

Online Health Information Seeking Behaviors among African Americans

Delores C.S. James¹, PhD, RD, LD/N & Cedric Harville², II, MPH

Abstract

Many individuals embrace the practice of self-care through online health information-seeking behaviors (HISB). However, these practices have not been explored among African Americans (AA). This study examined sources of health information and online HISB among AA. A convenience sample of 903 AA completed a self-administered survey. The most popular sources of information were physicians and the internet. Women were more likely to obtain information from physicians and nurses ($p < .0001$), while men were more likely to obtain information from TV and newspapers ($p < .001$). Most online searches were for general health/wellness and nutrition/dieting. Women were more likely than men to have searched for information on nutrition/dieting, medication, diabetes, asthma, mental health, and children's health ($p < .05$ for all). The study also found significant relationships between the diagnosis of various health conditions and HISB. Opportunities exist to create credible online health information that is culturally and gender specific.

Keywords: Health information-seeking behavior, mHealth, sources of health information, African Americans

Introduction

More Americans are becoming empowered and motivated to be active participants in their health and healthcare decision making (Bhandari, Shi, & Jung, 2014; Fox & Duggan, 2013). Additionally, many are embracing the practice of “digital” self-care in its many dimensions (Schull, 2016). One important component of self-care is finding health information to preserve, protect, and improve one's health and well-being (Sarasohn-Kahn, 2013). Having access to and understanding of relevant health information have the potential to improve health outcomes, improve overall quality of life, reduce health disparities and inequities, and improve the overall health of the nation (Department of Health and Human Services [DHHS], 2009). Finding health information may be as simple as asking a relative or friend for advice about a health condition to going online and reading the latest information on treating a disease (Jacobs, Amuta, & Jeon, 2017).

Health information-seeking behaviors (HISB) can be defined as the ways in which people intentionally seek information about their health, health risks, conditions/diseases, and treatment options (Lambert & Loiselle, 2007; Mukherjee & Bawden, 2012; Mills & Todorova, 2016). As a construct, HISB goes beyond casual exposure to health information from mass media, social media, or friends and family (Atkin, 1993; Griffin, Dunwoody, & Neuwirth, 1999). Historically, research on (HISB) has focused primarily on how individuals deal with stressful challenges such as chronic disease management and recent diagnosis of an illness to find health information (Jacobs, Amuta, & Jeon, 2017). However, the research has broadened to look at individuals who are motivated to participate in preventive health care and a healthy lifestyle (Ruppel & Rains, 2012; Weaver, Mays, Weaver, Hopkins, Eroglu, & Bernhardt, 2010). By the end of 2018, there were approximately 4.4 billion active internet users globally and 275 million in the United States (Statista, 2019a; Statista, 2019b). One important way in which the internet is interwoven with daily life is the fingertip-availability to an ever-increasing variety of health information through channels such as government agencies, blogs, disease-specific web portals, and support communities (Tonsaker, Bartlett, & Trpkov, 2014).

¹ Associate Professor, Department of Health Education and Behavior, P.O. Box 118210, Room 5 Florida Gym, University of Florida, Gainesville, FL 32611-8210, United States. E-mail: djames@hhp.ufl.edu

² Clinical Research Associate, University of South Florida, 12901 Bruce B Downs Blvd, MDC 22, Tampa, FL 33612, USA. E-mail: charvill@health.usf.edu

This is also being driven by current and emerging technologies, the speed of the internet, the ubiquitous ownership of smartphones and other mobile devices, and the ability of different types of users to generate and share content (Smith, 2017). Thus, the internet will continue to revolutionize the way information is accessed and shared.

Approximately 80% of American adult internet users report that they frequently participate in online HHSB, and more than half conduct health searches for a friend or family member (Fox & Duggan, 2013). The majority of those who participate in online HHSB tend to be affluent, college-educated white females (Pew, 2018a). Online HHSB are often used to learn more about specific health issues or concerns and enhance self-management and coping skills (Jacobs, Amuta, & Jeon, 2017; Weaver, et al., 2010). Additionally, they can prepare patients to have more informed discussions with their healthcare providers or motivate them to seek second opinions (Ruppel & Rains, 2012).

Despite the apparent benefits of online HHSB, certain populations like African Americans (AA) are less likely to participate in and benefit from these activities (Patel, Barker, & Siminerio, 2015; Fox & Duggan, 2013; Zichuhr & Smith, 2012). The disparities in online HHSB are occurring at a time when the federal government is pushing health professionals and organizations to put more information online (Bjarnadottir, Millery, Fleck, & Bakken, 2016). AA experience high prevalence of health disparities for most chronic and infectious diseases, poor health outcomes, low access to quality health care, and lower levels of overall quality of life than the general population (DHHS, 2009). However, they have a high ownership of smartphones, which is comparable to the general population (Pew, 2018a). But, this high ownership of smartphones is coupled with the fact that AA are more likely than whites to be smartphone dependent (Smith, 2017; Pew, 2018a). Another interesting paradox is that although there is a plethora of online health information, the internet is not free, and smartphone dependent consumers must make wise use of their mobile data plan. Hence, the digital divide continues to persist and contribute to the disparities in online HHSB (Bjarnadottir, Millery, Fleck, & Bakken, 2016).

There is a paucity of information on the sources of health information and the online HHSB among AA. Understanding this information has the potential to help researchers, practitioners, and public health professionals to create and disseminate more culturally relevant and culturally specific effective messages and programs to assist the public with adopting healthier lifestyles and patients with learning better self-management of diseases. This study aims to fill this knowledge gap and to expand the understanding of linkages between these concepts and reported diagnosis of certain health conditions. Specifically, this cross-sectional study examined technology use, medical diagnosis, sources of health information, and online HHSB among African Americans. While age, education, and literacy status affect HHSB, few studies have examined the influence of gender. Thus, this study also explored how these variables may differ between men and women.

Methods

Recruitment and Participants

A cross-sectional survey was completed by 903 AA (n=587 women, n=316 men) over a nine-month period in 2014 and 2015. The convenience sample was recruited primarily at community events, churches, barbershops, and hair salons. Eligibility criteria were: (1) self-identified as AA or Black, (2) 18 years and older, and (3) did not identify any cognitive or health issues that prevented them from completing the survey. The survey took approximately 15 minutes to be completed and each participant received a \$5 grocery gift card. The study received approval from the Institutional Review Board at the researcher's institution.

Measures

The questionnaire was developed based on a review of the literature on health information-seeking behavior, consumer technology use, social media usage, mHealth, AA participation in research, and other instruments previously used by the research team. Question types included "yes/no," "write in the space provided," "choose all that apply," and "rate on a scale."

The first section of the instrument addressed socio-demographic information (sex, marital status, education, homeownership, etc.). The second section addressed use of technology and device ownership. The third section addressed health status. The fourth section addressed sources of health information, online searches for specific health conditions, health apps, and willingness to use specific tools in mHealth education and research programs. Body mass index (BMI) was calculated using self-reported height and weight [BMI=weight (kg)/height (m)²] (WHO, 2006).

Statistical Analysis

Data were analyzed using the IBM SPSS for Windows (version 24.0 Armonk, NY). Frequencies and corresponding percentages were calculated for sociodemographic characteristics. Participants were compared based on sex. Data analysis included chi-square (X^2), and one-way analysis of variance. Statistical significance was established at $p < .05$ for all tests.

