Information Sources, Credibility, Knowledge, and Risk Perceptions: Findings from the National Tuberculosis Survey in South Korea

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This study explores the sources of tuberculosis (TB) information used by Koreans, focusing specifically on how sociodemographic variables influence perceptions of source credibility and how the use of different information sources influences TB-related knowledge levels and risk perceptions. Based on the secondary cross-sectional data of the Korean National Tuberculosis Association, a series of analyses of variance and multiple regressions were conducted. The result showed that TV and the Internet are perceived as the most credible information sources, and that age, gender, and income predict credibility in different information sources. The TB-related knowledge was positively related to the use of TV/radio, interpersonal sources, and the Internet, whereas perceived susceptibility to TB was positively associated with the use of TV/radio and interpersonal sources. The findings suggest that health officers or public health campaign practitioners must understand their primary targets and select the most appropriate information sources to develop their campaigns.

Keywords: credibility, health communication, information source, knowledge, risk perception, South Korea, tuberculosis

According to the World Health Organization (WHO, 2021), tuberculosis (TB) is one of the most common communicable diseases in the world and a main cause of morbidity and mortality in developing countries. Until the COVID-19 pandemic, TB was the leading cause of death from a single infectious agent

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and ranked higher than HIV/AIDS. Tuberculosis bacteria do not always make people ill with TB; people infected with the bacteria only have a 10% risk of developing TB. However, TB spreads easily and quickly among people with weak immune systems, including among those with HIV, those who smoke, and those who suffer from malnutrition; therefore, most cases occur in developing countries. In 2020, about 5.8 million people developed TB, and 1.3 million lost their lives to the disease. Most cases occurred in low- or middle-income countries (WHO, 2021).

Despite the low incidence rate in developed countries, the TB incidence rate in South Korea has continuously increased and, as of 2020, was the highest among the Organization for Economic Cooperation and Development (OECD) countries, with a prevalence of 77 cases per 100,000 people. The mortality rate from tuberculosis is 2.6 per 100,000, the third highest among OECD countries (WHO, 2021). The country's TB vaccine coverage is very high; for example, the coverage rate is 96.7% among children born in 2012 (Kim, 2016). However, research has shown that the vaccine's effectiveness wanes over time (Hart & Sutherland, 1977). South Korea's TB incidence statistics resemble those of developing countries: Young adults in their 20s and 30s comprise 12.38% of all TB patients (Korea Disease Control and Prevention Agency, 2021). Meanwhile, a survey conducted by the Korean Ministry of Health and Welfare found that female college students have a higher infection rate than other groups (Park, 2013). Moreover, a number of high school students in one of the wealthiest areas, and many college students have been infected with this so-called disease of poverty (Ha, 2013). Researchers have suggested that malnutrition, excessive dieting, being underweight, and stress from studying and searching for jobs weaken the immune system of young adults, thereby increasing the prevalence of TB cases (Ha, 2013; Kim, 2013; Park, 2013, 2016). Considering that TB is a curable disease and many TB-related deaths are preventable through appropriate medical measures (WHO, 2023), the implementation of effective health communication strategies by public health officers or public health campaign practitioners could complement preventive efforts.

Access to health information is crucial for enhancing public health (Brodie, Kjellson, Hoff, & Parker, 1999) and understanding how different information sources reach target audiences, serve target audiences' needs, and transform their thoughts is a prerequisite for developing effective strategic health campaigns (Schooler, Chaffee, Flora, & Roser, 1998). However, extant research has examined the general use or perception of health information sources (e.g., Koch-Weser, Bradshaw, Gualtieri, & Gallagher, 2010; Redmond, Baer, Clark, Lipsitz, & Hicks, 2010), and context-specific empirical research remains insufficient. In the 20th century, health information sources were categorized as interpersonal—involving family, friends, colleagues, and healthcare providers—or mediated, such as TV, radio, and newspapers. However, with the advent of the Internet, the sources individuals use to obtain health information have expanded beyond traditional sources (Lewis, Shkter-Porat, & Nasir, 2022). To reflect these new ways in which individuals access health information, scholars have expanded their research to include different sources. Lewis and colleagues (2022), who reviewed health information-seeking research in major journals from 2010 to 2019, demonstrated the increasing diversity of sources used for health information seeking. Furthermore, TB is associated with stigmas such as poverty (Baral, Karki, & Newell, 2007), and TB-related information may, therefore, need to be disseminated using different communication sources from those used to communicate about other, less-stigmatized diseases. For example, people may find TB-related information in the mass media less relevant because of TB's strong link to poverty; it is therefore possible that interpersonal information sources are more effective in commutating this information's potential relevance. Meanwhile,

people may hesitate to visit health care providers if they fear getting diagnosed with TB and isolated from other people because of TB's contagious nature; in this case, anonymous access to information sources would be more effective. Indeed, scholars (Cline & Haynes, 2001; Dutta-Bergman, 2004; Redmond et al., 2010) have expressed concern about the scarcity of empirical research in this specific area.

