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Cultural Differences in Cancer Information Acquisition: Cancer Risk Perceptions, Fatalistic Beliefs, and Worry as Predictors of Cancer Information Seeking and Avoidance in the U.S. and China

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ABSTRACT

Cancer is one of the most common causes of death in China and the United States. Past studies found that cancer risk perceptions, fatalistic beliefs, and worry were prominent predictors of health-related behaviors. Perceived cancer risks, fatalistic beliefs, and worry were associated with cancer information acquisition in the United States. However, little is known about whether these factors played comparable roles in China. This study investigates the psychological antecedents of cancer information acquisition using data from Health Information National Trends Surveys (HINTS) in both countries. Results showed that cancer worry was negatively related to cancer information avoidance in the U.S. but positively related to information avoidance in China. Also, whereas cancer fatalistic beliefs were negatively associated with cancer information seeking in the U.S., the relationships between fatalistic beliefs and cancer information seeking exhibited more complex patterns in China. Implications for cancer communication in different cultures are discussed.

Cancer is the second most common cause of death in the United States (Heron, 2019) and the third leading cause of death in China (Zhou et al., 2019). With rapid economic growth in China, prominent fatal diseases have gradually shifted from infectious diseases to chronic ones, such as cancer (Zhou et al., 2019). When different countries and cultures face similar challenges, cancer prevention and control have emerged as a global public health issue. Specifically, lung cancer, breast cancer, and colorectal cancer are among the most prevalent cancer types in both China and the U.S. (Feng et al., 2019).

Cancer mortality rates can be lowered through early detection and regular screening (American Cancer Society, 2019). Cancer information acquisition plays an essential role in this process because it increases people's knowledge of related risks and of the need for timely treatment. Information seeking is also positively associated with cancer prevention behaviors and adherence to screening guidelines (Wigfall & Friedman, 2016). By comparison, cancer information avoidance may reduce the likelihood of taking cancer-preventive behaviors (Emanuel et al., 2015; Miles et al., 2008). Thus, it is important to understand the antecedents of cancer information seeking and avoidance to promote healthy behaviors in the general population.

Health and risk communication research suggested that perceived cancer risks, cancer worry, and cancer fatalistic beliefs (e.g., beliefs about whether cancer can be prevented through individual efforts) are important predictors of cancer information seeking and avoidance behaviors (Finney Rutten et al., 2016; Kobayashi & Smith, 2016; Miles et al., 2008; Nan et al., 2012; Peng et al., 2019).

One limitation with the existing health communication research, however, is that most theories were developed and tested in the U.S. based on the American population. Culture is often overlooked in health communication research despite cross-national differences in psychological processes (Markus & Kitayama, 1991). Insufficient evidence exists regarding whether important factors identified in health communication research conducted in the U.S. function similarly in different cultures. Thus, cross-national research to address this question has the potential of making important theoretical contributions regarding whether insights from U.S.-based health communication research are generalizable to other cultures (Lu et al., 2020).

China and the U.S. are the two most populous countries in the Eastern and the Western world, respectively (U.S. Census Bureau, 2019). They are also the two largest economies on this planet (International Monetary Fund, 2019). Differences in cultures and values (Hofstede, 1980; Hofstede Insights, 2020) between the two countries can make it challenging to apply what works in one country to the other. For instance, the U.S. has an individualistic culture that values independence and individual control of health risks (Ishii, 2013; Triandis, 1994, 1995). In contrast, China is known for being a collectivistic culture, in which social relationships and interdependence are key factors influencing where people obtain their trusted information.

The goal of this study is therefore to examine the relationships between cancer perceptions/beliefs/emotions (i.e., perceived cancer risks, cancer fatalistic beliefs, and cancer worry) and health information acquisition behaviors (i.e., cancer

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information seeking and avoidance) in both the U.S. and China, using data from 2017 Health Information National Trends Surveys (HINTS). Comparable versions of the survey were conducted in both countries. Findings from this study will contribute to our understanding of the similarities and differences in the psychological antecedents of cancer information acquisition behaviors between China and the United States.

Literature review

Cancer information seeking and avoidance

Cancer information seeking is a purposive process where people actively look for cancer-related information (Johnson, 1997). Research shows that people use a wide range of communication sources for cancer information, including doctors, family/friends, newspapers/magazines, TV, radio, cancer organizations, and the Internet (e.g., see Barnes et al., 2017; Kelly et al., 2010). Although doctors are the most preferred source of cancer information when the information need is strong, the Internet has become the most popular avenue for daily cancer information search in the U.S. (Barnes et al., 2017).

Cancer information seeking research has great practical value because seeking is associated with positive health outcomes (for a review, see Wigfall & Friedman, 2016). For example, cancer information seeking is related to the acquisition of cancer knowledge (Kontos et al., 2012), adoption of healthy lifestyles (e.g., vegetable/fruit consumptions and physical exercises, Ramírez et al., 2013), and engagement in cancer screening/detection behaviors (Liu et al., 2020; Shim et al., 2006). Thus, cancer information seeking should be promoted, which calls for a close examination of the important factors that contribute to seeking behaviors.

