

Use of Health-Related Online Support Groups: Population Data from the California Health Interview Survey Complementary and Alternative Medicine Study

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OBJECTIVE: The purpose of this study was to evaluate the prevalence of online support group (OSG) use by those with chronic health problems and to identify characteristics associated with use of OSGs and face-to-face groups. METHODS: 6, 795 Californians living with chronic health problems were asked to describe OSG use, face-to-face support group use, and frequency/perceived benefit of support group use. RESULTS: 16% had used a face-to-face group for health, and 1.8% reported having used an OSG. OSG use was associated with depression/anxiety (OR = 3.51), stroke (OR = 3.03), diabetes (OR = 2.96), cancer (OR = 2.86), and arthritis (OR = 2.52). Use of OSGs was also associated with greater education (OR = 12.2), higher income (OR = 3.1), use of complementary/alternative therapies (OR = 5.2), and worse health status (OR = 3.1). Those with asthma (OR = 0.4), over age 65 (OR = 0.2), and Latinos (OR = 0.2) were

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less likely to use OSGs. CONCLUSION: Prevalence of use of OSGs for those with chronic health conditions is low, but internet-based health-related services have potential to increase the reach of support services for those living with chronic conditions.

Key words: internet, online, support, adult, survivorship.

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Introduction

As of early 2009, 74% of adults in the U.S. population were active users of the Internet (Pew Internet and American Life Project, 2008). The rapid growth and near saturation of this communication medium (Licciardone, 2001) is dramatically changing the ways in which individuals search for, find, and use health information (Fox, 2008). To take advantage of these changes, health researchers and others have sought to develop and deliver Internet-based applications, including online support groups, that address a wide-range of health-related informational, emotional, and supportive needs (Beckjord et al., 2007; Escoffery et al., *in press*; Zrebiec & Jacobson, 2001). Efficacy studies show positive effects of participation in online support groups (Gustafson, Hawkins, Boberg et al., 1999; Lieberman, Golant, Giese-Davis et al., 2003; Owen, Klapow, Roth, Shuster et al., 2005; Winzelberg, Classen, Alpers et al., 2003), but very little is known about the reach or public health impact of OSGs outside of research settings. The present study sought to identify 1) the prevalence of online support group use and 2) predictors of utilization in the general population and among those with chronic health conditions.

The Internet has substantial promise as an agent for promoting public health (Cassell, Jackson, & Chevront, 1998). Use of the Internet to obtain health information is widespread (Pew, 2000) and has been shown to improve individuals' self-efficacy for actively participating in their medical care (Bass, Ruzek, Gordon, Fleisher, et al., 2006). Further, the social aspects of Internet communication have the potential to significantly impact the ways in which health information is exchanged and utilized. For example, social interactions in online groups have been shown to increase both the perceived credibility and persuasiveness of health information (Wang, Walthers, Pingree, & Hawkins, 2008). Online support groups (OSGs) provide an environment for social interactions that can connect individuals who share particular personal characteristics or specific health concerns and facilitate the direct exchange of health information (Owen, JBM, 2004). In addition, OSGs provide other health-relevant benefits, including social support (Barrera, Glasgow, McKay, Boles, & Feil, 2002; Coulson, Buchanan, & Aubeeluck, 2007; Mo & Coulson, 2008), opportunities for emotional expression (Lieberman & Goldstein, 2006; Liess, Simon, Yutsis, Owen et al., 2008), and ways to cognitively process health concerns or experiences (Owen, Klapow, Roth, Shuster, et al., 2005).

Online support groups have received substantial attention in the health communication literature. Communication patterns in online support groups have been descriptively and qualitatively characterized for a range of health conditions, including maternity care (Kouri et al., 2006), hysterectomy patients (Bunde et al., 2006), individuals with irritable bowel syndrome (Coulson, 2005), cancer (Rimer et al., 2005; Winefield, 2006), infertility (Himmel et al., 2005), cirrhosis (Lasker et al., 2005), and parents of children with Rett syndrome (Leonard et al., 2004). Additionally, randomized studies have demonstrated positive health benefits of OSG participation for those with bulimia and binge eating disorders (Ljottson et al., *in press*), social phobia (Andersson et al., 2006), a family member who requires extensive caregiving (Marziali & Donahue, 2006), overweight (Williamson et al., 2005), depression (Andersson et al., 2005), panic disorder (Klein, Richards, & Austin, 2006), poor diets (Papadaki & Scott, 2005), breast cancer (Winzelberg et al., 2003), and chronic headache (Devineni & Blanchard, 2005).