To address this research gap, this study focuses on sociodemographics, the use of different information sources, credibility, knowledge, and risk perception. The comprehensive model of information seeking (CMIS) is an overarching theoretical framework that provides a causal structure to understand health information behavior (Johnson, 1997; Johnson & Meischke, 1993). A fundamental assumption of CMIS is that health-related factors such as sociodemographic influence information-carrier characteristics, which subsequently impact health-related behaviors. The comprehensive model of information seeking presents characteristics and utility as key components of information-carrier characteristics. Characteristics encompass the perceived credibility and intention of the information source. Utility refers to the perception that the information of source is relevant, important, and topical. Two concepts that many health information behavior studies have focused on in relation to these factors are the credibility of information sources and the use of different information sources (Ruppel, 2016). On the other hand, to reduce the number of TB cases, it is essential for more people to recognize the risk of TB and possess the necessary knowledge to take relevant measures when required (Ailinger, Lasus, & Dear, 2003; Marks, Deluca, & Walton, 2008). Therefore, understanding which information sources influence TB-related knowledge and risk perception is crucial. Consequently, this study first investigates which information sources Korean citizens trust and whether sociodemographic differences influence perceptions of source credibility. Second, it examines whether the use of different information sources affects people's TB-related knowledge and risk perceptions. By addressing these questions, this exploratory study aims to contribute to the field of health communication and provide practical insights for health campaigners that will help them select the most effective information sources to reach specific targets in the TB context.

Literature Review and Research Question Development

Credibility of Health Information Sources

People acquire health information from various sources including the mass media, interpersonal communication, and the Internet (Ford & Kaphingst, 2009; Rains, 2007; Tanis, 2008). Credibility in a given information source may motivate individuals to select and use the source when obtaining health information (Dutta-Bergman, 2004, 2005). According to CMIS, the credibility of the information source is a key factor influencing health-related behaviors (Johnson, 1997). The source credibility theory states that individuals are more likely to trust and accept information obtained from credible sources such that information has greater persuasive power and ability to impact the shaping of attitudes and behaviors (Hovland, Janis, & Kelly, 1953). Research has suggested that information source credibility plays a critical role in determining individuals' use of different information sources. Interpersonal information sources, including one's family and healthcare providers, are generally perceived as credible (Diaz et al., 2002; Hesse et al., 2005; Johnson & Meischke, 1992). Consequently, research has found that these sources are effective in reducing uncertainty around personal health concerns (Johnson & Meischke, 1992) and in affecting individuals' treatment decisions (Dolan, Iredale, Williams, & Ameen, 2004). In a study conducted in New Zealand to

assess the credibility of different sources of health information, Worsley (1989), found that formal sources of information such as doctors were perceived as the most credible. Following these were informal sources like family and friends, while mass media sources like TV, newspapers, and magazines had the lowest credibility. Using data from the Health Information National Trends Survey, Hesse and colleagues (2005) examined levels of credibility in various cancer information sources and found that physicians are the most trusted source of information, with 62.4% of participants saying that they trust their physicians "a lot." Compared with the Internet, which was the next most trusted source at 23.9%, around three times more people perceived physicians as credible. Meanwhile, credibility in Internet sources was somewhat divided: 23.9% trusted the Internet a lot, while 22.8% did not trust the Internet at all. These sources were followed by TV, family/friends, magazines, and newspapers, with radio as the least trusted health information source. This study's findings depart somewhat from general expectations: Information-oriented sources (e.g., newspapers and magazines) tend to contain more credible information than entertainment-oriented sources (e.g., TV and radio; Rains, 2007). Specifically, in the context of TB, no prior study has examined which source is perceived as credible for obtaining TB-related information. Thus, the following research question is posed:

RQ1:   *How do individuals perceive the credibility of different sources when seeking TB-related information?*