The general public has only moderate levels of knowledge about cancer (Shim et al., 2006). Given that insufficient health knowledge is positively associated with disease morbidity and mortality rates (Cameron et al., 2011), it is expected that people would actively seek cancer information due to its substantial health benefits (Johnson, 2014). That said, people who are at risk of health problems may also tend to avoid exposure to related information. Such information avoidance might be prominent for serious diseases such as cancer (Emanuel et al., 2015; Miles et al., 2008), one of the leading causes of death in both the U.S. and China (Heron, 2019; Zhou et al., 2019). For example, because cancer diagnosis has negative mental impacts that can induce depression and anxiety (Granek et al., 2019), people may intentionally shy away from cancer information (Johnson, 2014).

Thus, in this study, cancer information seeking and avoidance are deemed as two separate coping strategies. Previous literature has also made a distinction between two types of health information acquisition patterns: health information seeking when motivated by their information needs, people look for information proactively; and health information scanning when people come across health information serendipitously (Kelly et al., 2010; Niederdeppe et al., 2007). The two types of behaviors may not directly contradict each other such that no-seeking does not necessarily mean avoidance. For instance, people who lack the motivation to seek cancer information may watch cancer information on TV attentively if they chance upon such a program. Indeed, research suggested that scanning might be the most popular way through which the general public got exposed to cancer-related information (Kelly et al., 2010). We hence treated cancer information seeking and avoidance as two distinct outcomes when examining their possible antecedents (Yang & Kahlor, 2012).

Predictors of cancer information seeking and avoidance

A careful review of the relevant health and risk communication literature revealed several antecedents of cancer information seeking and avoidance behaviors, including perceived cancer risks (Hovick et al., 2014; Jun & Nan, 2018; Nan et al., 2012; Wang et al., 2020; Yang et al., 2014), cancer worry (Finney Rutten et al., 2016; Jensen et al., 2010; Lee & Hawkins, 2016; Wang et al., 2020; Yang et al., 2014), and cancer fatalistic beliefs (Beeken et al., 2011; Kobayashi & Smith, 2016; Niederdeppe & Levy, 2007). We focused on people who had never been diagnosed with cancer (non-patients) and controlled for the influence of demographics (age, gender, race, education, income, and marital status) when examining the effects of cancer risk perceptions, cancer worry, and cancer fatalistic beliefs on cancer information seeking and avoidance.

Risk perceptions are different from objective risk assessments that are grounded on evidence from the actual level of risks (Gierlach et al., 2010). Rather, perceived cancer risks focus on individuals' subjective evaluations about their probability of being affected by cancer in the future. Perceived health risk is a common factor in several health communication models including the Comprehensive Model of Information Seeking (Johnson & Meischke, 1993), the Health Belief Model (Rosenstock et al., 1988), the Planned Risk Information Seeking Model (Hovick et al., 2014), and the Protection Motivation Theory (Rogers, 1975). Risk perceptions appeared to be an important antecedent of the adoption of healthy behaviors. It also predicts health information seeking because it heightens people's perceived disease relevance, making health issues more salient. Accordingly, people with higher perceived cancer susceptibility were more likely to seek cancer-related information (Nan et al., 2012; Rains, 2007; Wang et al., 2020; Zhao & Cai, 2009) and engage in cancer screening (Katapodi et al., 2004).

Conventional health and risk communication models typically only focused on perceived susceptibility as an indicator of cancer risk perceptions (Becker, 1974; Rosenstock et al., 1988; Witte & Allen, 2000). Recent research suggested, however, that neglecting emotional concerns might limit the impact of risk perceptions on subsequent health behaviors (Ferrer et al., 2012; Janssen et al., 2012; Portnoy et al., 2014), highlighting the importance of examining cancer worry. Cancer worry represents the negative-valenced responses experienced by individuals regarding cancer as an uncertain health issue (Jensen et al., 2010). Past studies found that cancer worry was positively related to cancer information seeking (Finney Rutten et al., 2016) and it also increased adherence to cancer screening routines (Hay et al., 2006; McCaul & Mullens, 2003; Zhao & Nan, 2016). Because

worry is based on uncertainty, information seeking may serve as effective coping strategies to deal with health-related uncertainty (Lee & Hawkins, 2016; Peng et al., 2019).

Therefore, based on previous findings, it is expected that for U.S respondents, people with higher perceived cancer risks and cancer worry will be more likely to seek cancer information. Also, they will be less likely to avoid cancer information if they chance upon it accidentally. We hence proposed the following hypotheses.

Hypothesis 1: Perceived cancer risks are positively related to cancer information seeking behaviors for U.S. respondents.

Hypothesis 2: Perceived cancer risks are negatively related to cancer information avoidance for U.S. respondents.

Hypothesis 3: Cancer worry is positively related to cancer information seeking behaviors for U.S. respondents.

