

Use of Social Media in Health Communication: Findings From the Health Information National Trends Survey 2013, 2014, and 2017

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Abstract

The number of social media users has increased substantially in the past decade, creating an opportunity for health-care professionals and patients to leverage social media for health communication. This study examines the recent use and predictors of social media for health communication in a nationally representative sample of US adults over time. We used 2013, 2014, and 2017 National Cancer Institute's Health Information National Trends Survey to identify respondents' use of social media for sharing health information or exchanging medical information with a health-care professional. We conducted bivariate analysis using the Pearson χ^2 test to assess the association of respondents' basic demographic characteristics as well as health status and the use of social media for health communication. We performed multivariable logistic regression models to examine factors associated with the use of social media for health communication. We identified 4242 respondents (weighted sample size: 343 465 241 [2-year pooled sample]) who used social media for sharing health information and 4834 respondents (weighted sample size: 354 419 489 [2-year pooled sample]) who used social media for exchanging medical information. Multivariable analyses indicated the proportion of respondents who used social media for sharing health information has decreased (odds ratio [OR], 0.65; 95% confidence interval [CI], 0.49-0.85, $P = .002$), while the use of social media for exchanging medical information with a health-care professional has increased (OR, 1.88; 95% CI, 1.09-3.26, $P = .025$). The younger population had significantly higher odds of using social media for health communication. The study found no racial/ethnic disparities in the use of social media for health communication. Use of social media for sharing health information has declined, while exchanging medical information with health-care professionals has increased. Future research is needed to determine how to engage the population in social media-based health interventions, particularly for older adults.

Keywords

social media, cancer, communication, health information, knowledge

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Introduction

Use of social media has grown rapidly in the past 10 years. Currently, the monthly worldwide active users of 2 major social media platforms, Facebook and Twitter, have reached 2.20 billion and 336 million, respectively.¹ The total number of users of all major social media platforms is predicted to be 3.02 billion by 2021.² In the United States, the number of social media users is estimated to exceed 210 million in 2018,³ more than 4 times the number of social media users 10 years ago in

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2009.⁴ With such a high penetration rate, social media offers many opportunities for health care. Studies have reported several uses of social media by health-care providers, such as dissemination of health information,⁵⁻⁷ monitoring of disease pandemics,^{8,9} health promotion,^{10,11} recruitment of clinical study participants,¹²⁻¹⁴ and social media-based health interventions.¹⁵⁻¹⁷

Although there have been a number of studies examining health-care providers' use of social media in health care, less is known about the general population's health-related social media use. A recent study surveying social media users found 4 primary reasons for health-related social media use: (1) to gain knowledge about their diagnosed disease; (2) to obtain advice from other patients with the same disease; (3) to receive social support; and (4) to communicate with a physician.¹⁸ The study also reported many barriers to health-related social media use in the general population, such as privacy concerns, unreliability of information, low perceived need, and inefficiency.¹⁸ It is unknown whether increased needs of social media in health communication have improved the use of social media, or these reported barriers have prevented the more widespread use of social media. To date, many of the studies examining population use of social media have been cross-sectional; therefore, it is unclear how the use of social media for health communication has changed over time. Given that the number of social media users is changing over time, it is important to understand whether the use of social media for health communication is also changing over time.

To address this gap, our study sought to determine the temporal trend and predictors of social media use for health communication, including sharing health information (general public forums) and exchanging medical information with health-care professionals (patient-provider forums) in a nationally representative sample of US adults. We also aimed to examine the association between survey respondent's characteristics and temporal trends in use of social media. We hypothesized that the proportion of respondents who shared health information directly on a social media platform has decreased over time. Further, we hypothesized that the use of social media as a tool to exchange medical information with health-care professionals has not been impacted by privacy concerns because the public perceives health-care professionals as privacy aware. Because of the role of the health-care provider as an expert and trusted entity in providing advice on health-related issues and interpreting health-related information, another goal of our study was to examine the use of social media in health communication between patients and providers by comparison of these 2 types of social media use for health communication in general public forums versus patient-provider forums.

