INNOVATIONS in pharmacy

Volume 8 | Number 2 Article 1

4-10-2017

# Relationship between Health Information Sharing Behavior Using Social Media and Breast Cancer Screening

Maithili Deshpande
*Southern Illinois University Edwardsville*, mdeshpa@siue.edu

Kevin A. Look
*University of Wisconsin - Madison*, kevin.look@wisc.edu

# Relationship between Health Information Sharing Behavior Using Social Media and Breast Cancer Screening

*Maithili Deshpande, PhD[1]; Kevin A. Look, PharmD, PhD[2]*
*[1]Southern Illinois University-Edwardsville School of Pharmacy; [2]University of Wisconsin-Madison School of Pharmacy*

**Abstract**

***Background:*** *Despite established screening guidelines, breast cancer screening rates are below targeted goals. Pharmacists and other health care providers can promote breast cancer screening using tools such as social media. However, little is known about the use of social media among the breast cancer screening eligible population.* ***Objective:*** *To describe the health information sharing behavior using social media of the breast cancer screening eligible population, and to identify if sharing health information on social media was associated with breast cancer screening.* ***Methods and materials:*** *Data from the 2013 Health Information National Trends Survey were analyzed using descriptive statistics and bivariate logistic regression to evaluate the association between sharing health information on social media and receipt of a mammogram.* ***Results:*** *Women sharing health information via social media were significantly younger than those who did not. A significantly higher percentage of Hispanics (17.8%) and other races (27.0%) chose to share health information on social media compared to African Americans (8.6%) and Whites (12.9%). Mammogram rates did not differ based on social media health information sharing habits.* ***Conclusion:*** *Race and age differences were noted in health information sharing behavior. No association was found between health information sharing behavior and breast cancer screening.*

**Keywords:** breast cancer screening; social media; health information sharing

## Introduction

Social media, a means of electronic communication where users can share information and ideas online, is increasingly being used for sharing health information.[1, 2] A Pew Research Center report found that 4 out of 10 people who commented on their health online have shared their personal health experiences online with others.[3] Social media can increase engagement and access to health information to broader and more diverse audiences, as 71% of adults over 18 years old who use the internet also use social media.[2, 4] Communicating health information on social media is a rapid, low-cost method that can easily offer a large amount of information to a large audience and can impact their health and health behaviors.[2, 5, 6]

Social media has also been promoted as a way for pharmacists to foster engagement and dialogue about medications and public health topics with their patient population.[6] Many pharmacy organizations use social media to reach out to their followers about their products, provide reminders about preventive services, and distribute health information.[7] Walgreens has almost 1 million followers on Twitter, while Duane Reade, a subsidiary of Walgreens Boots Alliance, has almost 1.2 million followers.

**Corresponding author:** Maithili Deshpande, PhD
Southern Illinois University-Edwardsville School of Pharmacy
200 University Park Dr., Campus Box 2000
Edwardsville, IL 62026
Phone: 217-545-4429; Fax: 217-545-0799
E-mail: mdeshpa@siue.edu

Social media has also been used by local health departments to engage the public in a dialogue on public health issues.[5, 8, 9] One such public health issue is breast cancer. It is the second leading cause of cancer mortality in women, with an estimated 230,815 new cases and 40,860 associated deaths in 2013.[10] Since breast cancer treatment can be expensive and not 100% effective, timely screening and prevention should be a focus for pharmacists and other healthcare professionals.[11] The United States Preventive Services Task Force (USPSTF) recommends that women 50-74 years old receive a mammogram every 2 years. However, only 69.1% of women over 50 had a mammogram within the past 2 years in 2013.[12] Rates are even lower among minority women and other ethnic minority groups.[13] These numbers remain well below the Healthy People 2020 goal of 81% for breast cancer screening, demonstrating a need for further improvement.[14]

Pharmacy organizations can play a critical role in facilitating breast cancer awareness and prevention activities, assessing breast cancer risk, providing education, and collaborating with medical teams to provide appropriate care.[15, 16] Pharmacy organizations can contribute to achieving this goal by communicating with women through public and/or community outreach activities, which can be accomplished by the use of tools such as social media.[11]

Previous research assessing the benefits and limitations of using social media for health education and communication in the general population have been conducted.[2, 5, 6, 8, 9, 17] However, the actual effect of social networking technologies on health promotion and patient outcomes is unclear. Our goal was to describe the social media habits of breast cancer screening

eligible patients to identify the utility of this approach to promoting preventive services. Further, we assessed whether the sharing of health information on social media was associated with breast cancer screening behavior.