Hypothesis 4: Cancer worry is negatively related to cancer information avoidance for U.S. respondents.

Cancer fatalistic beliefs are another particularly important factor that influences cancer information seeking and avoidance (Kobayashi & Smith, 2016). Cancer fatalism refers to the belief that cancer risks are determined by external forces such that cancer cannot be effectively prevented or managed because it is noncontrollable by individuals (Powe & Finnie, 2003). Health Information National Trends Surveys (HINTS) studied fatalistic beliefs about the cause, the consequence, and the prevention of cancer. Specifically, they emphasized the unavoidability of the causes of cancer, the inability to prevent cancer, and the pessimism regarding the consequences of cancer (Kobayashi & Smith, 2016; Valera et al., 2018). Although these beliefs reflected distinct dimensions of cancer fatalism, overall, they could reduce perceived behavioral control of cancer and motivations toward taking actions (Straughan & Seow, 1998).

Cancer fatalistic beliefs obstruct the adoption of cancer prevention behaviors and are negatively associated with confidence and perceived capability to control cancer risks (Niederdeppe & Levy, 2007). When people believe that cancer cannot be prevented, they may feel that any cancer prevention behaviors are in vain and as a result, they may abandon their efforts to reduce cancer risks. Specifically, past studies demonstrated that cancer fatalistic beliefs decreased the likelihood of cancer prevention behaviors (Niederdeppe & Levy, 2007) and were negatively associated with intensions for cancer screening (Beeken et al., 2011). Fatalism also resulted in less cancer information seeking (Kobayashi & Smith, 2016) and more cancer information avoidance (Miles et al., 2008; Peng et al., 2019).

Given the previous findings that cancer fatalism can reduce motivations for health behaviors, we hypothesize that if people believe that there is not much they can do to prevent cancer, they will give up the efforts to obtain cancer-related health information. They may also avoid cancer information. Thus, for U.S. respondents, we propose the following hypotheses.

Hypothesis 5: Cancer fatalistic beliefs are negatively related to cancer information seeking for U.S. respondents.

Hypothesis 6: Cancer fatalistic beliefs are positively related to cancer information avoidance for U.S. respondents.

Cultural differences in predicting cancer information acquisition

Cancer is a global health issue, but cancer communication theories were disproportionally developed and tested in the United States. Culture has been identified as an important behavioral determinant (Segall et al., 1990). Psychological mechanisms need to be investigated in different countries to see whether they have universal applicability (Cole, 1996). Cancer risk perceptions, worry, and fatalistic beliefs are all psychological constructs. Examining their roles in explaining cancer information acquisition in China and the U.S. can inform health communication practice in both countries. Moreover, these two countries have drastically different national cultures (Hofstede, 1980).

Different cultural values lead to distinct approaches to solving problems (Triandis, 1994). Between China and the United States, the largest contrast can be observed in the individualism versus collectivism dimension of cultural differences (Hofstede Insights, 2020). Individualistic cultures endorse independence-oriented values that focus on self-reliability and personal control over health risks. In contrast, collectivistic cultures embrace interdependence-centered perspectives, highlighting social-relatedness, wholistic approaches, and the influence of societal norms (Triandis, 1994, 1995). Individualistic versus collectivistic culture may differentially influence how perceived cancer risks and cancer worry affect cancer information seeking and avoidance in the following ways.

First, personal cancer risk perceptions may be more pronounced predictors in an individualistic culture than in a collectivistic culture (Norenzayan & Nisbett, 2000). This is because individualists highly value personal ability/competency and autonomy in risk management/control. They are more likely to make behavioral decisions based on their dispositional thoughts and feelings (Ishii, 2013). In contrast, collectivists care more about others' perceptions and beliefs in their social circles and are more likely to take actions that align with external social norms rather than their own thoughts and attitudes (Markus & Kitayama, 1991). Following this line of reasoning, self-oriented psychological constructs such as personal risk perceptions and cancer worry may play a more prominent role in explaining behaviors in an individualistic culture than in a collectivistic culture (Oyserman & Lee, 2008).

Second, independence-oriented individualists are also more likely to perceive themselves in a self-enhancing way which may result in more confidence in personal risk control than interdependence-oriented collectivists who tend to value group efforts over individual endeavors (Bontempo et al., 1997; Chang & Asakawa, 2003; Heine & Lehman, 1995). Indeed, past studies found that the American people have an optimistic bias about future life events (Klein & Helweg-Larsen, 2002). They also tend to see risks/uncertainties as opportunities for

self-serving endeavors and are thus more accepting of risks than collectivists, who are generally risk/loss averse and security-oriented (Douglas & Wildavsky, 1982; Hong, 1978). In many U.S. movies, people are depicted in a stereotypical adventurous manner emphasizing the power of individual agency. In such a cultural context, individualists may seek more cancer information because of their optimism and confidence in personal risk management. In contrast, since an early cancer detection – as resulted from information acquisition (a major benefit of information seeking) – also implies an earlier exposure to disease-related stress and fear, risk-averse people growing up in collectivist cultures may be more likely to avoid knowing their chance of getting cancer.