Methods

Data

This study used data from the National Cancer Institute's (NCI's) Health Information National Trends Survey (HINTS)

administered by the NCI's Division of Cancer Control and Population Sciences. The HINTS collects nationally representative data about the changes in the rapidly evolving field of health communication through different communication channels. The HINTS data used a well-constructed sampling frame that collects data from all nonvacant residential addresses in the United States. The sampling frame of addresses was grouped into areas with high concentrations of minority population and areas with low concentrations of minority population, so HINTS can oversample the high-minority stratum to increase the precision of estimates for minority subpopulations. The full-sample weights in the survey can be used to provide valid inferences from the responding sample to the population. In this study, we used HINTS 4 Cycle 3 (2013), HINTS 4 Cycle 4 (2014), and HINTS 5 Cycle 1 (2017) data sets, since the questions about sharing health information through social media were collected in the years 2013 and 2017, and the questions about use of social media for exchanging medical information with health-care professionals were collected in the years 2013 and 2014. The 2013 cycle 3 survey data was collected from September 2013 through December 2013; the 2014 cycle 4 data were collected from August through November 2014; and the 2017 cycle 1 data were collected from January 25 through May 5, 2017.

Study Population

The study includes 2 study samples (Supplemental Table 1). The first sample completed the HINTS 4 cycle 3 and cycle 4 surveys to assess the use of social media for sharing health information. A total of 6470 respondents answered these 2 surveys. Respondents were excluded from the study if the question about social media use for sharing health information was not answered ($n = 963$) or if basic demographic information was missing, including age, sex, race, education, marital status, income, employment, and region ($n = 1111$). Respondents were also excluded if the health-related information was not reported, including health insurance, health status, smoking status, or cancer history ($n = 154$). The final first study sample included 4242 respondents (weighted sample: 343 465 241)—which pools 2013 and 2014 data. The second sample completed the HINTS 4 cycle 3 and HINTS 5 cycle 1 surveys to assess use of social media for exchanging medical information with a health-care professional. A total of 6862 respondents answered these 2 surveys. Respondents were excluded from the study if basic demographic information (as described earlier) was missing ($n = 1793$). Respondents were also excluded if health-related information was not reported ($n = 235$). The final second study sample included 4834 respondents (Weight sample: 354 419 489)—which pools 2013 and 2017 data.

Study Variables

Health communication using social media. The 2 dependent variables measuring social media use for health communication (eg, health information sharing and medical information

Table 1. Sociodemographic Characteristics of Survey Respondents.