Sociodemographic Determinants of Information Source Credibility

Within CMIS, health-related factors such as sociodemographics are identified as antecedents of information-carrier characteristics, including the credibility of the information source (Johnson, 1997; Ruppel, 2016). Research (Brodie et al., 1999, 2000; Hesse et al., 2005; Viswanath & Ackerson, 2011; Worsley, 1989) has suggested that sociodemographic variables, including age, gender, education, income, and ethnicity, influence the perceived credibility of different health information sources. Worsley (1989) identified several sociodemographic differences in the perceived credibility of different sources of health information. For instance, younger age groups tended to assign higher credibility to informal sources like family and friends as well as to mass media such as TV and newspapers. According to Hesse and colleagues (2005), who analyzed data from the Health Information National Trends Survey of 6,369 U.S. adults, females, and younger adults generally perceive most health information sources, such as physicians, television, magazines, or newspapers, as more credible than their male and older adult counterparts. The study also revealed that those with higher levels of education are more likely to trust the Internet, newspapers, and magazines than those with lower levels of education. Another nationally representative survey of 5,187 U.S. adults (Viswanath & Ackerson, 2011) found that individuals with college diplomas are significantly more likely to trust doctors as sources of cancer information and less likely to trust TV and radio than individuals with less than high school education. Income was another determinant of the use of different health information sources. People with higher income levels were more likely to trust the Internet and less likely to trust family and friends when obtaining cancer information. Considering that no prior study has explored these questions in the context of TB, the following research question is posed:

RQ2:   *Do perceptions of source credibility differ depending on sociodemographic characteristics?*

The Influence of Information Sources on Knowledge Levels and Risk Perceptions

Some information sources have been found to be more effective in increasing health-related knowledge levels. For example, people who pay attention to health information in newspapers (Stryker, Moriarty, & Jensen, 2008) have been shown to have more knowledge of cancer prevention.

Information sources have also been shown to influence individuals' risk perceptions; however, the relationships have not been consistent. Kealey and Berkman (2010) found that individuals who accessed health information from the Internet and newspapers had lower cancer risk levels than the members of their reference group (i.e., peers) who did not. Moreover, those who obtained health information from the TV had a 33% lower chance of perceiving themselves as likely to have cancer than their reference group. Meanwhile, print media has been found to generally increase perceived health risks (Dutta-Bergman, 2004; Morton & Duck, 2001). Morton and Duck (2001) found that individuals who access information from newspapers perceived the risk of skin cancer as greater than others, while individuals who obtained information via interpersonal sources perceived themselves to be at greater personal risk of skin cancer. Some researchers (Kim, 2018; Nan, Verrill, & Kim, 2017) further divided the concept of risk perceptions into perceived susceptibility (the extent to which people believe they are likely to get a disease) and perceived severity (the extent to which people believe a certain disease is serious; Witte, 1996). Kim (2018) found that those who obtained HPV-related information from the print media including newspapers and magazines perceived HPV as more severe, whereas those who obtained such information from healthcare providers showed higher perceived susceptibility to HPV. Nan and colleagues (2017) also found that individuals who got food safety information from teachers, healthcare providers, and the Internet showed greater levels of perceived susceptibility to and severity of foodborne illness and food contamination. Newspapers also increased readers' perceived susceptibility to foodborne illness, but interestingly, friends, family, and social media use decreased levels of perceived susceptibility to foodborne illness. Thus, the following research question is posed to examine how knowledge and risk perceptions are affected by the use of different information sources.

RQ3:   Does the use of different information sources affect knowledge levels and risk perceptions?

By exploring which information sources Korean citizens trust, this study examines determine whether sociodemographic characteristics affect source credibility and whether using different information sources influences Korean citizens' knowledge and risk perceptions related to TB; in so doing, it aims to enhance scholarly knowledge in the field of health communication and provide practical insights for health campaigners.

Methodology

Participants and Procedure

This cross-sectional study uses secondary data from the Korean National Tuberculosis Association (KNTA). This survey, which targeted a panel, was conducted for research purposes by a research company in 2010–2011 in response to a request from the KNTA. This panel, owned and

managed by the research company, comprised individuals from diverse backgrounds and may not have necessarily consisted solely of donors or supporters of the KNTA. A total of 1,500 people older than 13 years of age residing in one of the five major cities in South Korea participated in the survey. A quota sampling strategy based on age, gender, and region was employed, and the data were collected via an online survey. Of the total data, 93 respondents who did not complete responses to key measures were excluded from this study (93.8% response rate), as well as 279 respondents younger than 20 years, as this study investigates the impact of sociodemographic variables that do not apply to this age group, such as income and education on information source use. The final sample for this cross-sectional study consisted of 1,128 responses.

Key Measures

Table 1 presents all the items and reliability coefficients for the key measures.

TB-Related Knowledge

The TB-related knowledge was assessed using 32 items explaining TB. The items were initially developed based on TB-related information provided by the Korean National Tuberculosis Association. Additionally, items from prior research (Jaramillo, 1999; Storla, Yimer, & Bjune, 2008) were adapted to develop the final set of items. Subjects were asked to indicate the extent of their knowledge for each statement on a 3-point scale (1 = *I do not know*; 2 = *I know a little*; 3 = *I know*). Their responses were then summed to generate total individual scores for TB-related knowledge, which were used in the analysis to test the research question ($M = 56.08$, $SD = 15.02$, Cronbach's $\alpha = .95$).