While these studies are encouraging, little is known about the public health impact of online support groups. A necessary preliminary step is to identify the prevalence of OSG use and to understand characteristics of users in the population. Unfortunately, population-level research on these questions is sparse, and most of the research is directed at use of health information rather than use of online support groups. In a study conducted by the Pew Internet and American Life Project (2000), 55% of 12,750 Internet users reported using the Internet for health-related information, and 9% of those who had used the Internet for health information reported having used an OSG (2.5% of all telephone respondents- Pew 2000; Houston & Allison, 2002). In a separate population survey of 917 individuals, 34% reported having used the Internet for health-related information, nearly 11% had used the Internet for information specifically related to mental health, and 1% reported having used online chats to discuss mental health-related issues (Powell & Clarke, 2006). Little is known about the prevalence of OSG use among those with a chronic health condition or which individual characteristics might be associated with OSG use.

The Behavioral Model of Health Services Use provides a theoretical framework that is potentially useful for identifying characteristics of OSG users (Andersen & Newman, 1973). Extending this model to OSGs, utilization is likely to be associated with Predisposing factors (i.e., gender, age, race/ethnicity, insurance status, use of complementary and alternative therapies), Enabling factors (i.e., income and education), and Illness factors (i.e., health and psychological status). However, population-based studies have not yet been used to examine how these characteristics might influence use of OSGs. Some data exist to suggest that both Predisposing and Enabling variables are predictive of use of Internet-based health information. Women (Lieberman & Huang, 2008), those at younger ages (Cotten & Gupta, 2004; Grant et al., 2005; Hall et al., 2005; Murray et al., 2003; Lieberman & Huang, 2008), Asians or Caucasians (Murray et al., 2003), and those with greater education (Cotten & Gupta, 2004; Grant et al., 2005; Hall et al., 2005; Murray et al., 2003) and income (Cotton & Gupta, 2004; Murray et al., 2003) are more likely to use the Internet to find

health-related information. In the absence of data specific to OSGs, we hypothesized that these characteristics of Internet information-seekers would be shared with users of OSGs.

We also anticipated that Illness factors (i.e., physical and psychological health) would be associated with use of health-related online support groups. Houston and Allison (2002) have reported that individuals who describe their health as fair or poor used the Internet for health information more frequently and were more likely to have used an OSG or chat room than individuals who described their health as excellent. We also sought to evaluate the impact of psychological health on the use of OSGs for health and to determine the relationship, if any, between use of online and face-to-face support groups. Previous studies have also suggested that those with chronic health conditions are more likely to turn to face-to-face support groups for health (Owen, Goldstein, Lee, Breen, & Rowland, 2007). Very little is known about how many individuals living with a chronic condition actually turn to online, health-related support groups and what characteristics distinguish these individuals from those who use face-to-face support or no support at all.

The purpose of this study was to evaluate how health-related OSGs are used in the general population and those living with chronic health problems in particular. To accomplish this aim, we used data obtained from the California Health Interview Survey Complementary and Alternative Medicine (CHIS-CAM) follow-back study (Goldstein et al., 2005). CHIS-CAM offers the opportunity to examine OSG use across the diverse population of California residents. We hypothesized that the prevalence of OSG use would be higher among those with a chronic disease than among healthy individuals. Additionally, we hypothesized that for those living with a chronic health condition, predisposing, enabling, and illness factors would be associated with OSG use. Finally, we sought to identify personal characteristics that distinguished between those who participated in a face-to-face support group related to health and those who participated in an OSG. We hypothesized that those who are likely to be underrepresented in face-to-face support groups (males, those living farther away from large healthcare facilities, and those with more severe health impairments) would be more likely to use OSGs.

Methods

Participants

Participants who completed the 2001 California Health Interview Survey (CHIS 2001, $n = 55,428$) and expressed willingness to be involved in future studies were eligible for participation in the current CHIS-CAM study (approximately 80% of CHIS 2001 participants agreed to be contacted for future studies). The sampling frame for CHIS-CAM included all CHIS 2001 respondents reporting a history of cancer (excluding non-melanoma skin cancers) and a sample, stratified by race and ethnicity, of the remaining respondents. A total of 9,187 participants completed the CHIS-CAM survey ($n = 1,844$ with history of cancer, $n = 4,951$ with a

non-cancerous chronic condition, and $n = 2,392$ with no chronic condition). The unadjusted response rate for CHIS-CAM (56%) was higher than for CHIS-2001, and response rates were higher for cancer survivors (68.9%) than for those without cancer (53.1%). The adjusted response rate, after excluding those who could not be reached by telephone, was 77.3%.