Results

The sample consisted of 596 women (66.0%) and 307 men (34.0%). The mean age was 37.28 ± 14.77 (women= 37.35 ± 14.73 , men= 37.08 ± 14.85). Most participants had at least a high school education, were single, non-homeowners, and currently employed. See Table 1 for specific demographic information by sex.

Table 1. Demographics (n=903)

Characteristics	Male		Female	
	n	(%)	n	(%)
Marital status				
Married	111	(35.8)	180	(30.8)
Single	199	(64.2)	405	(69.2)
Employment status				
Employed	191	(61.4)	367	(62.6)
Unemployed	120	(38.6)	219	(37.4)
Education level				
Did not finish high school	27	(8.8)	55	(9.4)
High school graduate	104	(33.8)	125	(21.3)
Some college	104	(33.8)	228	(38.8)
College graduate	39	(12.7)	91	(15.5)
Graduate/professional	34	(11.0)	88	(15.0)
Military				
Yes	43	(13.9)	21	(3.6)
No	266	(86.1)	560	(96.4)
Homeowner				
Yes	90	(29.0)	171	(29.1)
No	220	(71.0)	417	(70.9)

Device Ownership and Technology Use and Access

Participants owned a variety of electronic devices including smartphones (women=72.8%, men=65.0%), laptops (women=69.3%, men=65.0%), basic cellphone (women=39.1%, men=41.5%), traditional computers (women=38.9%, men=38.6%), and tablet computers (women=39.0%, men=28.6%). Women were significantly more likely to own smartphones ($X^2=6.04$, OR=1.45, 95% CI=1.07-1.94, $p < .01$) and tablet computers ($X^2=9.38$, OR=1.59, 95% CI, 1.18-2.13, $p < .001$). Internet was accessed from smartphones (women=73.51%, men=68.8%) as well from home (women=71.8%, men=68.8%), work (women=59.4%, men=46.3%), restaurants/coffee shops (women=27.8%, men=21.2%), and public libraries (women=37.9%, men=34.4%). Women were significantly more likely to use the internet from work ($X^2=14.15$, OR=1.70, 95% CI=1.29-2.24, $p < .001$) and from restaurants/coffee shops ($X^2=4.69$, OR=1.43, 95% CI=1.03-1.98, $p=.03$). In addition to using smartphones to access the internet, 41% of participants reported downloading a health/fitness app to their smartphones in the past 30 days (women=45.0%, men=33.2%), with women significantly more likely to have done so ($X^2=11.51$, OR=1.64, 95% CI, 1.23-2.16, $p < .001$).

Perceived Health Status

Overall health status was rated on a scale from one to five, with one being “poor” and five being “excellent.” Health was rated as “excellent” (women=13.27%, men=17.21%), “very good” (women=33.3%, men=33.4%), “good” (women=35.9%, men=33.4%), “fair” (women =15.1%, men=14.6%), and “poor” (women=2.4%, men=1.3%). There were no significant sex differences in health rating.

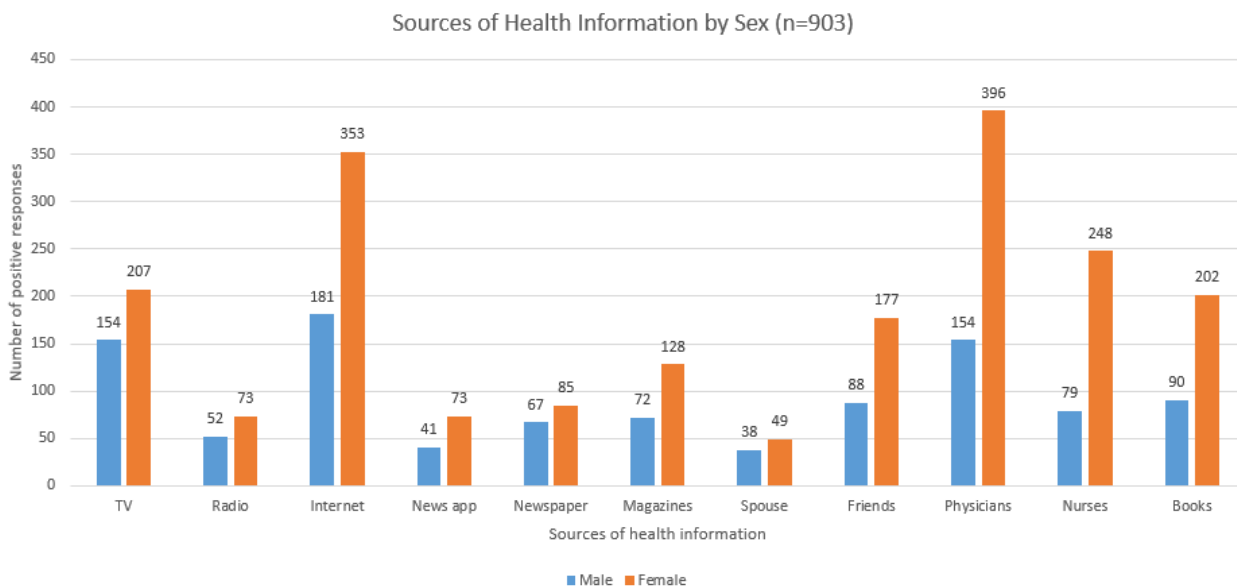
The mean BMI varied significantly by sex ($F_{1,837}=7.93, p<.01$), with women having significantly higher BMI than men (29.88 ± 8.05 vs. 28.33 ± 8.66). Additionally, based on BMI classification, women were more likely to be classified as obese (women=41.8%, men=33.1%, $X^2=9.10, OR=1.42, 95\% CI, 1.00-2.01, p=.05$). Most reported having a physical examination by a physician within the past 12 months, with women significantly more likely to have done so (80.3% vs. 69.1%, $X^2=7.56, OR=1.85, 95\% CI, 1.32-2.51, p<.001$).

Participants reported that a physician had diagnosed them with: obesity (women=18.7%, men=10.93%), diabetes (women=14.1%, men=12.5%), hypertension (women=28.2%, men=26.7%), heart disease (women=3.4%, men=3.22%), high cholesterol (women=14.1%, men=17.4%), cancer (women=3.1%, men=4.8%), asthma (women=15.1%, men=8.4%), and depression/anxiety (women=16.3%, men=9.0%). Women were significantly more likely than men to have been diagnosed with obesity ($X^2=9.10, OR=1.87, 95\% CI, 1.23-2.82, p=.002$), asthma ($X^2=8.32, OR=1.95, 95\% CI=1.23-3.09, p=.003$), and depression ($X^2=9.12, OR=1.97, 95\% CI=1.26-3.07, p<.01$).

Sources of Health Information

Participants were asked to “choose all that apply” from 11 common sources of health information. The two most popular sources of health information were physicians (women=67.2%, men=49.5%) and the internet (women=60.1%, men=58.2%). Women were significantly more likely than men to obtain health information from physicians and nurses ($p<.0001$ for both), while men were significantly more likely than women to get their health information from TV and newspaper ($p<.001$ for both). See Figure 1.

Figure 1 Sources of Health Information by Sex



Sources of health information was associated with reported diagnosis of certain health conditions. Notably, participants who reported physicians as a source of information were more likely to report that they had been diagnosed with obesity, diabetes, hypertension, and depression/anxiety ($p<.01$ for all). Participants who reported nurses as a source of information were more likely to report that they had been diagnosed with obesity, asthma, and depression/anxiety ($p<.05$ for all).