Perceived Susceptibility

Perceived susceptibility was assessed with six items. Subjects were asked to rate on a four-point Likert scale, ranging from 1 = *strongly disagree* to 4 = *strongly agree*, the degree to which they agreed with each statement. Participants' responses to the six items were averaged to create an index for perceived susceptibility ($M = 2.36$, $SD = .48$, Cronbach's $\alpha = .82$).

Perceived Severity

Perceived severity was assessed with three items. Subjects were asked to rate on a four-point Likert scale, ranging from 1 = *strongly disagree* to 4 = *strongly agree*, the extent to which they agreed with each statement. Participants' responses to the three items were averaged to create an index for perceived severity ($M = 2.47$, $SD = .59$, Cronbach's $\alpha = .80$).

Use of Information Sources

Use of information sources was measured with one item: "Through which source (media) have you encountered information about TB?" Subjects were asked to choose the source (media) through which they had encountered information about TB. The information sources included TV, radio,

newspapers, the Internet, government-sponsored PSAs in print form such as flyers or posters, magazines, family, friends/colleagues/teachers, doctors, TB-specialist websites, public transportation, blood centers, and so on.

Source Credibility

Source credibility was assessed with one item for each of the 10 information sources. Subjects were asked to rate on a four-point Likert scale, ranging from 1 = *not at all* to 4 = *to a great extent*, the extent to which they perceived each information source as credible for obtaining TB-related information. Information sources included TV, radio, newspaper, the Internet, print public service announcements (PSAs), magazines, family, friends/colleagues/teachers, doctors, and TB-specialist websites.

Sociodemographic Information

The sociodemographic information requested from the participants included age, gender, education, and income. Age was recoded into two categories: below 45 (coded as 0) and 45 and over (coded as 1), following prior studies (Nan et al., 2017) and incorporating the categories used in reports on communication source uses (File & Ryan, 2014; Jones & Fox, 2009; Otman, Velkoff, & Hogan, 2014). Specifically, research has shown that these two groups have different TB incidence patterns in South Korea; the TB incidence among those aged 45 and above has increased whereas the incidence among those younger than 45 has decreased (Yoo, 2013). Male was coded as 0 and female as 1. Education initially had five subcategories and income had eight subcategories. To facilitate data analyses and make sense of the results, these subcategories were regrouped with the descriptive statistics as shown in Table 2.

Table 1. Key Measures and Descriptive Statistics.

TB-related Knowledge (M = 56.08, SD = 15.02, Cronbach's α = .95)

- TB is the first infectious disease to require mandatory reporting.
- TB is not transmitted through phlegm, saliva, or skin-to-skin contact with infected people.
- TB is not transmitted through touching items such as towels, spoons, or dishes used by infected people.
- TB is transmitted through the respiratory system such as the lungs or airways.
- TB is rarely transmitted after two weeks of taking TB drugs.
- People infected with TB are not TB patients who need TB treatment.
- One-third of the world population is infected with TB.
- Super extensively drug-resistant tuberculosis (XDR-TB) refers to TB that is difficult to treat because of the resistance to TB drugs.
- XDR-TB is a refractory disease that is difficult to cure and requires long-term treatment.
- Mycobacterium tuberculosis dies when exposed to ultraviolet rays (sunlight).
- TB infection can be prevented by ventilation.
- BCG vaccination given in infancy is effective only for preventing TB in children.

• BCG vaccination is not effective for adults.
• X-ray screening is a means of early TB diagnosis.
• An examination of tubercle bacilli is available for early TB diagnosis.
• A TB skin test is a means of TB diagnosis.
• Cough or phlegm lasting longer than two weeks is a sign of TB infection.
• Hemoptysis is a sign of TB infection.
• Continued mild fever and weight loss is a sign of TB infection.
• Infected people should take TB drugs for at least six months even if related symptoms disappear.
• TB is a tough disease and curing it requires a minimum of six months' treatment.
• TB is a highly risky disease that can lead to death if not properly treated.
• I can get TB in spite of myself.
• Once developed, TB can last for a lifetime.
• Korea has the highest TB incidence and mortality rates among OECD countries.
• Korea shows the highest ratio of multidrug-resistant tuberculosis patients among OECD countries.
• The TB incidence rates for those in their late teens to 30s are high in Korea.
• The TB incidence rates for men are higher than for women.
• BCG is the vaccine that prevents TB.
• Public health centers provide free medical treatment for TB.
• The Korean government aids in the treatment of TB patients and in screenings for their family members.
• Underprivileged TB patients can get financial support from the Korean government for a few months.
Perceived Susceptibility (M = 2.36, SD = .48, Cronbach's α = .82)
• I am highly likely to develop TB.
• It is easy for Koreans to get TB.
• My friends, colleagues, and people around me are highly likely to develop TB.
• The spread of TB is serious in Korea.
• People with TB can easily transmit it.
• My family members are highly likely to develop TB.
Perceived Severity (M = 2.47, SD = .59, Cronbach's α = .80)
• TB is difficult to treat.
• Infected people are at a great risk of death.
• TB is a painful disease.

