cancer is generally low. For example, Keighley et al. [10] asked adults in 21 European countries whether they believed colorectal cancer could be caused by a lack of exercise. The percentage of individuals agreeing that a lack of exercise can cause colorectal cancer varied from lows of 12% in the Netherlands and 15% in each of Britain and France, to highs of 55% in Greece and 59% in Norway, with a mean of 30% across all 21 countries.

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Lack of awareness of physical activity's protective effect against colon cancer is important, because greater knowledge of this issue may promote more individuals to engage in regular activity. Indeed, results of several studies have shown that informing people about the link between physical activity and colon cancer increases motivation to be more physically active [11–13] and may also increase actual engagement in physical activities [12]. Greater physical activity protects not only against colon cancer, but also other forms of cancer, cardiovascular disease, hypertension, diabetes, obesity, and osteoporosis [14]. Thus, motivating individuals to become more physically active may reduce their risk of colon cancer and other illnesses.

In the current study, we used data from a national probability survey to document the level of awareness of the role of physical activity in colon cancer prevention among U.S. adults. Although colon cancer is primarily a disease of older adults, we included adults of all ages in the study in light of evidence that long-term engagement in regular physical activity may be needed to produce maximal reductions in colon cancer risk [15]. We also examined covariates of awareness of the role of physical activity in colon cancer prevention. In doing so, we sought to identify the characteristics of individuals who lack this knowledge, and who then could be targeted to receive information about the effect of physical activity in reducing colon cancer risk. Covariates examined in the study included demographic factors, beliefs about physical activity recommendations, exposure to information about physical activity and cancer, cancer information seeking, knowledge of colon cancer screening, and reported level of physical activity. Given the lack of prior research on this issue, we selected a broad array of covariates covering demographic factors, beliefs about physical activity recommendations, information exposure and seeking, colon cancer knowledge, and behavioral factors that might be associated with awareness of the role of physical activity in reducing colon cancer risk. To our knowledge, this study provides the most comprehensive examination to date of the issue of U.S. adults' awareness of the role of physical activity in colon cancer prevention.

2. Methods

2.1. Procedure

The data for this study are drawn from the 2005 Health Information National Trends Survey (HINTS). The HINTS is a biennial national probability survey of issues related to cancer information and health communication among U.S. adults. HINTS participants were identified using random-digit dialing and completed a one-time telephone or Internet survey. The HINTS utilized a cross-sectional, complex sample survey design, data weighting, jackknife variance estimation, and oversampling of Hispanic and Black populations. The response rate for the household screener was 34.01% and the response rate for the extended survey was 61.25%. These response rates are consistent with recent trends in other national studies using random-digit dialing methodologies [16]. Further details

regarding the HINTS are available elsewhere [16,17]. All statistical analyses were conducted using SUDAAN (version 9.0.1; Research Triangle Institute, Research Triangle Park, NC). All percentages reported in Section 3 are weighted and all sample sizes are unweighted.

2.2. Participants

The HINTS sample consisted of 5586 individuals, of whom 1937 were randomly assigned to answer questions regarding colon cancer prevention and were thus eligible for this study. (The 55 individuals in the full sample who reported a personal history of colon cancer did not answer the questions regarding colon cancer prevention.) We excluded 5 individuals who did not answer the question used to determine awareness of the role of physical activity in colon cancer prevention (see Section 2.3.7 below), leaving a sample of 1932 participants in the study. As noted in Sections 2.3.2 and 2.3.3 below, several of the measures were completed by a subset of these 1932 individuals.

2.3. Measures

2.3.1. Demographics

Participants indicated their gender, age, race/ethnicity, and level of education.

2.3.2. Beliefs about physical activity recommendations

Approximately half of the study participants were randomly assigned to answer questions regarding their beliefs about physical activity recommendations. Participants ($N = 925$) indicated whether they are more likely to ignore or pay attention to new recommendations they hear or read about physical activity. Participants ($N = 922$) also indicated their level of agreement with the following statement: "There are so many different recommendations about physical activity or exercise that it is hard to know which ones to follow." We coded individuals as either agreeing or disagreeing with this statement.