Procedure

Between January and April 2003, computer-assisted telephone interviews (CATI) were conducted by trained interviewers who had completed at least two training sessions on interviewing techniques specific to use of the CHIS-CAM CATI system. CHIS-CAM interviews lasted 14.1 minutes on average and were conducted in English, Spanish, Korean, Cantonese, and Mandarin.

Measures

Socio-demographic characteristics of participants were obtained from responses provided for the CHIS-2001 survey, including gender, race/ethnicity, place of residence, educational attainment, and income level. Ages were derived from the age information provided for CHIS-2001 and the date of the CHIS-CAM interview. To ascertain health insurance status, CHIS-CAM interviewers asked participants whether they currently held any type of health insurance or were enrolled in an HMO that paid any of the cost of medical care. Additionally, participants were asked whether they had ever been told by a doctor that they had cancer of any kind, asthma, lung or breathing problems, a heart condition or cardiovascular disease, chronic obstructive pulmonary disease, arthritis or rheumatism, back or neck problems, stroke, diabetes, hypertension, or depression or anxiety disorder. Disease condition was classified as present (1) or absent (0) for each of the 12 conditions assessed. General health status was measured using the single-item health status measure from the SF-36: participants were asked to describe their general health as being "excellent," "very good," "good," "fair," or "poor." Participants were also asked about use of a wide variety of complementary and alternative medicine (CAM) practices over the previous 12 months. Responses were compiled and used to categorize 2 groups: those who had used any form of CAM in the past year and those who had not. After being asked a series of questions about use of face-to-face health-related support groups (i.e., ever used, frequency of use, perceived benefit of use), participants were asked, "have you ever participated in a support group over the Internet?" Among those indicating that they had used an OSG, frequency of participation and degree of perceived benefit were also evaluated. Participants were asked to indicate how many OSG sessions they had attended in the past 12 months. Benefit was assessed by asking "how much has participating . . . helped you?" with the following response options: "not at all," "some," "a lot," or "can't tell." Those who reported "some" or "a lot" of benefit were classified as having benefited from participation in the OSG.

Statistical methods

To evaluate the relationship between each of the chronic disease conditions and use of OSGs, use of OSGs was regressed onto each disease condition in separate logistic regression models. To adjust for demographic differences across disease conditions, covariates in these analyses included gender, age, ethnicity, poverty level, and education. Logistic regression was also used to measure associations between demographic and medical variables and the dependent variable “use of online support groups”. The same logistic regression model was employed to evaluate predictors of perceived benefit of participation in OSGs among those who participated in an OSG. Predictors of frequency of participation in OSGs were evaluated using linear regression models. Chi-square analyses were conducted to identify differences in demographic characteristics between those who had used only face-to-face support groups and those who had used an OSG. We also sought to identify characteristics associated with use of OSGs among healthy adults. Because utilization of OSGs was low in this population ($n = 17$) compared to those with a chronic health condition, models evaluating perceived benefit and frequency of use could not be tested. All analyses were conducted using SAS-callable SUDAAN. A sample weighting procedure was used to adjust for differential response rates within the sampling frame, reduce the variance of statistical estimates, and provide unbiased, representative estimates of population parameters.

Results

Participant demographics and use of support groups for health

Demographic characteristics of the CHIS-CAM participants are provided in Table 1. As expected, there were a number of sociodemographic differences between participants with and without a chronic disease. Those living with a chronic disease were more likely to be female, older, Caucasian, have health insurance, have higher income, have greater educational attainment, and to have used CAM in the past 12 months. Twelve and one half percent ($n = 1151$) of all participants reported having ever used a face-to-face support group for health, and those living with a chronic disease were significantly more likely ($p < 0.001$) to have used a support group (15.2%) than those without a chronic disease (5.0%). Only 1.5% ($n = 141$) of all participants reported having ever used an OSG for health, and those living with a chronic disease were also significantly more likely ($p = 0.041$) to have used online support (1.8%, $n = 124$) than those without a chronic disease (0.7%, $n = 17$).