Table 2. Sample Sociodemographics.

Variables	Frequency	Percentage
Age		
Under 45	735	65.2
45 and over	393	34.8
Gender		
Female	567	50.3
Male	561	49.7
Education		
Less than bachelor's degree	317	28.1
Bachelor's degree and above	811	71.9
Annual Income		
Less than $10,000 (₩12 million)	29	2.6
$10,000–$30,000 (₩12–36 million)	353	31.3
$30,000–$50,000 (₩36–60 million)	478	42.4
More than $50,000 (₩60 million)	268	23.8

Note. N = 1,128. $ = United States dollar (USD). ₩ = Korean won (KRW).

Data Analyses

Data were analyzed using IBM SPSS Statistics package version 25. To answer RQ1, descriptive statistics were examined. To examine RQ2, a series of ANOVAs were conducted with age, gender, education, and income as the independent variables and the perceived credibility of the different information sources as the dependent variables. To examine RQ3, four multiple regression analyses were performed. First, sociodemographic variables, including age, gender, education, and income, were entered as covariates, to control for their potential influences on knowledge levels and risk perceptions. Next, key variables—whether individuals obtained TB-related information from each of information source—were entered as the independent variables. The TB-related knowledge, perceived susceptibility, and perceived severity were the dependent variables. Statistical significance was set at the alpha levels of .05, .01, and .001.

Results

RQ1 asked which sources participants perceived as credible when seeking TB-related information. As Table 3 shows, Korean citizens perceived doctors as the most credible source of information (M = 3.70, SD = .53), followed by TB-specialist websites (M = 3.66, SD = .58); TV (M = 3.37, SD = .59); newspapers (M = 3.21, SD = .63); and friends, colleagues, and teachers (M = 3.70, SD = .53); meanwhile, print PSAs (M = 2.95, SD = .73) and magazines (M = 2.72, SD = .67) were found to be the least credible sources.

RQ2 asked whether participants' perceptions of source credibility differed depending on their sociodemographic characteristics. As Table 4 shows, the results reveal that age, gender, and income predicted the perceived credibility of different information sources. In particular, age affected the perceived credibility of several information sources. Compared with younger people, older people perceived radio

($F_{1,1126}$ = 6.45, p = .011), newspapers ($F_{1,1126}$ = 11.20, p = .001), the Internet ($F_{1,1126}$ = 4.67, p = .031), family ($F_{1,1126}$ = 8.90, p = .003), and friends/colleagues/teachers ($F_{1,1126}$ = 10.25, p = .001) as more credible. Gender was another variable that predicted the perceived credibility of different information sources. Generally, women tended to find information sources more credible than men did. Compared with men, women perceived newspapers (F1,1126 = 5.85, p = .016), print PSAs ($F_{1,1126}$ = 11.53, p = .001), magazines ($F_{1,1126}$ = 10.97, p = .001), and friends/colleagues/teachers ($F_{1,1126}$ = 13.34, p = .000) as more credible. Income also predicted the perceived credibility of information sources, including radio ($F_{1,1126}$ = 5.38, p = .001) and newspapers ($F_{1,1126}$ = 4.35, p = .005). A *post hoc* Tukey-Kramer test indicated that the \$10,000–\$30,000 income group (M = 3.10, SD = .60) perceived radio as less credible than both the \$30,000–\$50,000 income group (M = 3.23, SD = .57, p = .005) and the above \$50,000 income group (M = 3.22, SD = .59, p = .049). The lowest income group (M = 2.97, SD = .82) did not differ significantly from the other groups. On the other hand, the lowest income group (M = 2.90, SD = .67) perceived newspapers as less credible than both the \$30,000–\$50,000 income group (M = 3.23, SD = .60, p = .024) and the above \$50,000 income group (M = 3.26, SD = .66, p = .015). Interestingly, education did not affect perceptions of source credibility.