2.3.3. Exposure to information about physical activity and cancer

Approximately half of the study participants were randomly assigned to answer a question about their exposure to information about physical activity and cancer. Participants ($N = 929$) indicated whether they had seen, heard, or read anything in the past 12 months about physical activity (or exercise) and cancer.

2.3.4. Cancer information seeking

A single item asked participants whether they had ever looked for information about cancer from any source.

2.3.5. Knowledge of colon cancer symptoms

Participants were asked to name common symptoms of colon cancer. Individuals who correctly identified one or more colon cancer symptoms (e.g., blood in stool, change in bowel habits) were coded as such.

2.3.6. Level of physical activity

Two items asked participants to report how often and for how long they engage in moderate-intensity activities in a typical week. Individuals who reported no weekly moderate-intensity activities were denoted as being sedentary. Those who reported engaging in such activities from 1 to 149 min/week were denoted as engaging in some regular activity, and those reporting 150 min or more of weekly activities were coded as meeting physical activity recommendations [18].

2.3.7. Awareness of the role of physical activity in colon cancer prevention

Participants answered the following open-ended question: “What are some things that people can do to reduce their chances of getting colon cancer?” Interviewers allowed participants to list up to eight responses to this question. Individuals who listed exercise or physical activity in response to this question were coded as being aware of the role of physical activity in colon cancer prevention.

Table 1
Descriptive statistics for study variables and association between each covariate and awareness of the role of physical activity in colon cancer prevention, 2005 Health Information National Trends Survey (HINTS)

	Sample %	% (95% CI) of individuals aware of the role of physical activity in colon cancer prevention
Full sample (N = 1932)	100.0	15.0 (12.6–17.4)
Gender (N = 1932)		
Male	47.9	14.9 (10.9–18.9)
Female	52.1	15.1 (12.6–17.6)
Age (years)** (N = 1926)		
18–29	23.3	14.4 (8.2–20.6)
30–39	17.5	14.6 (10.6–18.6)
40–49	19.2	22.3 (16.4–28.2)
50–59	16.2	11.6 (8.7–14.5)
60–69	12.9	14.7 (9.7–19.7)
70+	11.0	9.5 (5.2–13.8)
Race/ethnicity (N = 1869)		
Hispanic	13.1	10.8 (4.5–17.1)
Non-Hispanic white	70.9	16.3 (13.8–18.8)
Non-Hispanic black	9.5	15.7 (6.4–25.0)
Non-Hispanic other	6.5	13.2 (4.2–22.2)
Education*** (N = 1878)		
Less than high school	15.4	8.3 (4.1–12.5)
High school graduate	28.0	8.8 (5.4–12.2)
Some college	32.3	16.4 (12.4–20.4)
College graduate	24.3	25.1 (19.7–30.5)
Response when faced with new PA recommendations (N = 925)		
Ignore them	33.7	13.5 (8.7–18.3)
Pay attention to them	66.3	13.9 (9.5–18.3)
Belief that PA recommendations are confusing** (N = 922)		
Disagree	25.3	22.4 (16.7–28.1)
Agree	74.7	10.6 (6.6–14.6)
Exposed to information about PA and cancer in past year* (N = 929)		
Yes	32.2	21.9 (13.2–30.6)
No	67.8	9.8 (7.1–12.5)
Ever looked for information about cancer*** (N = 1932)		
Yes	49.9	19.1 (15.3–22.9)
No	50.1	10.9 (8.2–13.6)
Know any symptoms of colon cancer*** (N = 1918)		
Yes	51.0	20.2 (16.8–23.6)
No	49.0	9.7 (6.3–13.1)
Level of PA*** (N = 1873)		
Sedentary	15.2	7.3 (3.5–11.1)
Some activity	29.7	15.2 (11.3–19.1)
Meet PA recommendations	55.2	17.6 (14.1–21.1)

Note: All percentages are weighted. Asterisks denote a significant association between the covariate and awareness of the role of physical activity in colon cancer prevention: * $p < .05$; ** $p < .01$; *** $p < .001$.

CI, confidence interval; PA, physical activity.