	Health Information Share, N = 4242, Weighted N=343 465 241 (2-year pooled sample)		P Value	Medical Information Exchange, N = 4834, Weighted N=354 419 489 (2-year pooled sample)		P Value
	Yes	No		Yes	No	
Unweighted population	733	3509		136	4698	
Weighted population	67 220 218	276 245 023		10 408 315	344 011 175	
Characteristics	No. (Col, %)	No. (Col, %)		No. (Col, %)	No. (Col, %)	
Year						
2013	364 (24.7)	1365 (75.3)	<.001	45 (2.0)	2106 (98.0)	.025
2014	-	-		91 (3.8)	2592 (96.2)	
2017	369 (15.7)	2144 (84.3)		-	-	
Age-group						
18-49	471 (26.4)	1257 (73.6)	<.001	70 (3.5)	1874 (96.5)	.022
50-64	192 (11.6)	1294 (88.4)		45 (2.4)	1655 (97.6)	
65+	70 (5.5)	958 (94.5)		21 (1.5)	1169 (98.5)	
Sex						
Male	210 (13.7)	1534 (86.3)	<.001	47 (2.7)	1904 (97.3)	.518
Female	523 (25.4)	1975 (74.6)		89 (3.2)	2794 (96.8)	
Race/Ethnicity						
Non-Hispanic white	442 (20.0)	2258 (80.0)	.735	67 (2.5)	2829 (97.5)	.573
Non-Hispanic black	88 (17.1)	480 (82.9)		26 (3.3)	717 (96.7)	
Hispanic	129 (18.5)	492 (81.5)		28 (4.1)	787 (95.9)	
Other	74 (20.4)	279 (79.6)		15 (4.2)	365 (95.8)	
Education						
Less than high school	21 (11.0)	185 (89.0)	.018	9 (2.2)	354 (97.8)	.599
High school graduate	95 (16.4)	596 (83.6)		19 (2.1)	880 (97.9)	
Some college	248 (23.5)	1034 (76.5)		46 (3.6)	1448 (96.4)	
College or higher	369 (19.2)	1694 (80.8)		62 (3.0)	2016 (97.0)	
Marital status						
Single	141 (20.8)	574 (79.2)	.022	31 (3.5)	815 (96.5)	.680
Divorced/widowed/separated	153 (13.9)	918 (86.1)		38 (2.5)	1338 (97.5)	
Married	439 (20.3)	2017 (79.7)		67 (2.8)	2545 (97.2)	
Family income						
Less than US\$20 000	125 (20.1)	537 (79.9)	.960	36 (3.1)	9992 (96.9)	.028
US\$20 000 to < US\$35 000	92 (19.4)	478 (80.6)		17 (1.2)	678 (98.8)	
US\$35 000 to < US\$50 000	108 (21.1)	464 (78.9)		21 (3.0)	692 (97.0)	
US\$50 000 to < US\$75 000	120 (19.2)	682 (80.8)		16 (2.3)	813 (97.7)	
US\$75 000 or More	288 (19.1)	1348 (80.9)		46 (3.7)	1523 (96.3)	
Employment						
Employed	486 (21.3)	2001 (78.7)	.043	78 (2.7)	2617 (97.3)	.390
Not employed	247 (16.3)	1508 (83.7)		58 (3.4)	2081 (96.6)	
Census region						
Northeast	106 (15.5)	597 (84.5)	.319	21 (2.5)	744 (97.5)	.882
Midwest	140 (20.8)	641 (79.2)		26 (3.43)	867 (96.7)	
South	304 (20.9)	1440 (79.1)		61 (2.7)	1929 (97.3)	
West	183 (19.6)	831 (80.4)		28 (3.3)	1157 (96.7)	
Health insurance						
Yes	656 (19.3)	3269 (80.7)	.649	109 (2.9)	4163 (97.2)	.575
No	77 (21.3)	240 (78.7)		27 (3.5)	535 (96.7)	
General health						
Excellent	100 (19.2)	450 (80.8)	.447	12 (1.8)	537 (98.2)	.690
Very good	286 (21.4)	1345 (78.6)		43 (3.3)	1663 (96.7)	
Good	237 (17.4)	1221 (82.6)		49 (2.9)	1746 (97.1)	
Fair	96 (21.0)	424 (79.0)		25 (3.2)	609 (96.8)	
Poor	14 (16.2)	69 (83.8)		7 (3.0)	143 (97.0)	
Smoking status						
Current	106 (20.8)	443 (79.2)	.205	27 (2.6)	666 (97.4)	.566
Former	149 (16.1)	969 (83.9)		23 (2.3)	1248 (97.7)	
Never	478 (20.6)	2097 (79.4)		86 (3.3)	2784 (96.7)	

(continued)

Table 1. (continued)

	Health Information Share, N = 4242, Weighted N=343 465 241 (2-year pooled sample)			Medical Information Exchange, N = 4834, Weighted N=354 419 489 (2-year pooled sample)		
	Yes	No		Yes	No	
Diagnosed with cancer						
Yes	90 (17.7)	496 (82.3)	.469	16 (3.9)	646 (96.1)	.583
No	643 (19.7)	3013 (80.3)		120 (2.9)	4052 (97.1)	
Family history of any cancer						
Yes	547 (22.1)	2454 (77.9)	<.001	93 (3.2)	3230 (96.8)	.672
No	147 (14.4)	854 (85.6)		35 (2.3)	1172 (97.7)	
Not sure	39 (12.4)	201 (87.6)		8 (3.1)	296 (96.9)	

exchange) were assessed using 2 HINTS survey questions. To assess *health information sharing*, respondents were asked, "In the last 12 months, have you shared health information on social networking sites, such as Facebook or Twitter?"; to assess *medical information exchange*, respondents were asked, "In the past 12 months, have you used social media (e.g., Facebook, Google+, CaringBridge, etc.) to exchange medical information with a health care professional?" Respondents answered either "yes" or "no" to these 2 questions.