Additionally, those who reported the internet as a source of information were more likely to report that they had been diagnosed with diabetes, hypertension, heart disease, and elevated cholesterol ($p<.01$ for all). Refer to Table 2 for significant results on the sources of health information with the correspondent reported diagnosis.

Table 2. Sources of Health Information by Diagnosis (n=903)

Variables	Yes		No		X ²	OR	95% CI	<i>p</i>
	n	(%)	n	(%)				
Physicians								
Obesity	101	(18.3)	450	(81.7)	6.17	1.61	1.10-2.37	.01*
Diabetes	87	(15.8)	464	(84.2)	6.51	1.70	1.12-2.58	.01*
Hypertension	175	(31.8)	376	(68.2)	12.70	1.75	1.28-2.39	<.0001*
Cardiovascular Disease	17	(3.1)	534	(96.9)	.24	.83	.40-1.73	.62
Elevated cholesterol	93	(16.9)	458	(83.1)	2.84	1.39	.94-2.03	.09
Stroke	15	(2.7)	536	(97.3)	.66	.73	.34-1.55	.42
Cancer	18	(3.3)	533	(96.7)	.18	.88	.43-1.82	.73
Asthma	75	(13.6)	476	(86.4)	.75	1.20	.80-1.79	.39
Depression/anxiety	88	(16.0)	463	(84.0)	6.19	1.67	1.10-2.52	.01*
Nurses								
Obesity	65	(19.9)	262	(80.1)	5.77	1.56	1.09-2.24	.02*
Diabetes	50	(15.3)	277	(84.7)	1.40	1.26	.86-1.87	.24
Hypertension	83	(25.4)	244	(74.6)	1.24	.84	.62-1.14	.26
Cardiovascular Disease	8	(2.5)	319	(97.5)	1.28	.63	.28-1.44	.26
Elevated cholesterol	52	(15.9)	275	(84.1)	.15	1.08	.74-1.57	.70
Stroke	10	(3.1)	317	(96.9)	.00	.98	.45-2.14	.96
Cancer	11	(3.4)	316	(96.6)	.00	.97	.46-2.05	.93
Asthma	52	(15.9)	275	(84.1)	4.18	1.51	1.02-2.24	.04*
Depression/anxiety	63	(19.3)	264	(80.7)	12.80	2.01	1.37-2.95	<.0001*
Internet								
Obesity	76	(14.2)	458	(85.8)	2.84	.73	.51-1.05	.09
Diabetes	58	(10.9)	476	(89.1)	7.72	.58	.40-.85	<.01*
Hypertension	128	(24.0)	406	(76.0)	8.40	.65	.48-.87	<.01*
Cardiovascular Disease	11	(2.1)	523	(97.9)	6.40	.39	.18-.82	.01*
Elevated cholesterol	70	(13.1)	464	(86.9)	4.71	.67	.46-.96	.03*
Stroke	12	(2.3)	522	(97.8)	3.10	.51	.24-1.09	.08
Cancer	14	(2.6)	520	(97.4)	2.54	.56	.27-1.15	.11
Asthma	72	(13.5)	462	(86.5)	.48	1.15	.77-1.72	.49
Depression/anxiety	83	(15.5)	451	(84.5)	.48	3.70	.99-2.20	.055
TV								
Obesity	56	(15.4)	307	(84.6)	.12	.94	.65-1.35	.27
Diabetes	53	(14.6)	310	(85.4)	.61	1.17	.79-1.72	.43
Hypertension	103	(28.4)	260	(71.6)	.19	1.07	.79-1.44	.66
Cardiovascular Disease	13	(3.6)	350	(96.4)	.13	1.14	.55-2.38	.72
Elevated cholesterol	68	(18.7)	295	(81.3)	5.50	1.55	1.08-2.23	.02
Stroke	18	(5.0)	345	(95.0)	6.81	2.77	1.26-6.06	<.01*
Cancer	13	(3.6)	350	(96.4)	.04	1.08	.52-2.23	.84
Asthma	47	(13.0)	316	(87.0)	.01	1.02	.68-1.51	.94
Depression/anxiety	46	(12.7)	317	(87.3)	.58	.86	.58-1.27	.45
Radio								
Obesity	21	(16.7)	105	(83.3)	.06	1.06	.64-1.76	.81
Diabetes	23	(18.2)	103	(81.8)	2.62	1.53	.93-2.52	.11
Hypertension	33	(26.2)	93	(73.8)	.14	.92	.60-1.41	.71
Cardiovascular Disease	6	(4.8)	120	(95.2)	.85	1.57	.63-3.92	.36
Elevated cholesterol	18	(14.3)	108	(85.7)	.11	.91	.53-1.56	.74
Stroke	8	(6.4)	118	(93.6)	4.18	2.57	1.10-5.96	.04*
Cancer	5	(4.0)	121	(96.0)	.12	1.19	.45-3.17	.73
Asthma	18	(14.3)	108	(85.7)	.26	1.15	.67-1.99	.61
Depression/anxiety	16	(12.7)	110	(87.3)	.13	.90	.51-1.58	.71

Newspaper						
Obesity	14 (9.2)	139 (90.8)	7.12	.48	.27-.86	<.01*
Diabetes	26 (17.0)	127 (83.0)	1.82	1.39	.87-2.24	.18
Hypertension	46 (30.1)	107 (69.9)	.56	1.16	.79-1.70	.45
Cardiovascular Disease	5 (3.3)	148 (96.7)	.00	.98	.37-2.60	.97
Elevated cholesterol	24 (15.7)	129 (84.3)	.02	1.04	.64-1.68	.88
Stroke	9 (5.9)	144 (94.1)	3.99	2.40	1.07-5.42	.05*
Cancer	4 (2.6)	149 (97.4)	.40	.72	.25-2.08	.53
Asthma	16 (10.5)	137 (89.5)	.98	.76	.43-1.33	.32
Depression/anxiety	18 (11.8)	135 (88.2)	.62	.81	.48-1.38	.43
News app						
Obesity	18 (15.8)	96 (84.2)	.00	.99	.58-1.69	.96
Diabetes	17 (14.9)	97 (85.1)	.21	1.14	.66-1.99	.64
Hypertension	28 (24.6)	86 (75.4)	.61	.84	.53-1.32	.44
Cardiovascular Disease	6 (5.3)	108 (94.7)	1.34	1.77	.71-4.43	.25
Elevated cholesterol	13 (11.4)	101 (88.6)	1.62	.68	.37-1.26	.20
Stroke	7 (6.1)	107 (93.9)	3.28	2.39	.99-5.76	.07
Cancer	4 (3.5)	110 (96.5)	.00	1.03	.35-2.99	.96
Asthma	14 (12.3)	100 (87.7)	.04	.94	.52-1.71	.85
Depression/anxiety	17 (14.9)	97 (85.1)	.15	1.12	.64-1.94	.70
Magazines						
Obesity	31 (15.4)	170 (84.6)	.05	.95	.62-1.46	.82
Diabetes	38 (18.9)	163 (81.1)	6.02	1.72	1.13-2.61	.01*
Hypertension	58 (28.9)	143 (71.1)	.21	1.09	.77-1.54	.65
Cardiovascular Disease	6 (3.0)	195 (97.0)	.09	.87	.35-2.16	.76
Elevated cholesterol	32 (15.9)	169 (84.1)	.08	1.06	.69-1.64	.78
Stroke	8 (4.0)	193 (96.0)	.63	1.41	.61-3.26	.43
Cancer	7 (3.5)	194 (96.5)	.00	1.02	.43-2.40	.97
Asthma	22 (11.0)	179 (89.0)	.86	.79	.49-1.30	.35
Depression/anxiety	24 (11.9)	177 (88.1)	.72	.82	.51-1.31	.40
Books						
Obesity	47 (16.0)	246 (84.0)	.00	1.01	.69-1.48	.95
Diabetes	42 (14.3)	251 (85.7)	.25	1.11	.74-1.66	.61
Hypertension	86 (29.4)	207 (70.7)	.68	1.14	.84-1.55	.41
Cardiovascular Disease	11 (3.8)	282 (96.3)	.25	1.21	.57-2.58	.62
Elevated cholesterol	42 (14.3)	251 (85.7)	.30	.90	.60-1.33	.58
Stroke	12 (4.1)	281 (95.9)	1.37	1.59	.74-3.40	.24
Cancer	13 (4.4)	280 (95.6)	1.27	1.53	.74-3.16	.26
Asthma	42 (14.3)	251 (85.7)	.85	1.21	.81-1.82	.36
Depression/anxiety	53 (18.1)	240 (81.9)	6.70	1.68	1.39-2.47	<.01*
Spouse						
Obesity	14 (16.1)	73 (83.9)	.00	1.01	.55-1.85	.97
Diabetes	10 (11.5)	77 (88.5)	.35	.82	.41-1.62	.55
Hypertension	17 (19.5)	70 (80.5)	3.32	.61	.35-1.06	.07
Cardiovascular Disease	3 (3.5)	84 (96.5)	.00	1.04	.31-3.51	.95
Elevated cholesterol	13 (14.9)	74 (85.1)	.01	.97	.52-1.80	.93
Stroke	6 (6.9)	81 (91.1)	3.58	2.67	1.05-6.78	.058
Cancer	3 (3.5)	84 (96.5)	.00	1.00	.30-3.38	.99
Asthma	8 (9.2)	79 (90.8)	1.24	.66	.31-1.41	.26
Depression/anxiety	16 (18.4)	71 (81.6)	1.64	.80	.53-1.20	.27
Friends						
Obesity	37 (13.9)	229 (86.1)	1.19	.80	.53-1.20	.27
Diabetes	35 (13.2)	231 (86.8)	.04	.96	.63-1.46	.84
Hypertension	66 (24.8)	200 (75.2)	1.46	.82	.59-1.14	.23

