Differences in Beliefs and Behaviors Related to COVID-19 Prevention Among Adult Current and Former Smokers and With and Without A Cancer Diagnosis

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Abstract

Purpose: Study aims included assessing differences in beliefs/behaviors about COVID-19 prevention among current and former smokers with and without cancer.

Design: A cross-sectional survey about COVID-19 beliefs/behaviors was administered from June 2020 to January 2021.

Setting: Survey conducted online via Qualtrics from June 2020 to January 2021.

Subjects: Participants were current (n = 101) and former (n = 102) smokers with and without cancer.

Measures: Questions were related to beliefs about efficacy of and engagement in behaviors for COVID-19 prevention.

Results: Results from logistic regressions displayed that individuals with cancer were more likely to indicate using hand sanitizer with at least 60% alcohol was ineffective (OR = .12, 95% CI: [.02, .65]) and avoided public transportation (OR = 1.84, 95% CI: [1.04, 3.28]) compared to those without cancer. Former smokers were more likely to indicate taking vitamin C was effective (OR = .45, 95% CI: [.22, .93]) and rinsing your mouth with salt water (OR = 1.89, 95% CI: [1.02, 3.50]) was ineffective compared to current smokers. Current smokers were more likely to indicate not smoking was effective compared to former smokers (OR = 2.19, 95% CI: [1.13, 4.24]).

Conclusions: Counters to COVID-19 misinformation may need to be tailored to different at-risk groups based on differential beliefs and behaviors.

Keywords
COVID-19, COVID-19 prevention, smoking, cigarettes, cancer

Purpose

Individuals who have certain health concerns, such as those with cancer1 or cigarette smokers,2,3 may be at particular risk for serious illness or death if COVID-19 is contracted. There have been conflicting messages related to preventing and treating COVID-19 (eg, use of remdesivir, use of bleach).4,5 The current study aimed to assess COVID-19 beliefs and behaviors of current and former cigarette smokers, and among those with and without a cancer diagnosis. We expected individuals with cancer and former smokers to report engagement in more preventive behaviors and endorse that more scientifically-supported strategies (eg, mask wearing, social distancing) are effective for preventing COVID-19 spread. Analyses related to non-scientifically supported beliefs about preventing COVID-19 spread (eg, ideas seen on Internet such as drinking hot liquids) were exploratory given the current lack of literature.

Methods

Design

Participants were recruited via social media, ResearchMatch and Prolific research platforms, and the University of Virginia Virginia Cancer Center. They completed a cross-sectional online survey via Qualtrics between June 2020 and January 2021 and were compensated by having the option to enter to win one of two $50 Amazon gift cards. Participants who completed via the Prolific...
research platform were also compensated as required by the platform. Altered consent forms that allowed participants to continue with the survey questions if they agreed with the terms were used rather than requiring a physical signature. All study procedures were approved by the University of Tennessee Health Science Center IRB, and were acknowledged by the University of Memphis IRB.

Sample

Overall, 2823 potential participants answered screening questions as part of a larger parent study. Cell sizes were limited based on the parent study criteria, and eligible participants were permitted to take the main survey until their cell was filled, which resulted in the high number of “screen fails” because the individual’s respective cell was already full and closed. Participants were 203 adults (18 years or older) who were either a current cigarette smoker or had smoked in the past but were currently quit. Current smokers and former smokers without cancer were eligible. Individuals with a cancer diagnosis were eligible if they quit after their diagnosis.

Study recruitment occurred through partnerships with medical environments affiliated with the University of Virginia and social media sites. Participants were also recruited via Research Match and Prolific, which are participant recruitment platforms. The final sample was comprised of 114 individuals without a cancer diagnosis, 89 with cancer, 102 former smokers, and 101 current smokers (individuals could be in multiple groups).

Measures

Questions asked about demographic information, cancer status (eg, if a medical professional had told them they had cancer), tobacco use (ie, if they had smoked at least 100 cigarettes in their lifetime, smoked in the past 30 days), and beliefs and behaviors related to COVID-19. Specifically, participants were given a list of methods to protect against COVID-19 (ie, nine recommendations from the Centers for Disease Control [CDC] and seven unfounded recommendations shared on social media sites) and asked to choose how effective they thought those methods were in preventing COVID-19 among options of ineffective, neither effective nor ineffective, and effective. Participants were also asked five questions about their actual preventative behaviors related to COVID-19 in the past week. Answer responses were either binary or rarely, sometimes, usually, always, or did not go out. Tables 1 and 2 include a list of the beliefs, behaviors, and answer options. This survey was created at the beginning of the pandemic and there had not yet been substantial literature published. Items were created by the first author based on information in the news and on social media early in the pandemic, as well as recommended strategies proposed by government agencies such as the CDC and World Health Organization.

Analysis

Descriptive statistics were calculated, and logistic regressions were used to determine differences between groups controlling for age. Logistic regressions were used given the categorical nature of the dependent variables and the ability to assess differences between the groups. All analyses were conducted using IBM SPSS version 25.