Sociodemographic variables. Respondents' social demographics collected from multiple questions in HINTS include age, sex, race/ethnicity, education level, marital status, family income, employment status, and census region. The respondent's age was grouped into 3 categories: young adults, 18 to 49 years; middle-aged adults, 50 to 64 years; and older adults, 65 years or older. Sex and employment status were measured as a binary variable. Although detailed race/ethnicity information was collected in the HINTS, such as Asian Americans, Native Americans, Native Hawaiian, and Pacific Islanders, due to small sample size in some of these subgroups, we classified respondents into four race/ethnicity groups: non-Hispanic white, non-Hispanic black, Hispanic, and other. The marital status in the survey includes married, divorced, widowed, separated, never married, or living with a partner. We grouped respondents' marital status into 3 categories: single, married, and divorced/widowed/separated. The education level included less than high school, high school graduate, some college, and college or higher. The income variable has 5 levels: <US\$20 000, US\$20 000 to <US\$35 000, US\$35 000 to <US\$50 000, US\$50 000 to < US\$75 000, and US\$75 000 or more.

Health-related variables. Respondents' access to health care was assessed by the question asking whether respondents have any health insurance coverage. The respondents' health status was assessed by HINTS using a question with 5-point rating scale that ranged from "poor" to "excellent." Respondent was classified into current, former, and never smokers using 2 smoking-related questions "Have you smoked at least 100 cigarettes in your entire life?" and "How often do you now smoke cigarettes?" We used 2 cancer-related questions to assess

respondent's personal and family history of cancer: "Have you ever been diagnosed as having cancer?" and "Have any of your family members ever had cancer?"

Cancer-related psychological variables. We assessed respondents' knowledge and beliefs about cancer using 5 HINTS questions: (1) "How likely are you to get cancer in your lifetime?" (5-point rating scale ranged from "very unlikely" to "very likely"); (2) "How worried are you about getting cancer?" (5-point rating scale ranged from "not at all" to "extremely"); (3) "How much do you agree or disagree: It seems like everything causes cancer?"; (4) "How much do you agree or disagree: There's not much you can do to lower your chances of getting cancer?"; and (5) "How much do you agree or disagree: In adults, cancer is more common than heart disease?" (4-point rating scale for all ranged from "strongly agree" to "strongly disagree").

Statistical Analysis

We conducted bivariate analysis using the Pearson χ^2 test to assess the association of respondents' basic demographic characteristics as well as health status and social media use for sharing health information and exchanging medical information with a health-care professional. To examine the factors associated with sharing health information and exchanging medical information, we conducted multivariable logistic regression models. The χ^2 test was used to test the association between the use of social media and cancer beliefs and knowledge.

All statistical tests were 2-sided, and all analyses were performed using SAS version 9.4 software (SAS Institute, Cary, North Carolina). Sampling weights calculated from the HINTS complex sample design were used in the statistical analysis using SAS. We used the SURVEYMEANS procedure to derive nationally representative estimates on the bivariate analysis and to generate standard errors and SURVEYLOGISTIC procedure for the multivariable logistic model. Statistical significance was defined as $P < .05$. This study was deemed exempt from review by the Institutional Review Board at the University of Florida.

Results

Use of Social Media for Sharing the Health Information

Demographics and health characteristics. We compared the use of social media for sharing health information by respondents' demographic and health characteristics (Table 1). We observed that the use of social media for sharing health information had dropped significantly from the year 2013 (24.7%) to 2017 (15.7%; $P < .001$). Compared to the population aged 50 to 64 years old (11.6%) and the elderly population aged 65 years or older (5.5%), the younger population aged 49 or less has a significantly higher rate of social media use for sharing health information (26.4%; $P < .001$). The other factors associated with higher use of social media for sharing health information included female gender, a college education or higher, not being divorced/windowed/separated, being employed, or having a family history of any cancer.