Among those living with a chronic disease, the likelihood of using an OSG was significantly higher among those with depression/anxiety (OR = 3.51, 95% CI = 1.70 – 7.24, $p < 0.001$), stroke (OR = 3.03, 95% CI = 1.04 – 8.80, $p = 0.04$), diabetes (OR = 2.96, 95% CI = 1.11 – 7.89, $p = 0.03$), cancer (OR = 2.86, 95% CI = 1.51 – 5.43, $p = 0.001$), or arthritis (OR = 2.52, 95% CI = 1.18 – 5.37, $p = 0.017$). Relative to other chronic diseases, heart conditions, hypertension, lung

Table 1 *Unweighted Characteristics of CHIS-CAM Participants.*

	No chronic illness (n = 2,392) % (n)	Chronic illness (n = 6,795) % (n)	
Gender			***
Female	54.1 (1294)	62.2 (4225)	
Male	45.9 (1098)	37.8 (2570)	
Age			
20–44	65.6 (1569)	25.9 (1759)	***
45–64	29.2 (699)	43.3 (2943)	***
65+	5.1 (123)	30.8 (2093)	***
Race			
White	22.1 (528)	46.1 (3132)	***
Latino	37.8 (904)	20.1 (1363)	***
Asian-American or Pacific Islander	19.6 (469)	12.8 (867)	***
African-American	10.5 (252)	10.4 (709)	<i>n.s.</i>
Others	10.0 (239)	10.7 (724)	<i>n.s.</i>
Primary residence			**
Urban/suburban	83.7 (2001)	77.5 (5261)	
Exurban/rural	16.3 (390)	22.5 (1525)	
Poverty (% FPL)			
0–99%	16.3 (389)	13.6 (924)	**
100–199%	19.9 (477)	21.0 (1426)	<i>n.s.</i>
200–299%	14.4 (345)	14.5 (985)	<i>n.s.</i>
300% and above	49.4 (1181)	50.9 (3460)	*
Education			
Less than high school	21.0 (502)	15.7 (1069)	**
Grade 12 or high school diploma	22.5 (537)	23.8 (1617)	<i>n.s.</i>
Some college	24.8 (594)	28.2 (1917)	<i>n.s.</i>
College graduate or more	31.7 (759)	32.3 (2192)	<i>n.s.</i>
Used CAM in past 12 months (% Yes)	68.4 (1636)	83.0 (5642)	***
Health insurance (% Insured)	77.5 (1848)	88.3 (5992)	***
Used support group for health (% Yes)	5.0 (120)	15.2 (1031)	***
Used online support group for health (% Yes)	0.7 (17)	1.8 (124)	*

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

problems, and back/neck problems were not associated with OSG use (see Figure 1). Those living with asthma were significantly less likely than those with other chronic conditions to have used an OSG (OR = 0.35, 95% CI = 0.13 – 0.95, $p = 0.04$). The association between chronic obstructive pulmonary disease and use of OSGs approached statistical significance (OR = 3.68, 95% CI = 0.96 – 14.1, $p = 0.057$). For comparison, characteristics associated with OSG use in healthy adults are shown in Table 3.

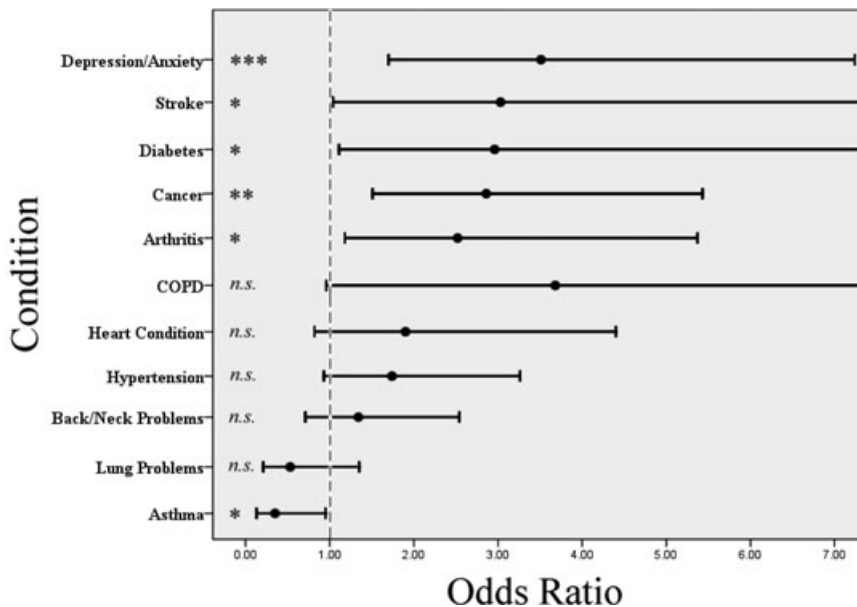


Figure 1 Odds of use of online support groups by those with chronic conditions: adjusted odds ratios from multivariable logistic regression

Note. 95% confidence intervals are provided by error bars; Vertical reference line is provided for OR = 1.00; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; COPD = chronic obstructive pulmonary disease. Odds ratios adjusted for gender, age, race, poverty level, and educational attainment. Reference group for each comparison is those with all other chronic health conditions.