Cardiovascular Disease	10 (3.8)	256 (96.2)	.22	1.21	.56-2.61	.64
Elevated cholesterol	37 (13.9)	229 (86.1)	.58	.86	.57-1.29	.46
Stroke	13 (4.9)	253 (95.1)	3.70	2.13	1.00-4.54	.054
Cancer	8 (3.0)	258 (97.0)	.21	.83	.37-1.87	.65
Asthma	40 (15.0)	226 (85.0)	1.58	1.31	.86-1.97	.21
Depression/anxiety	40 (15.0)	226 (85.0)	.54	1.17	.76-1.75	.47

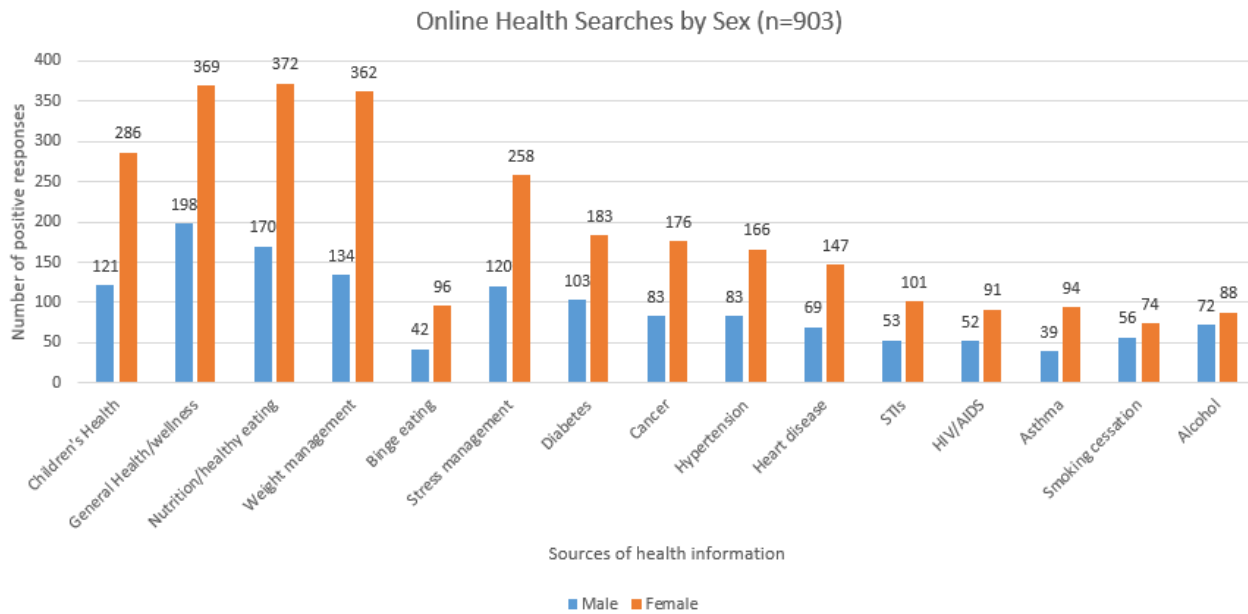
Online Health Searches

Most participants believed that the internet is useful in helping to make decisions about their health (women=79.7%, men= 76.8%), and there were no significant sex differences ($p>.05$). The internet was used daily (women=80.5%, men=73.2%), with women significantly more likely to have done so ($X^2=10.45$, $OR=2.32$, 95% $CI=1.21-4.48$, $p=.01$). The most recent online health search was for themselves (women=55.0%, men=66.1%), someone else (women=14.4%, men=15.0%), and both themselves and someone else (women 30.7%, men 19.2%). There were significant differences by sex ($X^2=13.61$, $p=.001$). Men were significantly more likely to do online searches for themselves ($OR=1.91$, 95% $CI=1.34$, $p<.0001$) while women were more likely to do searches for themselves and someone else ($OR=1.63$, 95% $CI=1.01-2.64$, $p=.04$).

Participants were asked to “choose all that apply” from 12 possible topics that they searched for online in the past 12 months. The top two searches were for information on general health and wellness (women=53.5%, men=53.1%) and nutrition/dieting (women=59.4%, men=37.9%).

Women were significantly more likely than men to have searched for information on nutrition/dieting, medication, diabetes, asthma, stress/depression/anxiety, and children’s health ($p<.05$ for all). See Figure 2.

Figure 2 Online Health Searches by Sex



Online health topic searches were also associated with reported diagnosis of certain health conditions. Notably, those who searched for general health and wellness information reported they had been diagnosed with diabetes, hypertension, elevated cholesterol, and cancer. Those who searched for information on general health and wellness were likely to report that they had been diagnosed with diabetes ($p<.001$ for all). Those who searched online for nutrition/dieting information were likely to report that they had been diagnosed with obesity, diabetes, stroke, and cancer ($p<.001$ for all).

Additionally, participants who searched for diabetes information were likely to report they had been diagnosed with obesity, diabetes, hypertension, and elevated cholesterol ($p<.05$ for all). Refer to Table 3 for significant results on the online health topic searches with the correspondent reported diagnosis.