Logistic regression model. In the multivariable analysis, a lower odd of using social media for sharing health information was observed in respondents who were surveyed in year 2017 (odds ratios [ORs], 0.65; 95% confidence intervals [CIs], 0.49-0.85, $P = .002$), aged 50 to 64 (OR, 0.32; 95% CI, 0.24-0.43, $P < .001$), aged 65 and older (OR, 0.15; 95% CI, 0.09-0.25, $P < .001$; Table 2). The respondents' characteristics associated with higher odds of using social media for sharing health information were female (OR, 2.22; 95% CI, 1.51-3.26, $P < .001$), diagnosed with cancer (OR, 1.53; 95% CI, 0.96-2.43, $P = .073$; reduced model [Supplemental Table 2]: OR, 1.56; 95% CI, 1.03-2.36, $P = .037$), or had family history of any cancer (OR, 1.56; 95% CI, 1.10-2.21, $P = .014$; Table 2). The results of logistic regression model with only statistically significant variables are shown in Supplementary Table 2.

Cancer beliefs and knowledge. We observed differences in beliefs and knowledge about cancer between respondents who used social media for sharing health information and those who did not (Table 3). For instance, respondents who used social media to share health information were more concerned about the chance of getting cancer in their lifetime ($P = .029$), concerned about everything that causes cancer ($P = .008$), and worried about getting cancer ($P = .004$). Also, a higher proportion of respondents who used social media to share health information felt that cancer prevention is possible compared to those who did not use social media ($P = .001$).

Use of Social Media to Exchange the Medical Information

Demographics and health characteristics. We examined the use of social media for exchanging medical information with a health-care professional by respondents' demographic and health characteristics (Table 1). We observed the use of social media for exchanging medical information had almost doubled from the year 2013 (2.0%) to 2014 (3.8%; $P = .025$). Compared to the population aged 50 to 64 years old (2.4%) and 65 years or

older (1.5%), the younger population aged 49 or less had a higher rate of social media use for exchanging medical information with a health care professional (3.5%; $P = .022$).

Logistic regression model. Table 2 summarizes the results from the multivariable logistic regression model that predicted the use of social media to exchange medical information with a health-care professional. Two variables, including year of survey and age group, were significantly associated with higher social media use for exchanging medical information. Respondents in the year 2014 had a higher odds of social media use for exchanging medical information compared to those in the year 2013 (OR, 1.88; 95% CI, 1.09-3.26, $P = .025$). A decreased odds of social media use for exchanging medical information was observed with increased age-group (50-64 years old: OR, 0.62; 95% CI, 0.32 -1.22, $P = .162$; 65 years or older: OR, 0.37; 95% CI, 0.13 -1.07, $P = .065$; reduced model [Supplemental Table 2]: OR, 0.43; 95% CI, 0.23-0.82, $P = .011$).

Cancer beliefs and knowledge. Respondents who used social media for exchanging medical information had higher cancer knowledge and more reasonable and optimistic views about cancer compared to respondents who did not use social media for this purpose. For instance, the respondents who used social media to exchange medical information were more likely to believe that cancer is preventable compared to individuals who do not use social media for this purpose ($P = .047$). These social media users were also more optimistic about the chance of getting cancer in their lifetime, were less worried about getting cancer, and were less likely to strongly agree with the statements that everything causes cancer or cancer is more common than heart disease. However, these 4 comparisons were not statistically significant (Table 3).

Discussion

Our findings from the NCI HINTS 2013, 2014, and 2017 data indicate that use of social media to share health information in social media platform has reduced significantly over time, while the use of social media to exchange medical information with a health-care professional has increased. In this study, we examined many factors associated with the use of social media for health communication, and neither disparities in minority nor low-income groups in use of social media in health communication were observed. In fact, we found that year and age are the 2 most significant factors associated with use of social media for health communication. Also, relative to respondents who did not use social media for health communication, the respondents who shared health information on social media platforms had more concerns about cancer. The respondents who used social media to exchange medical information with health-care professionals had more reasonable beliefs about cancer prevention and tended to be more accurate on cancer-related knowledge.

The findings in the opposite direction in temporal trend in the use of social media to share health information and trend to

Table 2. Predictors of Use of Social Media in Health Communication Using Logistic Regression.