Correlates of Use, Frequency of Use, and Perceived Benefit of Online Support Groups Among Those with a Chronic Condition

Table 2 shows that among those with at least one chronic disease condition, having ever used an OSG was associated with key demographic and health characteristics. Those with at least some college education (OR = 12.2, 95% CI = 1.7, 86.9), income at least 300% above the federal poverty level (OR = 3.1, 95% CI = 1.04 – 9.1), fair or poor self-reported health (OR = 3.1, 95% CI = 1.03 – 9.3), or who had used other complementary and alternative medicine techniques (OR = 5.2, 95% CI = 2.8 – 9.6) were significantly more likely to have used an OSG (see Table 2). Those who were over the age of 65 (OR = 0.19, 95% CI = 0.1 – 0.5) or reported being Latino (OR = 0.2, 95% CI = 0.1 – 0.4) were significantly less likely to have used an OSG. Use of OSGs was not associated with gender, urban/suburban/rural residence, or health insurance status.

For those with a chronic condition who had ever used an OSG, we identified participant characteristics associated with how frequently OSGs were used in the past year. Frequency of OSGs use was regressed onto each of the participant characteristics shown in Table 4 while adjusting for gender, age, ethnicity, income,

Table 2 Participant Characteristics Associated with Use of Online Support Groups Among Those with Any Type of Chronic Illness ($n = 6,795$).

	OR	95% CI
Gender		
Female	1.83	(0.93, 3.60)
Male	1.00	Reference
Age		
18–44	1.00	Reference
45–64	0.74	(0.40, 1.36)
65+	0.19	(0.07, 0.50)***
Race		
White	1.00	Reference
Latino	0.15	(0.05, 0.43)***
Asian-American or Pacific Islander	0.85	(0.40, 1.79)
African-American	0.54	(0.20, 1.48)
Others	0.60	(0.27, 1.34)
Primary residence		
Urban/suburban	0.82	(0.46, 1.46)
Exurban/rural	1.00	Reference
Poverty (% FPL)		
0–99%	1.00	Reference
100–199%	1.30	(0.32, 5.29)
200–299%	3.08	(0.99, 9.64) [†]
300% and above	3.09	(1.04, 9.13)*
Education		
Less than high school	1.00	Reference
Grade 12 or high school diploma	5.91	(0.77, 45.51) [†]
Some college	12.19	(1.71, 86.85)*
College graduate or more	12.23	(1.74, 86.04)*
Insurance		
Insured	1.00	Reference
Not Insured	0.69	(0.26, 1.86)
Self-reported depression or anxiety		
No	1.00	Reference
Yes	3.67	(1.99, 6.80)***
Self-reported health		
Excellent	1.00	Reference
Good or very good	2.06	(0.72, 5.93)
Fair or poor	3.11	(1.03, 9.34)*
Use of other CAM techniques		
No	1.00	Reference
Yes	5.17	(2.80, 9.57)***

Note. [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

CAM = complementary and alternative medicines.

Table 3 Participant Characteristics Associated with Use of Online Support Groups Among Healthy Adults ($n = 2,392$).

	OR	95% CI
Gender		
Female	4.39	(0.8, 23.8) [†]
Male	1.00	Reference
Age		
18–44	1.00	Reference
45–64	0.39	(0.1, 1.4)
65+	0.97	(0.1, 8.4)
Race		
White	1.00	Reference
Latino	0.1	(0.01, 0.7)*
Asian-American or Pacific Islander	0.03	(0.0, 0.3)**
African-American	1.98	(0.4, 8.8)
Others	0.65	(0.1, 3.6)
Primary residence		
Urban/suburban	2.81	(0.7, 10.9)
Exurban/rural	1.00	Reference
Poverty (% FPL)		
0–99%	1.00	Reference
100–199%	23.6	(1.8, 317.4)*
200–299%	3.48	(0.3, 39.0)
300% and above	18.2	(2.2, 153.4)**
Education		
Less than high school	1.00	Reference
Grade 12 or high school diploma	<i>n/a</i>	<i>n/a</i>
Some college	8.51	(0.9, 81.0)
College graduate or more	5.11	(0.6, 47.2)
Insurance		
Insured	1.00	Reference
Not Insured	2.3	(0.4, 11.9)
Self-reported depression or anxiety		
No	1.00	Reference
Yes	<i>n/a</i>	<i>n/a</i>
Self-reported health		
Excellent	1.00	Reference
Good or very good	1.57	(0.3, 8.4)
Fair or poor	<i>n/a</i>	<i>n/a</i>
Use of other CAM techniques		
No	1.00	Reference
Yes	10.5	(2.5, 44.4)***