3. Results

Descriptive statistics for the study variables are shown in the “Sample %” column of Table 1. There was an equal gender split and considerable variability in participants’ age, race/ethnicity, and education. There was also variability in responses to the questions pertaining to beliefs about physical activity recommendations, exposure to information about physical activity and cancer, cancer information seeking, knowledge of colon cancer symptoms, and level of physical activity. Of the study participants, 15.0% indicated that physical activity reduces the risk of colon cancer. The right hand column of Table 1 shows the results of a series of chi-square analyses examining the association between each covariate and awareness of the role of physical activity in colon cancer prevention. Neither gender nor race/ethnicity was associated with awareness of the role of physical activity in reducing colon cancer risk. Awareness was higher (22.3%) among individuals aged 40–49 years compared to older individuals. Among individuals with lower levels of education, fewer than 1 in 10 were aware of physical activity’s role in preventing colon cancer. Whether individuals pay attention to or ignore new physical activity recommendations was not associated with awareness of the role of physical activity in colon cancer prevention. Individuals who agreed with the statement that physical activity recommendations are confusing were less aware of the role of physical activity in reducing colon cancer risk than individuals who disagreed with that statement. Lower awareness was also found among individuals who did not report being exposed to information about physical activity and cancer in the past year, had never looked for information about cancer, or were unable to name any symptoms of colon cancer. Also, sedentary individuals were less aware of the role of physical activity in colon cancer prevention than more active individuals.

We also conducted a multiple logistic regression analysis ($n = 900$) with the statistically significant covariates from the chi-square analyses included as independent variables and awareness of the role of physical activity in colon cancer prevention as the dichotomous dependent variable. In this analysis, age ($\chi^2 = 11.35$, $p = .04$) and knowing one or more colon cancer symptoms ($\chi^2 = 4.37$, $p = .04$) were statistically significant covariates (for all other covariates, χ^2 s ≤ 3.28 , $ps \geq .07$). Given the lack of previous research on this issue, and the relatively small number of covariates available in the HINTS dataset used for this study, we encourage further examination of covariates of awareness of the role of physical activity in colon cancer prevention in future research.

4. Discussion and conclusion

4.1. Discussion

The results of this national probability survey of U.S. adults revealed that fewer than one in six study participants (15.0%) was aware that physical activity plays a role in reducing risk for colon cancer. This low level of awareness suggests that public

health communication efforts regarding the strong protective effective of physical activity against colon cancer are lacking and/or ineffective. This level of awareness is lower than the average of 30.0% reported by Keighley et al. [10] in their study of adults across 21 European countries. However, comparability of the current study results and those of Keighley et al. is limited by the use of different methodologies for eliciting participants’ beliefs regarding the role of physical activity in colon cancer prevention. Disease attribution beliefs collected by open-ended strategies, as in the current study, commonly diverge from results collected through structured questioning as used by Keighley et al., although both questionnaire formats yield valuable information [19]. Open-ended methods elicit beliefs that come to mind most easily whereas structured questioning yields beliefs associated with prompting. The open-ended methods utilized in the current study may be most relevant to individuals’ decision-making about health behavior adoption. However, regardless of the measurement approach utilized, and across many countries, awareness of the role of physical activity in colon cancer prevention is generally low.

Results of the 2003 HINTS survey indicate that more than two-thirds (69.9%) of U.S. adults believe that physical activity can help reduce the risk of getting some types of cancer [17]. However, more than two-thirds (68.2%) of adults holding this belief indicated that they do not know which specific types of cancer physical activity helps prevent [20]. Combined with the results of the current study, these findings suggest that although many individuals are aware that physical activity helps to prevent cancer, there is poor awareness of the specific cancers for which it provides a protective effect.

We identified several factors that were associated with either greater or poorer awareness of the role of physical activity in colon cancer prevention. Individuals aged 40–49 years had better awareness than older individuals, although across all age groups fewer than 1 in 5 individuals were aware that physical activity protects against colon cancer. Awareness of the role of physical activity in preventing colon cancer was poor among individuals with lower levels of education. This is consistent with prior research that has identified an association between poor cancer-related knowledge and low socioeconomic status [21–23]. There was also low awareness among individuals who believe that physical activity recommendations are confusing. Although the causal direction of this association cannot be determined from the study results, it suggests the need for clearer information to be presented to individuals about physical activity recommendations and, more specifically, the diseases for which regular physical activity confers risk reduction.