Table 1. Beliefs Regarding Strategies to Reduce COVID-19 Spread.

| Strategies                        | Effective N (%) | Ineffective N (%) | Neither Effective nor Ineffective N (%) |
|-----------------------------------|-----------------|-------------------|----------------------------------------|
| Effective                         |                 |                   |                                        |
| Hand washing                      | 183 (90.1)      | 6 (3.0)           | 14 (6.9)                               |
| Disinfect commonly used items in home | 168 (82.8)   | 8 (3.9)           | 26 (12.8)                              |
| Wearing a mask                    | 162 (79.8)      | 17 (8.4)          | 23 (11.3)                              |
| Avoiding going out                | 169 (83.3)      | 13 (6.4)          | 21 (10.3)                              |
| Not smoking                       | 71 (35.0)       | 47 (23.2)         | 83 (40.9)                              |
| Social distancing                 | 178 (87.7)      | 10 (4.9)          | 14 (6.9)                               |
| Coughing/sneezing into elbow      | 140 (69.0)      | 25 (12.3)         | 37 (18.2)                              |
| Using hand sanitizer with at least 60% alcohol | 171 (84.2)  | 12 (5.9)          | 19 (9.4)                               |
| Ineffective/Unknown effectiveness |                 |                   |                                        |
| Drinking hot liquids              | 14 (6.9)        | 126 (62.1)        | 61 (30.0)                              |
| Rinsing mouth with salt water     | 10 (4.9)        | 126 (62.1)        | 65 (32.0)                              |
| Taking vitamin C                  | 51 (25.1)       | 68 (33.5)         | 84 (41.4)                              |
| Taking other vitamins             | 55 (27.1)       | 62 (30.5)         | 85 (41.9)                              |
| Sanitizing delivered packages     | 89 (43.8)       | 36 (17.7)         | 76 (37.4)                              |
| Leaving packages in sunlight to sanitize | 35 (17.2)  | 80 (39.4)         | 87 (42.9)                              |
| Showering upon returning home     | 90 (44.3)       | 42 (20.7)         | 71 (35.0)                              |
| Getting a flu vaccine             | 50 (24.6)       | 78 (38.4)         | 75 (36.9)                              |
Results

Most participants were female (73.4%), White (85.2%), and non-Hispanic (92.6%). Average age was 49.2 years. Most participants (69.0% - 90.1%) correctly identified effective strategies (ie, handwashing, disinfecting, mask wearing, avoiding going out, sneezing/coughing into elbow, using sanitizer with at least 60% alcohol, social distancing). However, many participants reported that several of the ineffective strategies and strategies with unknown effectiveness were neither effective nor ineffective (eg, leaving packages in sunlight, taking vitamin C; 30.0% - 42.9%), which could potentially represent uncertainty or feelings that the behavior would not hurt or help.

Individuals with cancer were more likely to indicate that sanitizer with at least 60% alcohol was ineffective (OR = .12, 95% CI: [.02, .65]) and report avoiding using public transportation (OR = 1.84, 95% CI: [1.04, 3.28]) than those without cancer. All other beliefs and behaviors were not significantly different between groups (P > .05).

Former smokers were more likely to indicate that taking vitamin C was effective and rinsing your mouth with salt water was ineffective, while current smokers were more likely to endorse that these strategies were neither effective nor ineffective. It may be the case that former smokers are more conscientious about their health given their ability to achieve cessation previously, or that there is simply confusion surrounding more obscure strategies. Additionally, current smokers were more likely to believe that not smoking was effective for preventing COVID-19 spread, while former smokers were more likely to endorse it was neither effective nor ineffective. It may be that stopping smoking is more salient for current smokers in the face of a respiratory disease than it is for former smokers because they are still actively smoking. Current smokers may also experience symptoms from smoking that are similar to COVID-19 (eg, difficulty breathing, coughing, sore throat), making smoking a salient threat. It may be prudent to capitalize on this belief and use the pandemic as a “teachable moment” for current smokers and provide additional information about smoking cessation resources. It may also be a good time to provide relapse prevention resources and bolster support for their quit among former smokers since they are not as concerned about smoking and COVID-19.

Discussion

Summary

Overall, most participants seemed to have accurate knowledge related to what is and is not effective for preventing COVID-19 spread. However, corrective messaging may be needed related to using hand sanitizer with at least 60% alcohol among individuals with cancer given that they were more likely to endorse that this would be ineffective to prevent COVID-19 spread. This is particularly important given their medical vulnerability and their potential need to use sanitizer more frequently if they are in medical settings receiving treatment. Additionally, information about how to take adequate safety precautions when using public transportation may be important given that most services have resumed and many have returned to the workplace, but those with cancer are more concerned with using public transportation to travel than those without cancer.

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Limitations

Limitations to the study included a small sample size that was largely White and female, which may preclude generalizability of the findings. Second, most participants endorsed engagement in helpful preventative behaviors or correct beliefs for most items, which may have impacted results due to a ceiling effect. Further research is needed among larger diverse samples to better understand if these differences in beliefs and
behaviors generalize. Lastly, survey items about COVID-19 prevention behaviors and beliefs were created by the first author based on media at the beginning of the pandemic, and thus are not based on a standardized measure.

Significance

The results from the current study can help to inform future research assessing belief and behaviors differences so that we understand which groups may need to be targeted with specific corrections to misinformation about the disease. This may supplement previous work assessing creative ways to combat misinformation via technology (eg, phones)\(^6\) and visual illustrations.\(^7\) By combatting COVID-19 misinformation, we can help to garner support for and adherence to helpful prevention efforts to reduce COVID-19 transmission.

So What?

**What Is Already Known On This Topic?**

Misinformation about COVID-19 is common, and there is evidence to suggest that individuals undergoing cancer treatment are more likely to spread misinformation than those without cancer.

**What Does This Article Add?**

Study results provide information about the COVID-19 prevention beliefs and behaviors among vulnerable populations (ie, cancer patients and cigarette smokers).

**What Are the Implications for Health Promotion or Practice?**

Results can help to inform campaigns to correct misinformation about COVID-19. Some beliefs and behaviors may differ across groups and require specific targeting.

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Author’s Note

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Author Contributions

Kinsey Pebley wrote the original draft, facilitated data collection, completed data analysis, and secured funding. Dr. Rebecca Krukowski assisted with writing and revisions to the draft.

Declaration of Conflicting Interests

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