Despite the existence of extensive research on cultural differences between the East and the West, little health communication research has applied findings from research on cultural psychology to explain differences in health behaviors. Furthermore, because most existing evidence on how psychological antecedents influence cancer information acquisition is U.S.-focused and little is known regarding these relationships in China, we posed the following research questions.

Research Question 1: Are perceived cancer risks associated with cancer information seeking for Chinese respondents?

Research Question 2: Are perceived cancer risks associated with cancer information avoidance for Chinese respondents?

Research Question 3: Is cancer worry associated with cancer information seeking for Chinese respondents?

Research Question 4: Is cancer worry associated with cancer information avoidance for Chinese respondents?

Regarding cancer fatalistic beliefs, previous studies have looked at fatalistic beliefs of Asian Americans/Asian immigrants or its subgroups in the United States (Heiniger et al., 2015; Jun & Oh, 2013; Liang et al., 2008, 2004). These studies surveyed Asians in countries other than China (Kim & Lwin, 2017), or interviewed a specific subgroup of Chinese people, for instance, breast cancer patients (Cheng et al., 2013). These studies revealed mixed findings. For example, some studies found that fatalistic beliefs were negatively associated with adherence to cancer-screening routines among Asian Americans (Jun & Oh, 2013) and Chinese American women (Liang et al., 2008). By comparison, other research found that those Chinese and Korean immigrants in the United States who had higher levels of cancer fatalistic beliefs exercised more; however, such fatalistic beliefs were not predictive of cancer screening frequency (Heiniger et al., 2015). Also, those Chinese breast cancer patients with more fatalistic beliefs were more likely to actively engage in self-care (Cheng et al., 2013).

To understand the inconsistent results across studies regarding the relationship between cancer fatalistic beliefs and cancer information acquisition in China requires an understanding of the meaning of fatalism in the Chinese cultural context. According to Cheng et al. (2013), cancer fatalism in China should be more accurately labeled as fatalistic voluntarism. This paradoxical term refers to a tendency of Chinese people who are willing to actively engage in what they can to address a dangerous or fatal problem, despite their higher likelihood of accepting cancer as an uncontrollable event (Lee, 1995). Different from fatalism which is characterized by a sense of powerlessness about an uncontrollable event, fatalistic voluntarism has a positive future orientation and can benefit emotional- and problem-coping strategies facing cancer/cancer risks (Cheng et al., 2013; Chui & Chan, 2007). Such a seemingly self-contradictory way of thinking is actually consistent with Buddhist teachings, which are deeply rooted in the Chinese culture for nearly two thousand years and still permeate Chinese people's way of thinking and daily life until day. Buddhism maintains that *karma* plays a major role influencing a person's health and lifespan. Karma is fatalistic in the sense that no one can escape the power of karma when his time of death comes. Meanwhile, Karma can be altered when people voluntarily perform wholesome deeds to accumulate positive karma while cleanse negative one. Indeed, when Cheng et al. (2013) interviewed Chinese breast cancer survivors, they found that while these survivors perceived cancer as out of personal control, they nonetheless undertook active self-care and mood management strategies aiming at better cancer outcomes. Similarly, research with non-cancer patients also found that fatalistic Chinese people may actively engage in coping strategies such as health promotion behaviors (Heiniger et al., 2015). Following this line of reasoning and based on the mixed findings from previous studies, we proposed the following research questions.

Research Question 5: Are cancer fatalistic beliefs associated with cancer information seeking for Chinese respondents?

Research Question 6: Are cancer fatalistic beliefs associated with cancer information avoidance for Chinese respondents?

Method

Data source and sample

In this study, the data about the U.S. population came from the 2017 U.S. Health Information National Trends Survey 5 Cycle 1. HINTS 2017 was a nationally representative survey administrated by the National Cancer Institute where data were collected via mailing and telephone calls between January 2017 and May 2017. The dataset and related survey details can be accessed online at the following link (http://hints.cancer.gov/). We only included respondents without a cancer history (people who have never been diagnosed with cancer). The final U.S. sample size is 2,301 after removing cases with missing data for this study's key variables or demographic control variables.

Inspired by the U.S. HINTS, Renmin University of China collaborated with the George Mason University, the Chinese National Cancer Center, and the Center for Health Education at the Chinese Ministry of Health and surveyed the general population of China about their cancer information access and use. The 2017 China HINTS survey

borrowed questions from the U.S. HINTS survey, with adaptations to the Chinese population's cancer-related information-seeking habits, health perceptions, and beliefs (Yu et al., 2017). 2017 China HINTS used multistage random sampling where trained interviewers visited randomly selected households to administer the survey in face-to-face settings during May 2017. The final sample size for the Chinese HINTS survey is 3,080 after excluding cancer patients. Demographic information was summarized in Table 1.