Characteristics	Health Information Share			Medical Information Exchange			
	OR	95% CI	P Value	OR	95% CI	P Value	
Year							
2013	1.00			1.00			
2014	–	–	–	1.88	1.09	3.26	.025
2017	0.65	0.49	0.85	–	–	–	.002
Age-group							
18-49	1.00			1.00			
50-64	0.32	0.24	0.43	0.62	0.32	1.22	.162
65+	0.15	0.09	0.25	0.37	0.13	1.07	.065
Sex							
Male	1.00			1.00			
Female	2.22	1.51	3.26	1.16	0.65	2.09	.614
Race/ethnicity							
Non-Hispanic white	1.00			1.00			
Non-Hispanic black	0.82	0.52	1.31	1.53	0.68	3.43	.293
Hispanic	1.01	0.66	1.55	2.22	0.82	6.04	.116
Other	1.13	0.69	1.84	1.97	0.63	6.14	.235
Education							
Less than high school	1.00			1.00			
High school graduate	1.48	0.66	3.34	1.21	0.12	12.33	.868
Some college	2.11	0.89	4.98	2.11	0.21	20.94	.517
College or higher	1.46	0.59	3.58	1.35	0.14	13.01	.794
Marital status							
Single	1.00			1.00			
Divorced/widowed/separated	0.97	0.53	1.80	1.10	0.40	3.01	.856
Married	1.37	0.85	2.23	0.85	0.34	2.14	.730
Family income							
Less than US\$20 000	1.00			1.00			
US\$20 000 to < US\$35 000	1.01	0.59	1.73	0.43	0.15	1.26	.122
US\$35 000 to < US\$50 000	1.09	0.60	1.96	1.37	0.43	4.44	.589
US\$50 000 to < US\$75 000	0.99	0.54	1.80	1.12	0.33	3.82	.852
US\$75 000 or More	0.95	0.54	1.65	2.20	0.74	6.57	.154
Employment							
Not Employed	1.00			1.00			
Employed	1.16	0.79	1.70	0.54	0.26	1.11	.093
Census region							
Northeast	1.00			1.00			
Midwest	1.43	0.76	2.70	1.50	0.52	4.38	.448
South	1.47	0.90	2.39	1.01	0.39	2.58	.990
West	1.24	0.75	2.06	1.10	0.40	2.99	.857
Health insurance							
No	1.00			1.00			
Yes	1.07	0.58	1.99	0.66	0.27	1.62	.354
General health							
Poor	1.00			1.00			
Excellent	0.77	0.22	2.66	0.54	0.10	2.94	.466
Very Good	0.97	0.31	3.06	1.05	0.23	4.78	.950
Good	0.75	0.23	2.46	0.91	0.20	4.07	.898
Fair	1.13	0.35	3.62	0.94	0.20	4.48	.941
Smoking status							
Current	1.00			1.00			
Former	0.92	0.55	1.55	0.93	0.30	2.90	.892
Never	1.05	0.69	1.61	1.21	0.56	2.62	.615
Diagnosed with cancer							
No	1.00			1.00			
Yes	1.53	0.96	2.43	1.75	0.49	6.29	.384
Family history of any cancer							
No	1.00			1.00			
Yes	1.56	1.10	2.21	1.59	0.63	4.01	.319
Not sure	0.77	0.42	1.40	1.55	0.20	11.71	.667

Abbreviations: CI, confidence interval; OR, odds ratio.

exchange medical information with a health-care professional suggest heterogeneity in health communication. The overall rate of respondents in use of social media to share the health information in 2017, 16%, has been more than doubled compared with the rate of 6% reported in a research conducted by Pew Internet & American Life survey in 2009.¹⁹ However, this rate was reduced by 36% since the year 2013. A possible explanation for this large drop after 2013 could be the raised public concern about privacy because of a number of high-profile security breaches in a number of social media platforms. Maintaining privacy on social media can be very difficult for social media users who are not familiar with complicated privacy settings from these social media platforms. After more than 3 billion user accounts has been impacted in the 2013 Yahoo data breach, data security and privacy protection have become emerging issues.²⁰ To avoid oversharing and the risk of privacy breach, social media users may have limited the amount of health information shared on the social media platforms.