RQ3 asked if the use of different information sources affects knowledge levels and risk perceptions. Preliminary data analyses showed that Korean citizens had obtained TB-related information from the following sources: TV (15.1%); Internet (10.4%); newspapers (6%); government-sponsored PSAs in print form such as flyers or posters (4.1%); friends, colleagues, and teachers (3.9%); doctors (3.5%); family (2%); magazines (1.3%); radio (1.3%); blood centers (.3%); and public transportation (.1%). Considering the limited utilization of some sources in obtaining TB-related information, these sources were categorized into five groups to facilitate additional meaningful exploration of the sources related to the RQ3: (1) electronic media, including TV and radio; (2) print media, including newspapers and magazines; (3) the Internet; (4) interpersonal communication, including communication with family, friends/colleagues/teachers, and doctors; and (5) government-sponsored PSAs via posters/leaflets, public transportation, and blood centers. As shown in Table 5 the use of different information sources is associated with a number of the proposed dependent variables. The TB-related knowledge is positively associated with the use of all the information sources (TV/radio: β = .154, SE = 1.439, t = 4.453, p < .001; newspaper/magazines: β = .078, SE = 1.892, t = 2.509, p < .05; Internet: β = .117, SE = 1.500, t = 3.688, p < .001; interpersonal communication: β = .110, SE = 1.521, t = 4.022, p < .001; government-sponsored PSAs: β = .070, SE = 2.009, t = 2.534, p < .05). Perceived susceptibility is also positively related to the use of TV, radio (β = .087, SE = .051, t = 2.262, p < .05), and interpersonal information sources (β = .067, SE = .054, t = 2.196, p < .05). On the other hand, the analysis showed no associations between perceived severity and any of the information sources.

Table 3. Means and Standard Deviations of Perceived Credibility Toward Information Sources Depending on Sociodemographic Variables.

	TV		Radio		News[a]		Internet		Print PSAs		Mag[b]		Family		Friends etc.[c]		Doctors		TB websites[d]	
Variables	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Age																				
Under 45	3.35	.61	3.15	.60	3.16	.63	2.97	.59	2.93	.75	2.70	.69	2.99	.66	2.93	.66	3.68	.55	3.65	.60
Above 45	3.41	.56	3.24	.58	3.29	.61	3.05	.60	3.00	.70	2.75	.62	3.11	.62	3.06	.62	3.74	.48	3.67	.55
Gender																				
Male	3.36	.62	3.19	.62	3.16	.66	2.97	.61	2.88	.77	2.65	.68	3.00	.66	2.90	.66	3.68	.57	3.63	.63
Female	3.39	.57	3.17	.57	3.25	.59	3.03	.57	3.03	.69	2.78	.64	3.07	.63	3.04	.63	3.72	.48	3.69	.52
Education																				
Less than bachelor	3.39	.57	3.15	.59	3.16	.64	2.97	.61	2.91	.77	2.69	.68	3.06	.64	3.00	.63	3.73	.47	3.67	.58
Bachelor and above	3.37	.60	3.19	.60	3.22	.62	3.01	.59	2.97	.72	2.73	.66	3.02	.65	2.97	.66	3.69	.55	3.65	.58
Annual Income																				
Below $10,000	3.21	.56	2.97	.82	2.90	.67	3.00	.66	2.72	.84	2.66	.77	3.07	.59	3.03	.63	3.59	.68	3.62	.68
$10,000–$30,000	3.34	.62	3.10	.60	3.15	.62	2.97	.60	2.90	.72	2.65	.67	2.99	.65	2.93	.64	3.70	.53	3.61	.63
$30,000–$50,000	3.41	.57	3.23	.57	3.23	.60	3.02	.57	3.00	.71	2.74	.64	3.06	.61	2.98	.64	3.70	.52	3.68	.54
above $50,000	3.37	.61	3.22	.59	3.26	.66	2.98	.62	2.96	.78	2.77	.69	3.04	.72	3.01	.68	3.72	.53	3.68	.56
Total	3.37	.59	3.18	.60	3.21	.63	3.00	.59	2.95	.73	2.72	.67	3.03	.65	2.97	.65	3.70	.53	3.66	.58

Note. N = 1,128. [a] Newspaper. [b] Magazines. [c] Friends/colleagues/teachers. [d] TB-specialist websites. $ = USD.

Table 4. Perceived Credibility of Information Source Depending on Sociodemographic Variables.