Survey measures

Perceived cancer risk

Perceived cancer risk was measured by asking respondents to estimate how likely they will get cancer in their lifetime. Answers were recorded on a 5-point scale from 1 = very unlikely to 5 = very likely (M = 3.09, SD = 0.94 for the U.S. sample, and M = 2.25, SD = 0.87 for the Chinese sample).

Cancer worry

Respondents were asked how worried they are about getting cancer with a 5-point response scale where 1 = not at all, and 5 = extremely (M = 2.53, SD = 1.08 for the U.S. sample, and M = 2.18, SD = 1.01 for the Chinese sample).

Table 1. Demographics of respondents.

Demographics	Number (%) of U.S. respondents (N = 2,301)	Number (%) of Chinese respondents (N = 3,080)
Race/Ethnicity		
Americans (White)	1,435 (62.4%)	/
Americans (Black)	311 (13.5%)	/
Americans (Hispanic)	346 (15.0%)	/
Americans (Asian)	122 (5.3%)	/
Americans (other)	87 (3.8%)	/
Chinese (Han)	/	3040 (98.7%)
Chinese (other)	/	40 (1.3%)
Age		
18–30	213 (9.3%)	1348 (43.8%)
31–45	541 (23.5%)	1051 (34.1%)
46–60	713 (31.0%)	681 (22.1%)
61–75	679 (29.5%)	/
>75	155 (6.7%)	/
Gender		
Female	1337 (58.1%)	1884 (61.2%)
Male	964 (41.9%)	1196 (38.8%)
Married		
No	1071 (46.5%)	907 (29.4%)
Yes	1230 (53.5%)	2173 (70.6%)
Education		
No college	510 (22.2%)	1384 (44.9%)
College	1335 (58.0%)	1519 (49.3%)
Postgraduate	456 (19.8%)	177 (5.7%)
Income		
Low	363 (15.8%)	823 (26.7%)
Low-Medium	600 (26.1%)	678 (22.0%)
Medium	758 (32.9%)	719 (23.3%)
Medium-High	437 (19.0%)	691 (22.4%)
High	143 (6.2%)	169 (5.5%)
Insurance		
No	113 (4.9%)	198 (6.4%)
Yes	2188 (95.1%)	2882 (93.6%)

Cancer fatalistic beliefs

Cancer fatalistic beliefs were measured by three items assessing respondents' perceived controllability of cancer regarding cancer causes, consequences, and prevention. The three items were analyzed separately following previous research which indicated that they measured distinct dimensions of cancer fatalistic beliefs and their relatively low reliability as a composite index (Kobayashi & Smith, 2016; Valera et al., 2018). Responses from the U.S. sample were recorded on a 4-point scale where 1 = strongly agree and 4 = strongly disagree. Responses were then reverse coded so that 1 = strongly disagree and 4 = strongly agree. Chinese responses were measured with a 5-point scale where 1 = strongly disagree and 5 = strongly agree. The three items included 1) the fatalistic belief about the cause of cancer: "It seems like everything causes cancer" (M = 2.76, SD = 0.89 for the U.S. sample)/"Too many things can cause cancer" (M = 3.32, SD = 1.07 for the Chinese sample); 2) the fatalistic belief about the consequence of cancer: "When I think about cancer, I automatically think about death" (M = 2.71, SD = 0.97 for the U.S. sample, and M = 2.94, SD = 1.15 for the Chinese sample); and 3) the fatalistic belief about cancer prevention: "There's not much you can do to lower your chances of getting cancer" (M = 1.97, SD = 0.89 for the U.S. sample, and M = 2.94, SD = 1.04 for the Chinese sample).

Cancer information seeking

General cancer information seeking experience was evaluated by the question "Have you ever looked for information about cancer from any source?" where 0 = No, and 1 = Yes.

Cancer information avoidance

To assess intentions to avoid exposure to cancer-related information, U.S. respondents were asked to indicate the extent to which they agree that they would avoid knowing their risk of getting cancer using a 4-point scale where 1 = strongly agree and 4 = strongly disagree. We then reverse coded the response options so that 1 = strongly disagree and 4 = strongly agree (M = 2.12, SD = 1.01). Chinese respondents were asked to indicate how much they agree that they would like to avoid cancer-related information with a 5-point scale where 1 = strongly disagree and 5 = strongly agree (M = 2.75, SD = 1.00).

Demographics

Demographics information, including respondents' race/ethnicity, age, gender, marital status, education, income, and health insurance status was also collected and controlled in the analyses.

Results

We conducted multivariate logistic regressions to examine the predictors of cancer information seeking as it was measured as a dummy dependent variable (with odds ratios and 95% confidence intervals reported) and we performed multivariate linear regressions to investigate the antecedents of cancer information avoidance as it was measured as a continuous dependent variable (with standardized regression coefficients, unstandardized regression coefficients, and 95% confidence intervals reported). Results for the U.S. sample were summarized in Table 2 while results for the Chinese sample were shown in Table 3.

Table 2. Psychological antecedents of cancer information acquisition among U.S. respondents (N = 2,301).