Note. [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *n/a* = sample size for cell was insufficient for analysis.

CAM = complementary and alternative medicines.

and education. Educational attainment and self-reported health were the only participant characteristics associated with frequency of OSG use in this sample. Compared with college graduates, those who had reached grade 12 or obtained only a high-school diploma used OSGs significantly less frequently. Those reporting fair or poor health reported significantly greater frequency of OSG use relative to those with excellent health.

Among those living with a chronic condition who had used an OSG, we assessed whether these individuals perceived some benefit from their participation in the group. Logistic regression models were used and included gender, age, ethnicity, income, and education as covariates. Age, income and education levels were associated with perceived benefit of OSG use (see Table 5). Relative to the youngest participants, those between the ages of 45 and 64 were significantly less likely to perceive OSGs to be beneficial (OR = 0.1, 95% CI = .02 – .6). Compared with those at least 300% above the federal poverty level, those at the lowest income level were significantly less likely to report having benefited from OSG use (OR < 0.1, 95% CI = .01 – .5). Compared with college graduates, those with less than high-school education were significantly less likely to report having benefited from OSG use (OR < 0.1, 95% CI = .00 – .14). Perceived benefit was not associated with gender, race/ethnicity, rural/urban residence, insurance status, depression/anxiety, or self-reported health. Frequency of OSG use did not differ between those who perceived benefits (\bar{x} = 24.2 days/year) and those who did not (\bar{x} = 14.0 days/year), $t(121) = 0.8, p = .43$.

Distinguishing Between Those with a Chronic Condition who Use Face-to-Face Support and Those who Use Online Support

Among those living with a chronic condition, the prevalence was 16.0% for face-to-face support group use and 1.8% for use of OSGs. A significant association between use of online and face-to-face support groups was observed ($\chi^2(1) = 84.2, p < 0.001$). OSG use was somewhat higher for those who had made use of a face-to-face support group (5.2%). However, among those who reported having used an OSG, the prevalence of face-to-face support group use was 46.0%.

Table 6 identifies participant characteristics stratified by those who had used only a face-to-face support group and those that had used either an OSG or both an OSG and a face-to-face group. Demographic and health characteristics were quite similar for those who had used face-to-face support and those who had used online support. Both groups were predominately female (61.9% for face-to-face support, 68.1% for online support), white (73.1% and 78.5%), resided in urban areas (88.5% and 84.7%), had health insurance (87.8% and 90.4%), and reported either “good” or “very good” health (65.1% and 60.5%). However, those who had used an OSG were significantly younger, $\chi^2(2) = 13.4, p = 0.001$, more likely to report being white than minority, $\chi^2(4) = 12.2, p = 0.016$, had greater educational attainment, $\chi^2(3) = 9.5, p = 0.02$, and had greater CAM use, $\chi^2(2) = 6.6, p = .01$, than those who had used face-to-face support alone (see Table 6).

Table 4 Characteristics Associated with Frequency of Use of Online Support Groups Among Those Living with a Chronic Illness who had Used an Online Support Group After Adjusting for Gender, Age, Race/Ethnicity, Income, and Education.