Variables	Age		Gender		Education		Income	
	F	P	F	p	F	p	F	p
TV	2.62	.116	.48	.490	.24	.623	1.83	.141
Radio	6.45*	.011	.13	.723	1.08	.299	5.38***	.001
Newspapers	11.20***	.001	5.85*	.016	1.95	.163	4.35**	.005
Internet	4.67*	.031	2.94	.087	.78	.378	.57	.632
Print PSAs	2.74	.098	11.53***	.001	1.40	.237	2.09	.100
Magazines	1.32	.252	10.97***	.001	.82	.367	1.80	.145
Family	8.90**	.003	3.36	.067	.56	.454	1.00	.390
Friends/colleagues/teachers	10.25***	.001	13.34***	.000	.53	.466	1.11	.345
Doctors	3.07	.080	1.51	.219	1.40	.237	.53	.660
TB-specialist websites	.20	.654	3.46	.063	.08	.776	1.05	.370

Note. N = 1,128.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5. Information Sources as Predictors of TB Knowledge and Risk Perceptions.

Variables	TB-related Knowledge			Perceived Susceptibility			Perceived Severity		
	β	SE	t	β	SE	t	β	SE	t
Constant			16.807			24.497			20.653
Age	.279***	.835	10.553	.129***	.030	4.385	−.042	.037	−1.380
Gender	.030	.792	1.122	.004	.028	.130	.010	.035	.334
Education	−.003	.903	−.127	−.014	.032	−.456	.007	.040	.213
Income	.091***	.512	3.354	.002	.018	.051	.020	.023	.649
TV/radio	.154***	1.439	4.453	.087*	.051	2.262	.056	.064	1.420
Newspaper/magazines	.078*	1.892	2.509	.028	.067	.805	.024	.084	.682
Internet	.117***	1.500	3.688	.060	.053	1.700	.014	.067	.376
Interpersonal	.110***	1.521	4.022	.067*	.054	2.196	−.025	.068	−.792
Government	.070*	2.009	2.534	.020	.072	.643	.013	.089	.414

Note. $N = 1{,}128$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

This study identified the TB-related information sources that Korean adults trust and examined whether sociodemographic characteristics influence the credibility individuals place in these sources. In addition, it explored where people obtain TB-related information to determine how different information sources affect TB-related knowledge levels and risk perceptions. The study's findings support prior studies showing that people's credibility varies depending on information sources. Like previous studies, this study's analyses revealed that people generally view healthcare providers as the purveyors of the most credible information (Diaz et al., 2002; Hesse et al., 2005; Johnson & Meischke, 1992). Rains (2007) found that people's credibility on the Internet falls into two categories: either high or no credibility. The findings of this study indicate that people have high levels of credibility in TB-specialist websites, implying that people trust expertise-based websites while they may distrust other Internet sources such as blogs and forums. Inconsistent with the general expectation that entertainment media such as TV would be less credible than informational media such as newspapers or magazines, this study confirmed Rains's (2007) finding that TV elicited more credibility than information-oriented sources. Interestingly, people did not have high levels of credibility in government-sponsored PSAs.

Prior studies have suggested that credibility in a given information source does not lead to actual use of that source (Brodie et al., 1999; Rains, 2007). Similarly, the current study revealed a gap between people's credibility in and actual use of information sources. In particular, while participants indicated that they perceived doctors as highly credible, they also reported that they rarely communicated with them to obtain TB information. In general, however, they used less credible information sources less frequently to obtain TB information. For example, TV and the Internet were trusted and frequently used for TB information, while the other sources were neither highly trusted nor frequently used. This seems to reflect people's general media use patterns. According to a recent Korea Media Panel Survey (Korea Information Society Development Institute, 2021), TV is the most used medium followed by mobile phone and computer, and this pattern has been consistent for the past decade. It is possible that other characteristics of information sources, such as accessibility, availability, and familiarity, may play a more significant role in individuals' selection of information sources than credibility. In this study, however, the relationship between the characteristics of a particular information source and the use of that source was not directly tested. Therefore, this discrepancy should be interpreted with even more caution, and further research is needed. Health communicators still need to understand when and why specific information sources are used and considered more credible to develop more effective communication strategies.

The study further revealed that sociodemographic variables influence perceptions of source credibility. Consistent with Hesse et al.'s (2005) findings, our analyses revealed that younger people and women generally perceived most information sources as more credible than older people and men did. In addition, people with higher income levels tended to trust newspapers and the radio more often than people with lower incomes. According to Anderson (2018), people with higher income levels tend to use newspapers more than those with lower income levels. In the lowest income bracket (less than $25,000 per year), around one-third of respondents (32.5%) never read newspapers, while approximately half (51%) of those with the highest income (more than $150,000 per year) were identified as daily newspaper readers. Also,

according to a report by the American Press Institute (2016), people with higher incomes tend to apply stricter principles such as accuracy, balance, and completeness when evaluating news sources. Newspapers provide more complete and detailed information than other information sources such as TV, which may explain why high-income individuals view them as more credible. In terms of radio usage, it is unclear why individuals with higher income levels tend to trust the radio. One possible explanation is that those who own cars may listen to and trust radio news. The KISDI STAT Report (Park, 2015) indicated that people most frequently listen to the radio in their cars (65.3%), and it is likely that individuals with higher incomes tend to have more resources to purchase cars. In turn, they become more familiar with these information types, which further facilitate their trust in these sources. Still, the current study does not provide clear answers to the question of why different age, gender, and income groups show different perceptions of source credibility; answering this question will require additional research.