Characteristic	Information seeking (1 = Yes) OR [95% CI]	Information avoidance (4-point scale) β (B) [95% CI]
Demographics		
Race/Ethnicity		
Americans (White)	*Reference*	*Reference*
Americans (Black)	1.19 [0.90, 1.56]	−.08 (−0.25) [−0.37, −0.13]***
Americans (Hispanic)	0.93 [0.72, 1.21]	−.10 (−0.29) [−0.41, −0.17]***
Americans (Asian)	1.21 [0.81, 1.82]	.00 (−0.01) [−0.19, 0.17]
Americans (other)	1.39 [0.86, 2.25]	.00 (0.00) [−0.21, 0.21]
Age		
18–30	*Reference*	*Reference*
31–45	0.66 [0.46, 0.93]*	.02 (0.04) [−0.11, 0.20]
46–60	0.68 [0.48, 0.95]*	.01 (0.02) [−0.13, 0.18]
61–75	0.65 [0.46, 0.91]*	−.01 (−0.03) [−0.18, 0.13]
>75	0.49 [0.31, 0.78]**	.03 (0.13) [−0.08, 0.34]
Gender		
Female	*Reference*	*Reference*
Male	0.63 [0.53, 0.75]***	−.03 (−0.05) [−0.13 0.03]
Married		
No	*Reference*	*Reference*
Yes	1.29 [1.06, 1.56]*	.02 (0.04) [−0.05, 0.13]
Education		
No college	*Reference*	*Reference*
College	1.73 [1.38, 2.17]***	−.06 (−0.12) [−0.22, −0.01]*
Postgraduate	2.58 [1.90, 3.48]***	−.11 (−0.28) [−0.41, −0.14]***
Income		
Low	*Reference*	*Reference*
Low-Medium	1.24 [0.94, 1.65]	−.02 (−0.05) [−0.17, 0.08]
Medium	1.34 [1.00, 1.78]*	−.03 (−0.07) [−0.20, 0.06]
Medium-High	1.53 [1.09, 2.15]*	−.07 (−0.17) [−0.33, −0.02]*
High	2.02 [1.26, 3.24]**	−.04 (−0.16) [−0.36, 0.05]
Insurance		
No	*Reference*	*Reference*
Yes	0.89 [0.59, 1.35]	.01 (0.03) [−0.16, 0.21]
Psychological factors		
Perceived cancer risks	1.24 [1.12, 1.38]***	−.02 (−0.02) [−0.07, 0.03]
Cancer worry	1.40 [1.27, 1.53]***	−.11 (−0.10) [−0.14, −0.06]***
Cancer fatalistic beliefs		
Cause	1.00 [0.90, 1.12]	.03 (0.04) [−0.01, 0.09]
Consequence	0.88 [0.79, 0.97]*	.15 (0.15) [0.11, 0.20]***
Prevention	0.83 [0.75, 0.92]***	.19 (0.21) [0.16, 0.26]***

Note. For information seeking, cell entries are odds ratios with 95% confidence intervals in brackets. For information avoidance, cell entries are standardized regression coefficients with unstandardized regression coefficients in parentheses, and the 95% confidence intervals for unstandardized regression coefficients in brackets.
*p < .05; **p < .01; ***p < .001

Table 3. Psychological antecedents of cancer information acquisition among Chinese respondents (N = 3,080).

Characteristic	Information seeking (1 = Yes) OR [95% CI]	Information avoidance (5-point scale) β (B) [95% CI]
Demographics		
Race/Ethnicity		
Chinese (Han)	*Reference*	*Reference*
Chinese (other)	0.70 [0.28, 1.77]	.03 (0.29) [0.00, 0.58]
Age		
18–30	*Reference*	*Reference*
31–45	1.20 [0.90, 1.59]	.04 (0.08) [−0.01, 0.17]
46–60	1.11 [0.80, 1.53]	.11 (0.27) [0.17, 0.38]***
Gender		
Female	*Reference*	*Reference*
Male	1.20 [0.97, 1.47]	−.03 (−0.05) [−0.12, 0.02]
Married		
No	*Reference*	*Reference*
Yes	0.80 [0.60, 1.06]	.01 (0.02) [−0.07, 0.11]
Education		
No college	*Reference*	*Reference*
College	1.09 [0.85, 1.40]	−.01 (−0.03) [−0.11, 0.06]
Postgraduate	1.75 [1.08, 2.81]*	−.04 (−0.16) [−0.33, 0.00]*
Income		
Low	*Reference*	*Reference*
Low-Medium	0.61 [0.45, 0.82]***	.02 (0.06) [−0.04, 0.16]
Medium	0.57 [0.43, 0.77]***	.01 (0.03) [−0.07, 0.13]
Medium-High	0.66 [0.48, 0.89]**	.01 (0.02) [−0.08, 0.12]
High	0.82 [0.51, 1.31]	.02 (0.07) [−0.09, 0.23]
Insurance		
No	*Reference*	*Reference*
Yes	1.21 [0.80, 1.86]	−.03 (−0.11) [−0.25, 0.03]
Psychological factors		
Perceived cancer risks	1.42 [1.23, 1.64]***	.01 (0.01) [−0.04, 0.06]
Cancer worry	1.64 [1.47, 1.83]***	.06 (0.06) [0.02, 0.10]**
Cancer fatalistic beliefs		
Cause	1.53 [1.37, 1.72]***	.05 (0.05) [0.01, 0.09]**
Consequence	0.77 [0.70, 0.85]***	.05 (0.05) [0.01, 0.08]**
Prevention	1.00 [0.90, 1.12]	.23 (0.22) [0.19, 0.26]***