Table 3. Online Health Searches by Diagnosis (n=903)

Variables	Yes		No		X ²	OR	95% CI	p
	n	(%)	n	(%)				
Children's Health/wellness								
Obesity	55	(13.4)	354	(86.6)	3.52	.71	.49-1.02	.06
Diabetes	35	(8.6)	374	(91.4)	16.27	.44	.29-.66	<.0001*
Hypertension	98	(24.0)	311	(76.0)	4.92	.72	.53-.96	.03*
Cardiovascular disease	11	(2.7)	398	(97.3)	.95	.69	.32-1.47	.33
High cholesterol	53	(13.0)	356	(87.0)	.72	3.15	.49-1.04	.08
Stroke	11	(2.7)	398	(97.3)	.43	.78	.36-1.67	.51
Cancer	7	(1.7)	402	(98.3)	7.15	.34	.15-.80	<.01*
Asthma	64	(15.7)	345	(84.3)	5.22	1.58	1.07-2.33	.02*
Depression/anxiety	68	(16.6)	341	(83.4)	5.26	1.56	1.07-2.28	.02*
Health/wellness								
Obesity	84	(14.8)	484	(85.2)	1.51	.80	.55-1.14	.22
Diabetes	67	(11.8)	501	(88.2)	3.78	.68	.46-1.00	.052
Hypertension	158	(27.8)	410	(72.2)	.05	1.03	.76-1.40	.83
Cardiovascular disease	18	(3.2)	550	(96.8)	.11	.88	.42-1.85	.74
High cholesterol	95	(16.7)	473	(83.3)	2.51	1.36	.92-2.01	.11
Stroke	17	(3.0)	551	(97.0)	.06	.91	.42-1.96	.81
Cancer	18	(3.2)	550	(96.8)	.32	.81	.39-1.68	.57
Asthma	68	(12.0)	500	(88.0)	1.03	.81	.55-1.21	.31
Depression/anxiety	81	(14.3)	487	(85.7)	.36	1.13	.76-1.68	.54
Nutrition/dieting								
Obesity	90	(16.5)	454	(83.5)	.37	1.12	.78-1.62	.55
Diabetes	60	(11.0)	484	(89.0)	7.07	.59	.40-.87	<.01*
Hypertension	160	(29.4)	384	(70.6)	2.33	1.26	.93-1.71	.13
Cardiovascular disease	15	(2.8)	529	(97.2)	1.33	.65	.31-1.34	.25
High cholesterol	81	(14.9)	463	(85.1)	.16	.93	.64-1.34	.69
Stroke	17	(3.1)	527	(96.9)	.00	1.02	.47-2.20	.96
Cancer	13	(2.4)	531	(97.6)	4.37	.46	.22-.96	.04*
Asthma	70	(12.9)	474	(87.1)	.00	1.00	.67-1.50	.98
Depression/anxiety	83	(15.3)	461	(84.7)	2.74	1.40	.94-2.08	.10
Weight management								
Obesity	109	(21.9)	388	(78.1)	31.10	2.98	1.98-4.47	<.0001*
Diabetes	71	(14.3)	426	(85.7)	.57	1.16	.79-1.70	.45
Hypertension	164	(33.0)	333	(67.0)	16.54	1.86	1.37-2.52	<.0001*
Cardiovascular disease	16	(3.2)	481	(96.8)	.04	.93	.45-1.93	.85
High cholesterol	89	(17.9)	408	(82.1)	5.98	1.59	1.09-2.32	.01*
Stroke	16	(3.2)	481	(96.8)	.05	1.09	.51-2.34	.82
Cancer	13	(2.6)	484	(97.4)	2.21	.58	.28-1.20	.14
Asthma	70	(14.1)	427	(85.9)	1.53	1.28	.86-1.91	.22
Depression/anxiety	77	(15.5)	420	(84.5)	2.93	1.40	.95-2.07	.09
Binge eating								
Obesity	27	(19.6)	111	(80.4)	1.52	1.35	.85-2.14	.22
Diabetes	13	(9.4)	125	(90.6)	2.53	.63	.34-1.15	.11
Hypertension	37	(26.8)	101	(73.2)	.05	.96	.64-1.44	.83
Cardiovascular disease	4	(2.9)	134	(97.1)	.09	.85	.29-2.47	.76
High cholesterol	21	(15.2)	117	(84.8)	.00	.99	.60-1.65	.98
Stroke	4	(2.9)	134	(97.1)	.02	.92	.31-2.70	.88
Cancer	3	(2.2)	135	(97.8)	.87	.58	.17-1.95	.35
Asthma	22	(15.9)	116	(84.1)	1.33	1.35	.82-2.24	.25
Depression/anxiety	25	(18.1)	113	(81.9)	2.48	1.49	.91-2.41	.12

Stress management

Obesity	61 (16.1)	317 (83.9)	.02	1.02	.71-1.47	.89
Diabetes	35 (9.3)	343 (90.7)	10.44	.51	.34-.78	<.01*
Hypertension	102 (27.0)	276 (73.0)	.11	.95	.71-1.28	.73
Cardiovascular disease	9 (2.4)	369 (97.6)	1.86	.58	.27-1.29	.17
High cholesterol	55 (14.6)	323 (85.4)	.27	.91	.63-1.31	.60
Stroke	12 (3.2)	366 (96.8)	.01	1.04	.49-2.23	.91
Cancer	9 (2.4)	369 (97.6)	2.26	.56	.26-1.23	.13
Asthma	51 (13.5)	327 (86.5)	.24	1.10	.74-1.64	.62
Depression/anxiety	95 (74.9)	283 (25.1)	71.96	5.74	3.70-8.92	<.0001*

Diabetes

Obesity	60 (20.9)	227 (79.1)	7.44	1.67	1.16-2.41	<.01*
Diabetes	81 (28.2)	206 (72.8)	72.17	5.51	3.67-8.29	<.0001*
Hypertension	103 (35.9)	184 (64.1)	14.19	1.80	1.30-2.44	<.001*
Cardiovascular disease	13 (4.5)	274 (95.5)	1.82	1.67	.80-3.49	.18
High cholesterol	60 (20.9)	227 (79.1)	9.85	1.82	1.26-2.64	<.01*
Stroke	9 (3.1)	278 (96.9)	.00	1.02	.45-2.28	.97
Cancer	11 (3.8)	276 (96.2)	.20	1.18	.56-2.51	.66
Asthma	42 (14.6)	245 (85.4)	1.18	1.26	.84-1.89	.28
Depression/anxiety	46 (16.0)	241 (84.0)	1.83	1.32	.89-1.95	.18

Cancer

Obesity	35 (13.5)	225 (86.5)	1.73	.76	.51-1.15	.19
Diabetes	31 (11.9)	229 (88.1)	.80	.82	.53-1.27	.37
Hypertension	77 (29.6)	183 (70.4)	.76	1.15	.84-1.58	.39
Cardiovascular disease	12 (4.6)	248 (95.4)	1.79	1.68	.80-3.54	.18
High cholesterol	42 (16.2)	218 (83.8)	.21	1.10	.74-1.63	.65
Stroke	9 (3.5)	251 (96.5)	.16	1.18	.53-2.64	.69
Cancer	13 (5.0)	247 (95.0)	2.52	1.83	.88-3.79	.11
Asthma	37 (14.2)	223 (85.8)	.62	1.18	.78-1.80	.43
Depression/anxiety	41 (15.8)	219 (84.2)	1.25	1.26	.84-1.89	.24