	Frequency of Use in Past 12 Months	
	Beta	95% CI
Gender		
Female	6.66	(−8.3, 35.6)
Male	Reference	
Age		
18–44	Reference	
45–64	16.3	(−3.3, 35.8)
65+	68.7	(−7.4, 144.7) [†]
Race		
White	Reference	
All Others	−0.4	(−18.9, 18.2)
Primary residence		
Urban/suburban	−22.4	(−56.9, 12.1)
Exurban/rural	Reference	
Poverty (% FPL)		
0–99%	−16.2	(−33.5, 1.1) [†]
100–199%	35.4	(−3.9, 74.7) [†]
200–299%	−8.4	(−31.0, 14.2)
300% and above	Reference	
Education		
Less than high school	−7.7	(−32.6, 17.3)
Grade 12 or high school diploma	−29.6	(−55.0, −4.3) [*]
Some college	−8.4	(−31.0, 14.2)
College graduate or more	Reference	
Insurance		
Insured	Reference	
Not Insured	4.0	(−22.0, 30.0)
Self-reported depression or anxiety		
No	−2.3	(−18.2, 13.7)
Yes	Reference	
Self-reported health		
Excellent	Reference	
Good or very good	19.0	(−5.0, 42.9)
Fair or poor	45.7	(13.7, 77.8) ^{**}
Use of other CAM techniques		
No	Reference	
Yes	−1.9	(−20.5, 16.7)

Note. [†] $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$.

Table 5 Characteristics Associated with Perceived Benefit of Online Support Groups Among Those Living with a Chronic Illness who had Used an Online Support Group After Adjusting for Gender, Age, Race/Ethnicity, Income, and Education.

	Perceived Benefit	
	OR	95% CI
Gender		
Female	2.03	(0.4, 9.7)
Male	Reference	
Age		
18–44	Reference	
45–64	0.1	(0.02, 0.6)**
65+	0.5	(0.03, 9.7)
Race		
White	Reference	
All Others	1.5	(0.3, 8.3)
Primary residence		
Urban/suburban	3.5	(0.7, 18.4)
Exurban/rural	Reference	
Poverty (% FPL)		
0–99%	0.06	(0.01, 0.5)**
100–199%	16.3	(0.97, 273.4)†
200–299%	0.4	(0.07, 2.5)
300% and above	Reference	
Education		
Less than high school	0.00	(0.0, 0.14)**
Grade 12 or high school diploma	1.11	(0.1, 9.4)
Some college	0.9	(0.2, 5.1)
College graduate or more	Reference	
Insurance		
Insured	Reference	
Not Insured	2.2	(0.06, 77.2)
Self-reported depression or anxiety		
No	3.1	(0.8, 12.6)
Yes	Reference	
Self-reported health		
Excellent	Reference	
Good or very good	0.4	(0.03, 6.3)
Fair or poor	0.8	(0.04, 13.8)
Use of other CAM techniques		
No	Reference	
Yes	3.3	(0.7, 16.4)

Note. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 6 Comparison of Weighted Participant Characteristics of Those Living with a Chronic Illness who Reported Using Either Face-to-Face or Online Support Groups.

	FTF Support Only (n = 1,031)	OSG alone or in combination with FTF support (n = 141)	χ^2 (df)	p-value
Gender			0.58 (1)	0.44
Female	61.9%	68.1%		
Male	38.1%	31.9%		
Age			13.40 (2)	0.001
18–44	37.4%	54.8%		
45–64	41.0%	39.1%		
65+	21.6%	6.1%		
Race			12.22 (4)	0.016
White	73.1%	78.5%		
Latino	12.4%	3.6%		
Asian-American or Pacific Islander	5.5%	11.0%		
African-American	6.4%	4.2%		
Others	2.6%	2.7%		
Primary residence			0.95 (1)	0.33
Urban/suburban	88.5%	84.7%		
Exurban/rural	11.5%	15.3%		
Poverty (% FPL)			4.65 (3)	0.20
0–99%	8.8%	4.7%		
100–199%	17.4%	9.4%		
200–299%	13.3%	15.9%		
300% and above	60.4%	70.1%		
Education			9.45 (3)	0.02
Less than high school	7.4%	1.5%		
Grade 12 or high school diploma	23.9%	15.7%		
Some college	31.7%	35.1%		
College graduate or more	37.0%	47.7%		
Insurance			0.31 (1)	0.58
Insured	87.8%	90.4%		
Not Insured	12.2%	9.6%		
Self-reported depression or anxiety			2.59 (1)	0.11
No	68.6%	55.1%		
Yes	31.4%	44.9%		
Self-reported health			1.65 (2)	0.44
Excellent	9.4%	6.2%		
Good or very good	65.1%	60.5%		
Fair or poor	25.5%	33.4%		
Use of other CAM techniques			6.60 (1)	0.01
No	56.7%	34.9%		
Yes	43.4%	65.1%		