Note. For information seeking, cell entries are odds ratios with 95% confidence intervals in brackets. For information avoidance, cell entries are standardized regression coefficients with unstandardized regression coefficients in parentheses, and the 95% confidence intervals for unstandardized regression coefficients in brackets.
*p < .05; **p < .01; ***p < .001

Hypothesis 1 proposed that perceived cancer risk would be positively related to cancer information seeking among U.S. respondents. The odds ratio was 1.24 (p < .001). Therefore, H1 was supported. Hypothesis 2 proposed that perceived cancer risk would be negatively related to cancer information avoidance among U.S. respondents. The standardized regression coefficient was −.02 (p = .39). Thus, H2 failed to receive support.

Moreover, cancer worry was positively associated with cancer information seeking (OR = 1.40, p < .001) and negatively associated with cancer information avoidance (β = −.11, p < .001). Thus, both H3 and H4 received support.

Hypothesis 5 argued that cancer fatalistic beliefs would be negatively related to cancer information seeking for U.S. respondents. The odds ratios were 1.00 (p = .93) for the fatalistic belief about the cause of cancer, 0.88 (p = .01) for the fatalistic belief about the consequence of cancer, and 0.83 (p < .001) for the cancer-prevention fatalistic belief. Therefore, results supported H5. Hypothesis 6 maintained that cancer fatalistic beliefs would be positively related to cancer information avoidance for U.S. respondents. The standardized regression coefficients were .03 (p = .16) for the fatalistic belief about the cause of cancer, .15 (p < .001) for the fatalistic belief about the consequence of cancer, and .19 (p < .001) for the fatalistic belief about cancer prevention. Thus, H6 was also supported.

Regarding the Chinese sample, we first examined the relationship between perceived cancer risk and cancer information seeking (RQ1). Results showed that perceived cancer risk was positively associated with cancer information seeking for Chinese respondents (OR = 1.42, p < .001). Research question 2 centered on the association between perceived cancer risk and cancer information avoidance among Chinese respondents. Results revealed that perceived cancer risk was not associated with cancer information avoidance (β = .01, p = .47).

Research question 3 focused on the relationship between cancer worry and cancer information seeking. The odds ratio was 1.64 (p < .001) showing a positive relationship. Research

question 4 asked about the relationship between cancer worry and cancer information avoidance. The standardized regression coefficient was .06 (p = .002) also showing a positive association.

We also investigated the relationship between cancer fatalistic beliefs and cancer information seeking among Chinese respondents (RQ5). The odds ratios were 1.53 (p < .001) regarding the fatalistic belief about the cause of cancer, 0.77 (p < .001) regarding the fatalistic belief about the consequence of cancer, and 1.00 (p = .94) for the fatalistic belief about the prevention of cancer. For the relationship between cancer fatalistic beliefs and cancer information avoidance among Chinese respondents (RQ6). The standardized regression coefficients were .05 (p = .009) regarding the fatalistic belief about the cause of cancer, .05 (p = .006) regarding the fatalistic belief about the consequence of cancer, and .23 (p < .001) for the fatalistic belief about the prevention of cancer.

Discussion

This study used national health survey data from both the United States and China (2017 U.S. HINTS and 2017 China HINTS) to examine cancer risk perceptions, fatalistic beliefs, and worry as important psychological antecedents of cancer information seeking and avoidance in both countries. Findings revealed that while the U.S. and China shared some similarities in how cancer perceptions, beliefs, and emotions explain information seeking/avoidance, there were also important differences. Results have implications for understanding the generalizability of country-specific health communication findings and for promoting cancer information-seeking behaviors in different cultures.

Perceived cancer risks and cancer worry were positively associated with cancer information seeking for both U.S. and Chinese respondents. However, while cancer worry was negatively related to cancer information avoidance for U.S. respondents, cancer worry was positively associated with cancer information avoidance among Chinese respondents. Thus, there is strong evidence that U.S. respondents reacted to cancer worry proactively through more seeking of needed information, coupled with less avoidance. By comparison, findings were mixed for Chinese respondents. Higher cancer worry was associated with both cancer information seeking and avoidance behaviors. It is possible that Chinese people who were more worried about cancer actively looked for certain information and avoided others. For example, they may search for information that reduces their worry about cancer while avoiding information suggestive of a positive cancer diagnosis.