Hypertension

Obesity	51 (20.4)	199 (79.6)	4.91	1.54	1.06-2.25	.03*
Diabetes	44 (17.6)	206 (82.4)	4.73	1.57	1.05-2.35	.03*
Hypertension	128 (51.2)	122 (48.8)	91.10	4.61	3.36-6.33	<.0001*
Cardiovascular disease	13 (5.2)	237 (94.8)	3.48	2.05	.98-4.29	.06
High cholesterol	59 (23.6)	191 (76.4)	17.24	2.24	1.54-3.27	<.0001*
Stroke	13 (5.2)	237 (94.8)	4.60	2.33	1.09-4.98	.03*
Cancer	12 (4.8)	238 (95.2)	1.83	1.68	.80-3.52	.18
Asthma	37 (14.8)	213 (85.2)	1.15	1.26	.83-1.92	.28
Depression/anxiety	44 (17.6)	206 (82.4)	4.19	1.53	1.02-2.28	.04*

STIs

Obesity	23 (14.9)	131 (85.1)	.14	.91	.56-1.48	.70
Diabetes	12 (7.8)	142 (92.2)	5.84	.49	.26-.92	.02*
Hypertension	32 (20.8)	122 (79.2)	4.50	.64	.42-.98	.03*
Cardiovascular disease	3 (2.0)	151 (98.0)	1.24	.53	.16-1.77	.27
High cholesterol	16 (10.4)	138 (89.6)	3.72	.60	.34-1.04	.053
Stroke	6 (3.9)	148 (96.1)	.37	1.34	.53-3.36	.54
Cancer	1 (0.7)	153 (99.3)	6.07	.16	.02-1.18	.01*
Asthma	23 (14.9)	131 (85.1)	.70	1.24	.76-2.03	.40
Depression/anxiety	32 (20.8)	122 (79.2)	7.09	1.87	1.20-2.93	<.01*

HIV/AIDS

Obesity	23 (16.1)	120 (83.9)	.00	1.01	.62-1.65	.96
Diabetes	13 (9.1)	130 (90.9)	3.10	.60	.33-1.09	.08

Hypertension	37 (25.9)	106 (74.1)	.25	.90	.61-1.35	.62
Cardiovascular disease	5 (3.5)	138 (96.5)	.02	1.07	.40-2.83	.90
High cholesterol	11 (7.7)	132 (92.3)	8.72	.42	.22-.79	<.01*
Stroke	7 (4.9)	136 (95.1)	1.61	1.81	.76-4.34	.20
Cancer	3 (2.1)	140 (97.9)	1.03	.56	.17-1.87	.31
Asthma	23 (16.1)	120 (83.9)	1.51	1.37	.84-2.26	.22
Depression/anxiety	36 (25.2)	107 (74.8)	16.30	2.57	1.65-3.98	<.0001*
Asthma						
Obesity	21 (15.7)	113 (84.3)	.01	.98	.59-1.62	.92
Diabetes	16 (11.9)	118 (88.1)	.34	.85	.48-1.49	.56
Hypertension	40 (29.9)	94 (70.1)	.40	1.14	.76-1.71	.53
Cardiovascular disease	4 (3.0)	130 (97.0)	.06	.88	.30-2.56	.81
High cholesterol	14 (10.5)	120 (89.5)	3.09	.42	.34-1.09	.08
Stroke	5 (3.7)	129 (96.3)	.20	1.26	.47-3.37	.66
Cancer	3 (2.2)	131 (97.8)	.75	.61	.18-2.02	.39
Asthma	60 (44.8)	74 (55.2)	106.98	10.32	6.68-15.96	<.0001*
Depression/anxiety	34 (25.4)	100 (74.6)	15.55	2.57	1.64-4.01	<.0001*
Smoking cessation						
Obesity	24 (18.5)	106 (81.5)	.69	1.23	.76-2.00	.41
Diabetes	11 (8.5)	119 (91.5)	3.68	.55	.29-1.06	.06
Hypertension	37 (25.9)	106 (74.1)	.44	1.15	.76-1.73	.51
Cardiovascular disease	6 (4.6)	124 (95.4)	.72	1.51	.61-3.77	.40
High cholesterol	21 (16.2)	109 (83.8)	.09	1.08	.65-1.79	<.01*
Stroke	9 (6.9)	121 (93.1)	5.86	2.95	1.31-6.68	.02*
Cancer	5 (3.9)	125 (96.1)	.08	1.15	.43-3.05	.78
Asthma	22 (16.9)	108 (83.1)	2.11	1.47	.89-2.44	.15
Depression/anxiety	37 (28.5)	93 (71.5)	23.34	3.14	2.02-4.88	<.0001*
Alcohol						
Obesity	24 (18.5)	106 (81.5)	.69	1.23	.76-2.00	.40
Diabetes	11 (8.5)	119 (91.5)	3.68	.55	.29-1.06	.06
Hypertension	39 (30.0)	91 (70.0)	.44	1.15	.76-1.73	.50
Cardiovascular disease	6 (4.6)	124 (95.4)	.72	1.51	.61-3.77	.40
High cholesterol	21 (16.2)	109 (83.8)	.09	1.08	.65-1.79	.77
Stroke	9 (6.9)	121 (93.1)	5.87	2.95	1.31-6.68	.02*
Cancer	5 (3.9)	125 (96.1)	.08	1.15	.43-3.05	.78
Asthma	22 (16.9)	108 (83.1)	2.11	1.47	.89-2.44	.15
Depression/anxiety	37 (28.5)	93 (71.5)	23.34	3.14	2.02-4.88	<.0001*

Discussion

The present study examined technology use, sources of health information, and online health seeking behavior information among AA. The results showed that most participants owned smartphones, believed the Internet was helpful for making health decisions, rated their health between good and excellent, and had not been diagnosed with a chronic disease. The prevalence of HISB from online and traditional sources was relatively high, and participants used multiple sources for health information. Furthermore, the study found significant relationships between the diagnosis of various health conditions and HISB. Additionally, there were significant differences in HISB between women and men.

Device Ownership and Technology Use

The scope, speed, and adoption of communication and information technology has grown tremendously in the past decade and is expected to continue (DHHS, 2009). Studies show a narrowing of the gap in the “digital divide” between those who have access to the internet and digital technology and those who don’t (Hitlin, 2018; Smith, 2017). Although the divide has narrowed over time, there are still interesting contrasts between AA and the general population in the ownership, use, and access to technology (Perrin, 2017).

Most participants in the study owned smartphones and the prevalence of ownership in this sample was slightly higher than the national average at the time the data was collected in 2015 (70% vs. 64%). However, it was the same as a national sample of AA (70% vs. 70%) during the same period (Smith & Paige, 2015). Smartphone ownership has grown since then among all groups, with current data showing AA with slightly lower but comparable numbers (75% vs. 77%) to the general population (Pew, 2018a). A significant proportion of Americans are smartphone dependent, which means that they do not have home broadband and use their phones as their primary internet access. Nationally, AA are more likely to be smartphone dependent than the general population (24% vs. 20%), and almost twice as likely as Whites (24% vs. 14%) (Pew, 2018a). The sample in this study had similar levels of smartphone dependence compared to the national sample of AA. As with the general population, AA owned a variety of mobile devices and accessed the internet from a variety of sources, including public libraries. About 36% of participants in the present study accessed the internet regularly from public libraries.