## Methods

*Data Source*

Data for this study came from the 2013 Health Information National Trends Survey (HINTS). The HINTS is conducted by the National Cancer Institute and is a nationally representative survey of U.S. adults 18 and older containing information about the use of cancer-related information and social media communication trends.

*Study Sample*

Using the USPSTF guidelines, we limited our study sample to women 50-74 years old.[18] Women with a history of breast cancer or breast surgery were excluded. We excluded those who did not use the internet, as questions related to social media use were only asked to women who were internet users.

*Study Measures*

The dependent variable was receipt of breast cancer screening, which was operationalized as having received a mammogram within the last 2 years, as recommended by the USPSTF guidelines.[18] The primary independent variable of interest was sharing health information on social media, which was based on the question: "In the last 12 months, have you used the Internet to share health information on social networking sites, such as Facebook™ or Twitter™?"[19]

Other independent variables were included to describe the study population. Race was defined as non-Hispanic White, non-Hispanic African American, Hispanic, and other race. Marital status was categorized into married, divorced/widowed/separated, or single/never married. Education was classified as less than high school, completed high school, some college, or college graduate. Household income was categorized into three groups: $0-34,999 per year, $35,000-74,999 per year, and $75,000+ per year. Insurance status was categorized as insured or uninsured. Perceived general health was classified as excellent, very good, good, fair, or poor. Smoking status was categorized into former smoker, current smoker, or never smoked.

*Data Analysis*

Descriptive statistics were used to evaluate the health information sharing habits of the sample. T-tests and chi-squared tests were used to test for differences in health information sharing using social media and our independent variables. Bivariate logistic regression was used to assess the association between our independent variables and receipt of a mammogram. *A priori* statistical significance was determined at the $p<0.05$ level. Data analysis and statistical tests were completed using Stata 14.[20] HINTS replicate weights were used to account for the complex survey design and to produce nationally representative estimates.

## Results

A total of 731 women ages 50-74 years old were included in the study. Table 1 describes the breast cancer screening eligible population and their health information sharing habits using social media. The average age was 61 years old with a majority of women being White, married, college graduates, and in very good health. Seventy-eight percent of women had a mammogram within the last 2 years. Those who used social media to share health information were significantly younger than those who did not share health information on social media (58.8 years vs 61.9 years, $p<0.001$). The sharing of health information on social media also differed based on race. A significantly larger percentage of Hispanics (17.8%) and other races (27.0%) chose to share health information compared to Whites (12.9%) or African Americans (8.6%). Only 13% (95/731) of breast cancer screening eligible women used social media to share health information. There were no differences in health information sharing rates based on marital status, insurance, education, income, perceived general health, and smoking status of the participants.

Table 2 shows bivariate relationships between breast cancer screening behavior and the independent variables. Women who were divorced/widowed/separated were 49% less likely to get a mammogram compared to those who were married (OR: 0.51, CI: 0.28 - 0.91). Additionally, women who had some college education were 51% less likely to get a mammogram compared to those who were college graduates (OR: 0.49, CI: 0.26 - 0.92). Women with a household income of $0-34,999 per year and those with a household income of $35,000-$74,999 per year were significantly less likely to have had a mammogram than women with a household income of $75,000+ per year (OR: 0.15, CI: 0.06 - 0.05 and OR: 0.26, CI: 0.12 - 0.53, respectively). Lastly, current smokers were 72% less likely to obtain a mammogram than women who had never smoked (OR: 0.28, CI: 0.12 - 0.67). There was no association between breast cancer screening behavior and health information sharing status (OR: 0.79, CI: 0.35 - 1.80).

## Discussion

Pharmacists are increasingly taking on greater involvement in public health initiatives, particularly in the community pharmacy setting. Social media has been promoted as a way for pharmacists to foster engagement and dialogue about medications and public health topics, such as breast cancer, with their patient populations.[6] However, we found that a minority (13%) of breast cancer screening eligible women used social media such as Facebook™ or Twitter™ to share health information. It is likely that privacy and confidentiality concerns about sharing personal health information on social media may have contributed to this result.[6] Another study examining the sharing of health information online found that only 23% of

respondents reported using Twitter™ to share health information.[21] This is an important limitation of using social media to communicate preventive health information to patients.