This pattern of results reflects the differences between individualists and collectivists in their response to cancer-related uncertainties. Individualists may be more likely to think of cancer uncertainties as opportunities to take timely preventive actions. They desire to detect cancer early and therefore are less likely to avoid cancer information (Chang & Asakawa, 2003; Douglas & Wildavsky, 1982; Hong, 1978). Furthermore, because individualistic cultures emphasize independence and self-reliability, people in such cultures are more likely to consider cancer information vital in their efforts to manage and control cancer risks (Bontempo et al., 1997; Heine & Lehman, 1995). By comparison, collectivists emphasize interdependence over individual autonomy, which may lead to reduced personal competence in taking proactive actions for health management (Triandis, 1994, 1995). Such a risk-averse mentality may further result in avoidance of cancer information (e.g., information that can evoke cancer worry) because higher levels of cancer worry are inherently against security-centered orientations (Hamilton & Biehal, 2005) and can thereby increase mental stress. Taken together, our results show that it might be a useful way to promote cancer information seeking through heightening people's awareness of their risks of cancer for both Americans and Chinese. A caveat to this recommendation, however, is that while increasing cancer worry might be effective to promote cancer information acquisition in the U.S., it may boomerang in the Chinese population. Thus, using highly emotional messages to trigger affective responses such as worry and anxiety about cancer may result in unintended outcomes when communicating cancer risk information in China.

About the relationships between fatalistic beliefs and cancer information acquisition, cancer fatalistic beliefs about the consequence and the prevention of cancer were positively associated with cancer information avoidance and negatively associated with cancer information seeking among U.S. respondents. By comparison, while the fatalistic belief about the consequence of cancer increased cancer information avoidance and decreased cancer information seeking among Chinese respondents, the fatalistic belief about the cause of cancer increased both cancer information seeking and avoidance. Therefore, while fatalistic beliefs were a powerful determinant of cancer information acquisition behaviors in both countries, they played a more complex role in China. Thus, our results showed that it might be safer to focus more on reducing the fatalistic beliefs regarding the consequences and preventions of cancer because reducing the fatalistic beliefs about cancer's causes may also reduce the likelihood of cancer information seeking among Chinese people.

Health communication related to cancer fatalistic beliefs in China revealed mixed results probably because fatalism in the Chinese cultural context might need to be more appropriately interpreted as fatalistic voluntarism (Cheng et al., 2013). The term captures the unique role of personal efforts/endeavors among fatalistic Chinese individuals. On the one hand, Chinese people acknowledge the uncontrollability of life events such as cancer. On the other hand, they are not completely passive in their responses. Instead, they may become motivated to deal with the problems proactively when facing adversities, diseases, and dangers in life in hope of better outcomes (Lee, 1995). Thus, while cancer fatalistic beliefs decreased cancer information seeking and increased avoidance in the U.S. (Kobayashi & Smith, 2016; Miles et al., 2008; Peng et al., 2019), beliefs of fatalistic voluntarism in China could lead to taking provocative actions while accepting the uncontrollability of the outcome. Such a mentality is consistent with Buddhist teachings, which run deep in Chinese people's way of thinking and culture. This phenomenon has also been observed in existing public health studies, although they did not specifically focus on information seeking as the outcome (Cheng et al., 2013; Chui & Chan, 2007; Heiniger et al., 2015).

Thus, findings from this study successfully extended such cultural insights to cancer information seeking and avoidance.

This study has the following limitations. First, although we specified cancer risk perceptions, worry, and fatalistic beliefs as antecedents of cancer information seeking and avoidance, we cannot be sure of the causal directions of these variables due to the cross-sectional nature of the 2017 HINTS data. Second, although we have controlled for a wide range of demographic variables, other variables not included may nevertheless confound or impact the results. Also, HINTS were not specifically designed for making across-culture comparisons. Hence, the wording of some questions might differ slightly between the U.S. and Chinese version of the survey. Third, compared to the Chinese sample, the U.S. sample has more elderly respondents, respondents who were not married, and respondents who received higher education. Fourth, future research might want to oversample specific racial/ethnic minority populations to see if findings can be replicated given that cancer mortality rates differed between racial and ethnic minority groups in the U.S. (National Cancer Institute, 2020). Finally, some perceptions and beliefs that may also affect cancer information acquisition were not included in 2017 HINTS questionnaires and thus were not tested in the current study. Future research can investigate other important antecedents of cancer information acquisition such as normative beliefs about cancer information seeking (Yang & Kahlor, 2012).

Notwithstanding these limitations, this study contributes to existing cancer communication research by examining perceived cancer risks, worry, and fatalistic beliefs as antecedents of cancer information seeking and avoidance in both the U.S. and China. Results indicated that U.S.-based findings may not generalize to China without major adaptations due to possible cultural differences between the two countries. As cancer has become a global public health challenge, cancer communication research needs to develop more culture-specific and country-tailored theories and models to effectively promote cancer information acquisition behaviors.

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