Discussion

To our knowledge, this study is the first to examine the population prevalence of OSG use, characteristics associated with OSG use, and differences in OSG use across health conditions. Results suggest that use of OSGs is low among the general population and among those living with a chronic condition. Our overall prevalence estimate of 1.5% is comparable to what has been reported elsewhere (Houston & Allison, 2002; Pew, 2000; Powell & Clarke, 2006). However, those living with some conditions are significantly more likely than those with other conditions to utilize OSGs for health, particularly those with depression/anxiety, stroke, diabetes, cancer, or arthritis. These results suggest that there may be opportunities for healthcare providers to enhance quality of care by expanding the availability of supportive services for these conditions to the Internet. Given our finding that 54% of OSG users have never used F2F health-related support groups, OSGs may represent a way to attain support that is either unavailable or practically inaccessible to them (e.g., due to poor health, time constraints or distance) at the places they receive care. For many, however, use of OSGs appears to be a way to bolster face-to-face services- fully 46% of those who use face-to-face support groups also use OSGs.

Our findings also lend support to the use of the Behavioral Model of Health Services Use for characterizing OSG users. Use of OSGs was associated with a number of predisposing (age, race, CAM use), enabling (income, education), and illness factors (depression/anxiety, health status, having a chronic health condition). Likelihood of using an OSG declined with increasing age but increased with higher levels of income and greater educational attainment. Our hypothesis that those who are underrepresented in face-to-face support groups for health would be more likely to use OSGs was only partially supported. There were no gender differences in use of OSGs or differences by residence (e.g., urban/suburban, rural). However, those with fair or poor health were significantly more likely to use OSG and to use them with greater frequency. Among those living with cancer, the Institute of Medicine has identified impairments in health status as a major barrier to accessing face-to-face support services (Institute of Medicine, 2007). Our current results demonstrate that those with the worst health status use online groups more frequently than those with better health. This is evidence that the Internet may allow empirically-supported adjunct services to reach those who would be unable to access face-to-face services.

There are several notable limitations of the current study. Despite the use of a relatively large, population-based survey for this analysis, the sample size for those who had used OSGs was small, which contributes to large confidence intervals for some subsets of the population. Because of the low prevalence of OSG use among healthy adults, it was not possible to evaluate predictors of perceived benefit or frequency of use of OSGs in this subsample. Additionally, the CHIS-CAM survey was administered in 2003. Because use of the Internet for health-related purposes is evolving rapidly, these data may not reflect current patterns. This study nonetheless fills an important gap in the literature and provides the most up-to-date estimates

yet in the literature for use of OSGs. Future population-level data releases (i.e., from the Health Information National Trends Survey, or HINTS) will make it possible to look at OSG use at a greater level of resolution. For example, it may be possible to determine what specific types of online support services are being used by those with chronic health problems, such as blogs, social-networking sites, or self-monitoring tools.

This study is also among the first to report representative population-based data that provide insight into how individuals with chronic disease make use of, and perhaps choose between, face-to-face and online support groups. Online and face-to-face support group users are not distinct groups. Nearly half of those who had used an OSG had also made use of a face-to-face support group, suggesting that many OSG users seek out these services as a way to supplement services that are already available to them in the community or their healthcare settings. That being said, 54% of OSG users are individuals who have never connected with a face-to-face support group, so there is clearly a subset for whom Internet services are either preferred or more accessible. Relative to those who use face-to-face support services, OSG users are younger, more likely to be White or Asian-American, more educated, and more likely to be CAM users. Understanding patterns in support group utilization could assist community agencies, hospitals, and outpatient treatment facilities in making decisions about how to allocate supportive-care resources to best meet the needs of those who seek these services.

Much work remains to be done. Research on face-to-face support services is plentiful, and empirically-supported face-to-face support services abound for most of the conditions associated with greater likelihood of OSG use: depression/anxiety (Bright, Baker, & Neimeyer, 1999; Dugas et al., 2003), stroke (Kendall et al., *in press*), diabetes (Deakin et al., 2005), cancer (Goodwin et al., 2001; Hoey et al., 2008), and arthritis (Leibing et al., 1999). While OSGs have been evaluated for some of these conditions, nearly all recent innovations in OSGs (e.g., social-networking tools) remain untested for improving quality of life or adjustment to chronic diseases. Finally, although relatively few of those living with a chronic health condition have used OSGs for health, two recent trends suggest that OSG use for health is likely to increase in the near future. First, levels of Internet use are increasing in older adults and are very high among middle-aged adults reaching ages at which chronic health conditions begin to emerge. Second, there are increasing numbers and types of publicly-available, interactive health technologies. Health-related OSGs have the potential to have a considerable impact on the public health, and efforts are needed to overcome disparities in access.

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