Content analyses of breast cancer specific Facebook groups show that a majority of groups are created for fundraising or raising awareness about the disease.[22] Only 7% of these groups were devoted to support groups for individuals who have survived, are battling or have died from breast cancer.[22] Another study found that tweeting about breast cancer did not promote any specific preventive behavior and is mostly used as a one-way communication tool.[9] However, anonymous online forums, such as message boards and support groups, provide information, emotional support and an avenue for self-expression.[23] Future research could focus on determining why individuals choose to share health information on social media and what they hope to obtain from it, as well as why others choose not to do so. A better understanding of how and why people share health information from sources such as pharmacies or health departments is necessary before widespread use of this approach can be recommended.

We identified racial differences in the sharing of health information using social media, where a higher percentage of Hispanics and other races chose to share health information on social media compared to African Americans and Whites. This finding corresponds with research showing that a higher percentage of Hispanics use Facebook™ and Twitter™ compared to Whites.[4] Hispanics come from a collectivistic culture and they tend to prefer group activities, shared responsibility and collective accountability.[24] Therefore, it is possible that the tendency for Hispanic populations to look to others to help guide decisions may make it more likely for them to consider reaching out through social media. Thus, pharmacists trained in providing culturally competent care may be able to advocate breast cancer screening to this population using social media.[25]

Women who used social media to share health information were also significantly younger than those who did not. A 2014 report found that 65% of adults age 50-64 years used social media, whereas only 49% of adults age 65 and older used social media.[26] This indicates that social media may be a better tool for health promotion in younger women, although it may still reach a subpopulation of older women. Our findings were also consistent with previous studies, which found lower rates of cancer screening among women who have low income, currently smoke, and are uninsured.[27]

Even though no association was seen between social media use and mammogram rates, social media holds potential for health support, intervention and promotion campaigns. For example, Attai et al. found that participation in a breast cancer Twitter™ support group increased patient knowledge regarding the disease condition and management and significantly decreased anxiety levels.[28] The use of social media for professional purposes is underutilized and holds promise for the field of pharmacy.[6, 29] Further exploration is needed to identify the potential of how social media use by pharmacists and pharmacy organizations can have a meaningful impact on public health initiatives.

**Limitations**

This is a cross-sectional study and causal relationships between social media and breast cancer screening cannot be established. The HINTS provides information about who did and did not share health information on social media; however, we do not know the reasons why women chose to share health information. This makes it difficult to assess the feasibility of using social media as a tool for promoting mammograms. Only a small proportion of women in our sample shared health information on social media, limiting our ability to detect a significant relationship between breast cancer screening and health information sharing behavior. Lastly, the data do not specify whether the shared health information was "specific" or "general" in nature. It is likely that a tweet from a relative about breast cancer diagnosis (specific) may have a larger impact than a tweet from CDC about breast cancer awareness (general).

**Conclusion**

Women who used social media to share health information were significantly younger and varied by race. However, no association was evident between health information sharing behavior and breast cancer screening. Future research is needed to understand why people share health information online and what they hope to obtain from it.

**Funding source: None**
**Conflict(s) of Interest: None**

**References**

1. "Social Media." *Merriam-Webster.com*. 2017. Available at: https://www.merriam-webster.com/dictionary/social%20media
2. Gill HK, Gill N, Young SD. Online Technologies for Health Information and Education: A literature review. *J Consum Health Internet.* 2013;17:139-150.
3. Fox S. The social life of health information: Pew Internet & American Life Project; 2014. Available at: http://www.pewresearch.org/fact-tank/2014/01/15/the-social-life-of-health-information/
4. Duggan M, Ellison N, Lampe C, Lenhart A, Madden M. Social Media Update: Pew Internet & American Life Project; 2014. Available at: http://www.pewinternet.org/2015/01/09/social-media-update-2014/