We also found lower awareness among individuals reporting that they had not been exposed to information about physical activity and cancer, among individuals who had never looked for information about cancer, and among those unable to name any symptoms of colon cancer. These findings indicate that lack of awareness about the role of physical activity in preventing colon cancer may be part of a larger pattern of low information exposure and seeking about cancer and its prevention. Thus, public health messages may provide less success in overcoming

such knowledge deficits than more focused efforts in primary care settings to provide clear information about the role of physical activity in preventing cancer (and other illnesses). This latter approach has considerable potential, given that 81.2% of U.S. adults visit a doctor or other healthcare provider each year, and 64.1% have two or more visits [24], more than half (58.9%) of which are to primary care providers [25]. Additionally, patients expect to receive preventive health information and counseling from primary care providers [26,27].

Sedentary individuals were less aware of the role of physical activity in colon cancer prevention. Informing these individuals about the protective effect of physical activity against colon cancer may motivate them to become more physically active [11–13]. Future research is needed to determine whether additional gains in physical activity motivation are produced if messages about the role of physical activity in reducing colon cancer risk are combined with messages about its role in reducing the risks of other illnesses and conditions. Given time constraints in primary care settings, identifying brief, effective interventions to promote physical activity is a key priority.

There is accumulating evidence that primary care physical activity interventions are effective in promoting individuals to become more physically active, at least in the short-term [28,29]. These interventions can be effectively implemented using the 5A's framework: Assess physical activity levels; Advise about personal health risks and benefits of behavior change; Agree on treatment goals and methods; Assist with behavior change techniques; and Arrange follow-up support [30]. The results of the current study suggest that the Advise step might gainfully include a message from providers that engaging in regular physical activity greatly reduces the risk of colon cancer, as well as the risk of other cancers, cardiovascular disease, diabetes, and osteoporosis. This may be especially important for individuals who are at increased risk for colon cancer due to a family history or the presence of other colon cancer risk factors. Of note, the 5A's approach can be implemented by a combination of providers, for example with a physician conducting the first two steps (Assess and Advise) and another healthcare provider completing the 5A's steps.

The current study has several limitations. The study response rate was low, although not inconsistent with recent trends for studies using random-digit dialing methodologies. Given a lack of information regarding the characteristics of individuals who refused study participation, it is unclear how the low response rate may have affected the study results. The cross-sectional design of the HINTS does not allow conclusions to be drawn regarding the potential causal association between covariates and awareness of the role of physical activity in colon cancer prevention. Additionally, self-reported levels of physical activity may not correspond to actual activity. Given the limited availability of relevant covariates in the HINTS dataset, the study lacked a guiding theoretical framework. Further, the outcome variable for this study – awareness of the role of physical activity in colon cancer prevention – was measured using a single open-ended item. It is known that older adults generally perform worse than younger adults in free

recall tasks [31], which might in part explain age-related findings in the current study. Also, other measurement approaches (e.g., closed-ended) may yield varying estimates of awareness of the role of physical activity in colon cancer prevention.

4.2. Conclusions

There is poor awareness among U.S. adults of the role that physical activity plays in reducing the risk for colon cancer. Increasing awareness of the protective effect of physical activity against colon cancer may encourage individuals to become more active. Efforts to increase this awareness should be undertaken within the context of coordinated, comprehensive interventions to promote physical activity. Given that more than half of adults aged 50 years and over are not adherent to colon cancer screening guidelines [32,33], and the fact that these individuals are less physically active than screened individuals [34], helping individuals to become more active may reduce the incidence and overall burden of colon cancer in the U.S.

4.3. Practice implications

Health care providers should routinely inform their patients that engaging in regular physical activity greatly reduces the risk of developing colon cancer (and other diseases). Individuals most in need of this information include those over the age of 50, those with lower levels of education, individuals who believe that physical activity recommendations are confusing, those with less exposure to information about physical activity and cancer, individuals who do not look for information about cancer, those with poorer knowledge of colon cancer symptoms, and less physically active individuals.

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