Compared to relatively less privacy education on the general social media users, health-care professionals' participation in social media-based communication has been more guided and regulated.²¹ This may explain why we observed an upward trend of use of social media in medical information exchange. To date, many health-care professional societies have issued guidelines to protect patient privacy in patient-physician communication through social media platform,²²⁻²⁵ and this privacy-aware communication will be critical for the success in the adoption of social media in health care. As we expected, the use of social media in medical information exchange is low. There are several reasons that may explain the current low use. First, health-care professionals may hesitate to use this new media platform to communicate with their patients due to the privacy and legal concerns. Second, insurance payers do not reimburse time devoted by health-care professionals to social media-based health communication with patients. As the number of providers sharing health information and answering health questions outside the patient-physician encounters continue to increase, we will see more issues emerging beyond privacy, such as liability and quality of care. However, with more guidelines available in guiding appropriate physician-patient communication using social media, health-care professionals will feel comfortable to integrate this new tool into clinical practice.

Although the number of social media users have increased remarkably over the past 10 years, most of this growth was in the younger population. As shown in our study, the younger population still has a much higher percentage of social media use in health communication than the elderly population. As reported in the most recent data, 88% of the population aged 18 to 29 years old are social media users, compared to 78% of those aged 30 to 49 years, 64% of those aged 50 to 64 years, and 37% of those aged 65 years or older.²⁶ Studies indicate that—other than technology difficulties—extraversion was the major characteristic predicting social media use in the elderly population.^{27,28} Echoed by our study, there was a very low

percentage of respondents aged 65 years who used social media to share or exchange health information. Findings from the multivariable logistic regression also suggested that respondent's age is a significant predictor of lower social media use for health communication. In the recent years, the improved access to Internet services and the relatively low cost of developing Internet-based health applications have led to increased interest in implementing social media-based health promotion and intervention programs. However, further research is needed to engage the elderly population in these health programs, especially for projects targeting age-related diseases such as various types of cancers.

Although racial and ethnic disparities in health-care access and utilization were well reported in the literature,²⁹⁻³² our study found no disparities in the use of social media for health communication, including sharing health information and exchanging medical information with health-care professionals. Studies published over the past 2 decades reported racial disparities in seeking health information from the Internet among young women aged 16 to 24 years³³ and in the overall population.³⁴ However, significant efforts have been made in the past 2 decades to reduce disparities in the use of the Internet in the United States. The Federal Communications Commission's (FCC) Universal Service program spend US\$1.7 billion to make telecommunication services, including high-speed Internet, accessible to the public at reasonable and affordable costs, especially for the population living in rural and insular areas and low-income population.³⁵ A number of initiatives from the FCC's low-income support program, the US Agriculture Department's Rural Utilities Service, and the US Commerce Department's National Telecommunications and Information Administration were started in 1999 to reduce the digital divides in the United States.³⁶ In a previous study using 2007 HINTS data, the absence of inequalities between non-white Americans and non-Hispanic white Americans in use of social media has been reported,^{37,38} echoing the significant improvement in reducing the access barriers in use of Internet services. Our study also demonstrated that these initiatives had improved this digital divide in social media use significantly.

More notably, the present study indicates respondents who used social media in health communication for exchanging medical information with a health-care professional may have better knowledge and rational beliefs about cancer prevention than individuals who do not use social media for this purpose. The accuracy of health information from these informal sources are always questionable. However, the newly emerged social media-based health information dissemination offered a valid venue to promote accurate health information and educational resources to the public. The social media's inexpensive and broad reach to the public offered a large potential for the health promotion and behavior change programs.³⁹ By following the health-care professional's account, major news channels, medial societies' accounts, and other health information disseminators, social media users receive most updated health information automatically. These social media users were also exposed to health information and educational resources

Table 3. Survey Respondents' View on Cancer.