A recent study showed that AA were twice as likely as whites to report that having a library nearby and better library hours would greatly benefit their access to information (Horrigan & Gramlich, 2017). Since public libraries offer free internet that can either be accessed through library computers or patrons' own devices, play important roles for online HISB among AA and other underserved populations.

Sources of Health Information

In addition to rating their health between good and excellent, most participants reported having an annual exam by a physician in the past 12 months. Thus, it was not surprising that physicians were the most popular source of health information, especially for women. Women were also more likely than men to select nurses as sources of health information. This is in line with other research that report that individuals often perceive healthcare providers to be more trustworthy and credible than other sources (Lenz, 1984; Mishel, 1988). Additionally, studies show that AA are more likely to rely on healthcare providers rather than their personal network as their primary sources of health information (Jacobs, Amutal, & Jeon et al., 2017).

The internet was the second most common source of health information for participants. This is significant since it suggests that many participants may be doing online health searches to complement or clarify, rather than replace information and advice from health care providers. This is in line with studies that suggest that individuals who have regular medical visits are also more likely to pay attention to health information presented on the internet and other sources (Ruppel & Rains, 2012). Many participants still relied on TV (40%) and newspapers/magazines (39%) as sources of health information. This is interesting since the use of TV and the circulation of print and digital magazines/newspapers is declining nationally (Marketing Charts, 2019; Pew Research Center, 2018b). Notably, men were significantly more likely than women to use these as sources of health information. This is somewhat concerning since AAM have one of the lowest life expectancies, experience some of the worst health outcomes for many diseases, and less likely to participate in preventive health care (DHHS, 2009).

Additionally, the information presented by traditional media is geared towards the public and often focus on "hot topics" and late breaking news (Moeller, Trilling, Helberger, Irion, & De Vreese, 2016). Thus, using these media sources for health information will do little to decrease their health risk and improve their health and wellbeing. However, it is possible that these participants rely on traditional media sources for information such as changing healthcare laws and policies, drug recalls, and diseases outbreaks rather than for information on self-care.

Online Health Searches

Participants had high ownership of, which are essential tools for online HISB. Research shows that due to their high level of smartphone dependence, AA are more likely than whites to use smartphones to search for health information (Perrin, 2017). Most participants believed the internet is useful for making health decisions. Thus, it is notable that their primary online health search was for information on general health and wellness. This suggests that they were very interested in self-care and preventive care. This is significant since about 70% of deaths among Americans can largely be prevented with lifestyle changes and preventive measures (Centers for Disease Control and Prevention, 2017). Additionally, it also suggests that, with community-based engagement and formative research, opportunities exist to create and disseminate health promotion and disease prevention messages, campaigns, and other activities that can be delivered online. The study also found that most participant also searched online for information on nutrition and dieting. This is significant considering the high prevalence of overweight and obesity among AA, especially AA women.

In fact, AA women have the highest prevalence of obesity (58%) among all races/ethnicities and gender in the United States (Ogden, Carroll, Kit, & Flegal, & 2014). Obesity greatly increases the risk for lower life expectancy, and higher rates of chronic diseases (DHHS, 2015; DHHS, 2009), and other negative psychosocial outcomes than those that are not obese (Seagle, Strain, Makris & Reeves, 2009). The mean BMI for both men and women in the study classified them as overweight. Furthermore, women also had significantly higher mean BMI than men and were more likely to be classified as obese. Thus, it was not surprising that the women were significantly more likely than men to have searched online for information on nutrition and dieting. This shows that AAW are concerned about their weight and are possibly looking for information to manage their weight. Thus, opportunities exist for AA, especially women, to be engaged with credible, online weight management information.

While most participants searched online for health information for themselves, many also searched for someone else. This is consistent with national data (Fox, Duggan, & Purcell, 2013). It was not surprising that women were more likely to search for health information for themselves as well as someone else since women carry a significant bulk of the caregiving for children, elderly parents, and other sick family members (National Alliance of Caregivers, 2015). Studies show that caregivers are more likely than non-caregivers to go online to find information about the illness/condition, medication, and social support (Fox, Duggan, & Purcell, 2013). Thus, credible, online health information targeted to women and caregivers have the potential to positively impact the health of a much wider audience.

Health Diagnosis and Health Seeking Behavior

Information seeking is a key behavior for managing one's health. About 30% of participants reported that a physician had diagnosed them with a disease, with hypertension being the most common diagnosis for both men and women. It is also important to note that physicians were significantly more likely to be the primary source of information for those diagnosed with obesity, diabetes, hypertension, and anxiety/depression. Additionally, those diagnosed with obesity, asthma, and anxiety/depression were significantly more likely to report nurses as a source of health information. This is also in line with other research that report that individuals with medical conditions and those at higher risk for certain diseases and conditions rely heavily on healthcare providers for health information (Jacob, et al., 2017).

Participants who were diagnosed with illnesses also used the internet as a source of health information, which is consistent with studies that report that consumers use multiple sources of health information (Ruppel & Rains, 2012). Interestingly, many participants who searched online for information on general health and wellness information reported they had been diagnosed with diabetes, hypertension, elevated cholesterol, and cancer. Additionally, those who searched online for nutrition/dieting information were likely to report that they had been diagnosed with obesity, diabetes, stroke, and cancer. Thus, it is likely that these individuals were interested in making lifestyle changes to improve and/or self-manage their conditions.

Conclusions and Implications

The high ownership of mobile devices and increased access to the internet among AA, low-income individuals, and other underserved populations will create a new paradigm that will transform the types of culturally appropriate health information, messages, and campaigns that will be delivered online. This study adds to the literature in several ways. First, AA believe the internet to be useful for making health decisions, which means that opportunities exist to improve their overall knowledge of health issues as well as digital literacy and eHealth literacy. Second, they have a variety of ways to access online health information, which provides opportunities to create and disseminate health information using various platforms that are mobile friendly and that can be downloaded and accessed offline. Third, since AA continue to express varying degrees of mistrust of researchers and the healthcare system, there are numerous opportunities for AA researchers, clinicians, public health educators, and other qualified professionals to engage the AA community online through articles, videos, blogs, social media, and other emerging media. Fourth, in addition to being culturally specific, online health information may need to be tailored to gender and age group (James, Whitehead, Harville, Stellefson, Dodani, & Sears, 2017).

Limitations

This study had several limitations. First, a convenience sample was used, which limits generalizability of the findings. Second, it is not possible to infer causal relationships between the constructs in the survey. Third, while the

participants were asked about the health searches in the past 12 months, the frequency of online health information seeking or the motivation for seeking health information were not assessed.

Thus, it is possible that distinguishing between frequent and infrequent online HISB health might have provided additional information. However, this was outside the scope of the study. Fourth, for those who had diagnosed medical conditions, the seriousness and the stage of their illness were not asked. But, this was not the focus of the study. Fifth, there was a high proportion of female respondents, which may have explained the number of gender-related significant findings. Despite these limitations, the results have some practical applications to researchers and practitioners who are interested in developing and evaluating online health messages and programs for AA.

Compliance with Ethical Standards

Conflict of interest

The authors declare that they have not conflict of interests.