5. Balatsoukas P, Kennedy CM, Buchan I, Powell J, Ainsworth J. The Role of Social Network Technologies in Online Health Promotion: A Narrative Review of Theoretical and Empirical Factors Influencing Intervention Effectiveness. *J Med Internet Res.* 2015;17:e141.
6. Cain J, Romanelli F, Fox B. Pharmacy, social media, and health: Opportunity for impact. *J Am Pharm Assoc (2003).* 2010;50:745-751.
7. O'Hara B, Fox BI, Donahue B. Social media in pharmacy: heeding its call, leveraging its power. *J Am Pharm Assoc (2003).* 2013;53:561-564.
8. Neiger BL, Thackeray R, Burton SH, Thackeray CR, Reese JH. Use of twitter among local health departments: an analysis of information sharing, engagement, and action. *J Med Internet Res.* 2013;15:e177.
9. Thackeray R, Burton SH, Giraud-Carrier C, Rollins S, Draper CR. Using Twitter for breast cancer prevention: an analysis of breast cancer awareness month. *BMC Cancer.* 2013;13:508.
10. U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2013 Incidence and Mortality Web-based Report.* Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2016. Available at: http://www.cdc.gov/uscs.
11. Nguyen N. Contribution to breast cancer prevention for women: A challenge for pharmacists. *U.S. Pharmacist.* 2014;39:35-39.
12. Health, United States, 2014: With Special Feature on Adults Aged 55-64. Hyattsville, MD: National Center for Health Statistics; 2015.
13. Smith-Bindman, R, Miglioretti, DL, Lurie, N, et al. Does utilization of screening mammography explain racial and ethnic differences in breast cancer?. Ann Intern Med 2006; 144:541.
14. Healthy People 2020. Washington,DC: U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Available at: https://www.healthypeople.gov/2020/topics-objectives/topic/cancer/objectives
15. Ciardulli LM, Goode JV. Using health observances to promote wellness in community pharmacies. *J Am Pharm Assoc (2003).* 2003;43:61-68.
16. Giles JT, Kennedy DT, Dunn EC, Wallace WL, Meadows SL, Cafiero AC. Results of a community pharmacy-based breast cancer risk-assessment and education program. *Pharmacotherapy.* 2001;21:243-253.
17. Moorhead SA, Hazlett DE, Harrison L, Carroll JK, Irwin A, Hoving C. A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication. *J Med Internet Res.* 2013;15:e85.
18. Final Recommendation Statement: Breast Cancer: Screening. U.S. Preventive Services Task Force. 2016. Available at: https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/breast-cancer-screening1
19. Health Information National Trends Survey 4: Cycle 3 Methodology Report. 2014. Abailable at: https://hints.cancer.gov/docs/Instruments/HINTS_4_Cycle_3_Methods_Report_FINAL_508c_03_21_2014.pdf
20. StataCorp. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP2014.
21. Choudhury MD, Morris MR, White RW. Seeking and sharing Health Information Online: Comparing Search Engines and Social Media. *ACM Conference on Human Factors in Computing Systems*. Toronto, Canada2014.
22. Bender JL, Jimenez-Marroquin M-C, Jadad AR. Seeking Support on Facebook: A Content Analysis of Breast Cancer Groups. Houston T, ed. Journal of Medical Internet Research. 2011;13(1):e16. doi:10.2196/jmir.1560.
23. Koskan A, Klasko L, Davis SN, et al. Use and Taxonomy of Social Media in Cancer-Related Research: A Systematic Review. American journal of public health. 2014;104(7):e20-e37. doi:10.2105/AJPH.2014.301980.
24. Korzenny F, Vann L. Tapping into their connections: The multicultural world of social media marketing.: Quirk's Marketing Research Review; 2009.
25. O'Connell MB, Rodriguez de Bittner M, Poirier T, et al. Cultural competency in health care and its implications for pharmacy part 3A: emphasis on pharmacy education, curriculums, and future directions. *Pharmacotherapy.* 2013;33:e347-367.
26. Social media use by age group over time: Pew Internet and American Life Project; 2014. Available at: http://www.pewinternet.org/data-trend/social-media/social-media-use-by-age-group/
27. Komenaka IK, Nodora JN, Hsu CH, et al. Association of health literacy with adherence to screening mammography guidelines. *Obstet Gynecol.* 2015;125:852-859.
28. Attai DJ, Cowher MS, Al-Hamadani M, Schoger JM, Staley AC, Landercasper J. Twitter Social Media is an Effective Tool for Breast Cancer Patient Education and Support: Patient-Reported Outcomes by Survey. *J Med Internet Res.* 2015;17:e188.
29. Alkhateeb FM, Clauson KA, Latif DA. Pharmacist use of social media. *Int J Pharm Pract.* 2011;19:140-142.