In general, the findings of this study imply that different communication sources need to be used to reach different the primary targets. The analysis showed TV and the Internet to be the most frequently used and credible sources of TB information, and thus, these sources are deemed appropriate sources for reaching a broad audience. Information sources other than newspaper and radio are likely more effective for reaching less wealthy groups, since people in these groups are less likely to use and trust information-oriented sources. In addition, developing credible communication messages seems to be most critical when trying to reach older people and men, since these groups are less likely to obtain and trust health information from most sources.

One of this study's major contributions is that the use of different information sources influences TB-related knowledge levels and risk perceptions. Consistent with prior research (Stryker et al., 2008), this study revealed positive relationships between TB knowledge levels and the use of TV/radio, interpersonal sources, newspapers/magazines, government sources, and the Internet.

Differential use of TB-related information sources was also associated with perceived risk. Specifically, those who used TV/radio and interpersonal information as sources showed higher levels of perceived susceptibility to TB, supporting prior studies (Kim, 2018; Morton & Duck, 2001). Prior research has shown that print media increases levels of perceived risk of contracting a disease (Dutta-Bergman, 2004; Kim, 2018; Morton & Duck, 2001; Nan et al., 2017), but the current study found no relationship between print media and risk perceptions. TV and interpersonal sources may have positive relationships with perceived susceptibility to TB as a result of their vivid representations of the disease. Meanwhile, in the TB context, print media may not have been sufficiently evocative to increase risk perceptions because of the generally low levels of perceived susceptibility to TB. It is possible that people generally consider TB irrelevant to them until they hear about it from someone or encounter some visually eye-catching information on TV and recognize the potential relevance of the issue. More sensational visual-based rhetoric may be necessary to enhance risk perceptions about diseases involving low-risk perceptions. Still, why TV and interpersonal information sources, but not print media, are associated with perceived TB risk remains unclear and requires further research.

Using secondary cross-sectional data on 1,128 Korean citizens, this study investigates the credibility of information sources, knowledge, and risk perception in the context of TB. The findings suggest

that people's sociodemographic characteristics influence the degree to which they trust different information sources. Moreover, the study's analyses show that the use of different information sources affects people's TB-related knowledge and risk perceptions.

Limitations and Future Research Directions

No study is without limitations. The generalizability of this study is limited because it focused on the use of information sources for obtaining TB information. Since general data about how Korean adults use various information sources are not available, whether the findings of the current study are TB-specific or resemble source use patterns in other contexts (e.g., general health information or cancer information) remains unclear. In other words, although the TB incidence rate has increased over the past decade, people or society as a whole may be unaware of its seriousness. For example, only 15.1% of participants used TV—the most used information source—to obtain TB information. In short, whether such low exposure is because of the relatively low TB incidence rate or people's general lack of interest in health is unclear. Thus, future studies should investigate how information source use differs for different health problems. Also, as a cross-sectional study, this study's ability to identify causal relationship between the variables was limited. Future studies should test the causality between the use of various sources and TB-related knowledge levels and risk perceptions. Lastly, the current study employed secondary cross-sectional data and, therefore, could not control the knowledge measure. Based on a self-reported response, the measure could be biased because it asked subjects if they knew the presented TB-related information. Whether subjects actually had such TB-related knowledge or simply believed they did remain unclear. Future studies should employ a more direct knowledge measure such as asking subjects to answer to a series of true/false questions.

Practical Implications

This study has practical implications for health communicators. First, the findings suggest that health communicators need to understand their primary targets and select the most appropriate information sources for developing their campaigns. People's levels of credibility in information sources varied based on their socioeconomic status. Health communicators need to employ sources that can more effectively communicate with their primary targets. Second, health communicators need to consider the difference between actually used sources and credible sources when developing communication plans. This study found that healthcare providers were perceived as highly credible, but they were not commonly used to obtain TB-related information. New forms of information sources, such as an Internet chat room with healthcare providers, may function as a highly credible and easily accessible and used source of information. Third, health communicators are advised to employ various sources when communicating disease-specific information, but to employ nonprint media when trying to alert people about a disease and its associated risks. The current study revealed positive associations between the use of most information sources and TB-related knowledge, but it did not show associations between risk perceptions and either use of print media or use of the Internet. This again highlights the point that health communicators need to strategically match the media they use with their health communication goals.

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