References

- Bhandari, N., Shi, Y., & Young, K. (2014). Seeking health information online: Does limited healthcare access matter? *Journal of the Medical Informatics Association*, 21(6), 1113-1117.
- Fox, S., & Duggan, M. (2013, January 15). Health online 2013. Retrieved from <https://www.pewinternet.org/2013/01/15/health-online-2013/>.
- Schull, N.D. (2016). Data for life: Wearable technology and the design of self-care. *BioSocieties*, 11, 317-333. Retrieved from <https://link.springer.com/content/pdf/10.1057%2Fbiosoc.2015.47.pdf>.
- Sarasohn-Kahn, J. (2013). A role for patients: The argument for self-care. *American Journal of Preventive Medicine*, 44(1S1), S16-S18.
- U.S. Department of Health and Human Services [DHHS]. *Healthy People 2020: The Road Ahead*. (2009, November 3). Retrieved from <http://www.health.gov/healthypeople/url/>.
- Jacobs, W., Amuta, A., & Jeon, K. C. (2017). Health information seeking in the digital age: An analysis of health information seeking behavior among U.S. adults. *Cogent Social Sciences*, 3(1), 1302785. <http://dx.doi.org/10.1080/23311886.2017.1302785>.
- Lambert, S., & Loisel, C. (2007). Health information seeking behavior. *Qualitative Health Research*, 17(8), 1006–1019. <http://dx.doi.org/10.1177/1049732307305199>
- Department of Health and Human Services: Office of the National Coordinator for Health Information Technology. *Federal Health IT Strategic Plan 2015–2020*. Retrieved from https://www.healthit.gov/sites/default/files/9-5-federalhealthitstratplanfinal_0.pdf.
- Mukherjee, A., & Bawden, D. (2012). Health information seeking in the information society. *Health Information and Library Journal*, 29(3), 242–246. <https://doi.org/10.1111/j.1471-1842.2012.00997.x>.
- Perrin, A. (2017). Smartphones help blacks, and Hispanics bridge some—but not all-digital gaps with whites. Retrieved from <http://www.pewresearch.org/fact-tank/2017/08/31/smartphones-help-blacks-hispanics-bridge-some-but-not-all-digital-gaps-with-whites/>.
- Mills, A., & Todorova, N. (2016). An integrated perspective on factors influencing online health-information seeking behaviours. *Australasian Conference on Information Systems*, 4, 6.
- Atkin, C. K. (1973). Instrumental utilities and information seeking. In P. Clarke (Ed.), *New Models for Communication Research* (pp. 205-242). Beverly Hills, CA: Sage.
- Griffin, R.J., Dunwoody, S., Neuwirth, K. (1999). Proposed for the relationship of risk information seeking and processing to the development of preventive behaviors. *Environmental Research*, 80(2), S230-S235.
- Ruppel, E.R. & Rains, S.A. (2012). Information sources and the health information-seeking process: An application and extension of channel complimentary theory. *Communication Monograph*, 79(3), 385-305. <https://doi.org/10.1080/03637751.2012.697627>.
- Weaver, J.B., Mays, D., Weaver, S.S., Hopkins, G., L., Eroglu, D., & Bernhardt, J. (2010). Health information-seeking behaviors, health indicators, and health risks. *American Journal of Public Health*, 100(8), 1520-1525.
- Statista. (2019a, April). Global digital population as of January 2019. Retrieved from <https://www.statista.com/statistics/617136/digital-population-worldwide/>.

- Statista. (2019b). Number of internet users in the United States 2017 to 2023. Retrieved from <https://www.statista.com/statistics/325645/usa-number-of-internet-users/>.
- Tonsker, T., Bartlett, G., & Trpkov C. (2014). Health information on the internet: Gold mine or minefield? *Canadian Family Physician*, 60(5), 407-408.
- Smith, A. (2017, January 12). Record shares of Americans now own smartphones, have home broadband. Retrieved from <https://www.pewresearch.org/fact-tank/2017/01/12/evolution-of-technology/>.
- Pew Research Center. (2018a, February 5). Mobile fact sheet. <https://www.pewinternet.org/fact-sheet/mobile/>.
- Patel, V., Barker, W., & Siminerio, E. (2015). *Trends in Consumer Access and Use of Electronic Health*. Retrieved from <http://dashboard.healthit.gov/evaluations/data-briefs/trends-consumer-access-use-electronic-health-information.php>.
- Zickuhr, K. & Smith, A. (2012, April 13). *Digital Differences*. Retrieved from <http://pewinternet.org/Reports/2012/Digital-differences.aspx>.
- Bjarnadottir, M.I., Millery, M., Fleck, E., & Bakken, S. (2016). Correlates of online health information seeking behaviors in a low-income Hispanic community. *Informatics in Health and Social Care*, 41(4), 341-349.
- Hitlin, P. (2018, September 28). *Internet, social media use and device ownership in U.S. have plateaued after years of growth*. Retrieved from <https://www.pewresearch.org/fact-tank/2018/09/28/internet-social-media-use-and-device-ownership-in-u-s-have-plateaued-after-years-of-growth/>.
- Smith, A. & Paige, D. (2015). *U.S. Smartphone use in 2015*. Pew Internet and American Life Project. Retrieved from http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf.
- Horrigan, J.B. & Gramlich, J. (2017). Many Americans especially blacks and Hispanics, are hungry for help as they sort out information. Available from <http://www.pewresearch.org/fact-tank/2017/11/29/many-americans-especially-blacks-and-hispanics-are-hungry-for-help-as-they-sort-through-information/>.
- Lenz, E. R. (1984). Information seeking: A component of client decisions and health behavior. *Advances in Nursing Science*, 6(3), 59-72.
- Mishel, M. H. (1988). Uncertainty in illness. *Image—The Journal of Nursing Scholarship*, 20, 225-232.
- Marketing Charts (2019, April 3). *The state of traditional TV: Updated with Q3 2018 data*. Retrieved from <https://www.marketingcharts.com/featured-105414>.
- Pew Research Center (2018b, June 13). *Newspapers fact sheet*. Retrieved from <https://www.journalism.org/fact-sheet/newspapers/>.
- Moeller, J., Trilling, D., Helberger, N., Irion, K., & De Vreese, C. (2016). Shrinking core? Exploring the differential agenda setting power of traditional and personalized news media. *Info*, 18(6), 26-41.
- Centers for Disease Control and Prevention. (2017). *Preventive care*. Retrieved from <https://www.cdc.gov/healthcommunication/toolstemplates/entertainmented/tips/PreventiveHealth.html>.
- Ogden, C.L., Carroll, M.D., Kit, B.K., & Flegal, K.M. (2014). Prevalence of childhood and adult obesity in the United States, 2011-2012. *The Journal of the American Medical Association*, 311(8), 806-814. doi: 10.1001/jama.2014.732.
- U.S. Department of Health and Human Services [DHHS]. (2015, May). *Health, United States, 2014*. Retrieved from <http://www.cdc.gov/nchs/data/hus/hus14.pdf#064>.
- Seagle, H.M., Strain, G.W., Makris, A., & Reeves, R.S. (2009). Position of the American Dietetic Association: weight management. *Journal of the American Dietetic Association*, 109, 330-346.
- Fox, S., Duggan, M., & Purcell, K. (2013, June 20). *Family care givers are wired for health*. Retrieved from <https://www.pewinternet.org/2013/06/20/family-caregivers-are-wired-for-health/>.
- National Alliance of Caregivers. (2015). *Caregiving in the U.S. 2015*. Retrieved from <https://www.caregiving.org/caregiving2015/>.
- James, D.C.S., Whitehead, N., Harville, C., Stellefson, M., Dodani, S., & Sears, C. (2016). Willingness of African American women to participate in e-Health/m-Health research. *Telemedicine & e-Health*, 22(3), 191-197.