Cancer belief and knowledge	Health Information Share				P Value	Medical Information Exchange				P Value
	Yes		No			Yes		No		
	N	Row.%	N	Row.%		N	Row,%	N	Row,%	
Likely to get cancer					.029					.472
Very unlikely	42	4.5	252	7.1		14	11.2	356	6.5	
Unlikely	90	8.9	414	12.3		24	18.9	576	11.1	
Neither unlikely nor likely	299	42.2	1479	42.8		53	43.4	1969	44.5	
Likely	196	31.1	962	29.1		31	18.8	1213	28.4	
Very likely	61	8.8	171	4.9		7	4.5	231	5.0	
Unknown	45	4.5	231	3.7		7	3.2	353	4.6	
Everything causes cancer					.008					.691
Strongly agree	161	22.3	618	19.5		21	13.9	780	18.9	
Somewhat agree	361	53.6	1613	47.8		63	53.1	2033	46.3	
Somewhat disagree	139	16.4	769	20.8		27	15.5	1051	20.4	
Strongly disagree	69	7.6	484	11.3		23	16.7	780	13.6	
Unknown	3	0.1	25	0.5		2	0.7	54	0.7	
Cancer prevention not possible					.001					.047
Strongly agree	34	3.4	201	6.0		11	3.1	295	6.4	
Somewhat agree	135	16.2	664	19.3		23	19.5	935	19.7	
Somewhat disagree	307	46.3	1381	39.8		52	40.2	1810	40.8	
Strongly disagree	254	34.0	1221	33.9		49	36.9	1599	32.4	
Unknown	3	0.1	42	0.9		1	0.3	59	0.8	
Cancer more common					.446					.639
Strongly agree	75	7.4	292	7.7		13	6.1	433	8.5	
Somewhat agree	266	39.4	1205	34.6		51	35.7	1534	33.0	
Somewhat disagree	263	33.3	1343	39.5		44	33.0	1774	38.7	
Strongly disagree	120	18.4	581	16.5		27	24.6	846	18.1	
Unknown	9	1.4	88	1.7		1	0.7	111	1.7	
Frequently Worried about Cancer					.004					.210
Not at all	105	13.2	687	19.6		23	19.2	1021	21.9	
Slightly	214	29.4	1111	31.2		40	26.5	1351	30.8	
Somewhat	217	30.5	930	27.2		43	40.6	1098	23.5	
Moderately	107	17.4	402	13.2		14	7.5	558	13.0	
Extremely	46	4.9	176	5.4		10	3.0	337	6.7	
Unknown	44	4.6	203	3.2		6	3.1	333	4.2	

through “share” or “retweet” from their social media network.⁴⁰ However, it is important to note that being engaged in social media does not mean that social media users always receive high-quality, evidence-based, validated health information. As shown in our study, the individuals who used social media for sharing health information did not have more knowledge or more reasonable beliefs than individuals who did not share health information in social media platforms. It is critical for individuals to become connected with the right health information sources, such as information shared by health-care professionals, to obtain accurate health information that facilitates their health decision-making processes.

Although this study reported the most up-to-date trends in the use of social media for health communication, it has some limitations. First, although respondents reported the use of social media to share health information and to exchange medical information, the purpose and content of the health information communicated were unknown. Second, the survey collected self-reported data. Therefore, the responses on the

use of social media depended on respondents' recall in the past 12 months, which is subject to recall bias as well as their willingness to share this information. Third, the questions in the HINTS survey about the use of social media for health communication were not included for every cycle of the survey, so only 2 years of data were available for the analyses. Fourth, the respondents' satisfaction with using social media in health communication was not collected. Future studies should be conducted to assess patient satisfaction with social media for health communication.

In summary, our findings suggest that use of social media for health information sharing has declined in the past few years, while the use of social media for engaging with health care professionals has increased. The fast growth of internet penetration in the United States and national initiatives in closing the digital divide will facilitate access to health information in social media platforms. The rapid expansion of social media use between patients and health-care professionals creates a unique opportunity for researchers to develop social media–

based health promotion programs and potentially reduce social inequalities in health. Further research is needed to identify strategies for engaging patients in social media-based health interventions, particularly older adults, and how to promote the dissemination of current, accurate, high-quality, and evidence-based medical knowledge.


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Supplemental Material

Supplemental material for this article is available online.

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