**Table 1: Demographic characteristics: Sharing health information on social media**

| Characteristic | Overall Sample | Shared Health Information on Social Media | |
|---|---|---|---|
| | | YES | NO |
| | Unweighted n= 731<br>Weighted<br>N= 33,634,797<br>N (%) or mean (S.D.) | Unweighted n= 95<br>Weighted<br>N = 5,341,048<br>N (%) or mean (S.D.) | Unweighted n=628<br>Weighted<br>N = 27,787,864<br>N (%) or mean (S.D.) |
| **Age*** ** | 61.1 (8.1) | 58.8 (6.3) | 61.9 (8.4) |
| **Race*** | | | |
| Hispanic | 73 (6.5) | 13 (17.8) | 60 (82.2) |
| White | 431 (78.1) | 55 (12.9) | 372 (87.1) |
| African American | 108 (9.5) | 9 (8.6) | 96 (91.4) |
| Other | 37 (5.9) | 10 (27.0) | 27 (72.9) |
| **Marital Status** | | | |
| Married | 354 (68.3) | 51 (14.5) | 302 (85.6) |
| Divorced/Widowed/ Separated | 298 (24.4) | 36 (12.4) | 255 (87.6) |
| Single | 75 (7.3) | 7 (9.3) | 68 (90.7) |
| **Insurance** | | | |
| Insured | 679 (92) | 85 (12.7) | 587 (87.4) |
| Uninsured | 45 (8) | 10 (22.7) | 34 (77.3) |
| **Education** | | | |
| Less than High School | 24 (3.6) | 3 (12.5) | 21 (87.5) |
| Completed High School | 132 (21.6) | 13 (9.9) | 118 (90.1) |
| Some College | 247 (35.7) | 29 (12) | 213 (88) |
| College Graduate | 326 (39.1) | 50 (15.4) | 274 (84.6) |
| **Income** | | | |
| $0-34,999 | 196 (22.6) | 19 (10) | 172 (90) |
| $35,000-74,999 | 238 (35.7) | 42 (17.8) | 194 (82.2) |
| $75,000+ | 205 (41.7) | 30 (14.6) | 175 (85.4) |
| **Smoking Status** | | | |
| Current | 75 (10.7) | 15 (20.3) | 59 (79.7) |
| Former | 233 (31.3) | 33 (14.3) | 197 (85.7) |
| Never | 415 (58) | 47 (11.4) | 365 (88.6) |
| **General Health** | | | |
| Excellent | 87 (12.2) | 10 (11.5) | 77 (88.5) |
| Very Good | 269 (39.8) | 35 (13.2) | 230 (86.8) |
| Good | 264 (38.7) | 33 (12.7) | 227 (87.3) |
| Fair | 75 (8.4) | 11 (14.7) | 64 (85.3) |
| Poor | 12 (0.97) | 0 (0) | 12 (100) |
| **Mammogram** | | | |
| Yes | 572 (78) | 72 (12.7) | 495 (87.3) |
| No | 148 (22) | 21 (14.4) | 125 (85.6) |

t-tests and chi-square tests assess the difference between sharing health information on social media and independent variables
*p<0.05, **p<0.01, ***p<0.001

**Table 2: Bivariate relationships: Associations with obtaining a mammogram**

| Characteristic | Unadjusted Odds Ratio (95% CI) |
|---|---|
| **Age** | 0.99 (0.96 to 1.03) |
| **Race** | |
| Hispanic | 0.56 (0.21 to 1.52) |
| African American | 1.69 (0.68 to 4.14) |
| Other | 1.89 (0.28 to 12.65) |
| White | Reference |
| **Marital Status** | |
| Divorced/Widowed/Separated | 0.51* (0.28 to 0.91) |
| Single | 1.09 (0.43 to 2.80) |
| Married | Reference |
| **Insurance** | |
| Insured | 13.06*** (4.52 to 37.69) |
| Uninsured | Reference |
| **Education** | |
| Less than High School | 1.24 (0.33 to 4.67) |
| Completed High School | 1.07 (0.42 to 2.70) |
| Some College | 0.49* (0.26 to 0.92) |
| College Graduate | Reference |
| **Income** | |
| $0-34,999 | 0.15*** (0.06 to 0.05) |
| $35,000-74,999 | 0.26*** (0.12 to 0.53) |
| $75,000+ | Reference |
| **Smoking Status** | |
| Current | 0.28** (0.12 to 0.67) |
| Former | 1.18 (0.70 to 2.00) |
| Never | Reference |
| **General Health** | 0.72 (0.50 to 1.04) |
| **Shared health information on social media** | |
| Yes | 0.79 (0.35 to 1.80) |
| No | Reference |

*p<0.05, **p<0.01, ***p<0.001