

Student Reception, Sources, and Believability of Health-Related Information

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Abstract. Objective: The purpose of this study was to identify the health topics students received information about, how students obtained health-related information, and perceived believability of those sources. **Participants and Methods:** Students ($N = 1202$) were surveyed using the National College Health Assessment (NCHA) of the American College Health Association. **Results:** Nearly half (46%) of the sample reported not receiving any information, whereas only 0.5% received information on all health topics. The Internet was the most common source of health-related information, but, conversely, was perceived as the least believable source. Health center medical staff and university health educators were perceived to be the most believable sources. **Conclusions:** Future practice at the university setting should focus on delivering health information through believable messengers utilizing the most commonly reported sources of information. This may have implications towards how students shape their health-related social cognitions and subsequent behaviors.

Keywords: college health, health education, health message

There is recognition that university and college students are an important target population for health promotion efforts—some have even suggested that their health is an “important and neglected public health problem.”¹ The university or college campus can be seen as a critical setting for health promotion for many of the reasons that schools are. For example, the university is a defined community that may be conducive to the establishment of community norms and policies that promote health, and university students may be particularly receptive to educational programmes.² There is growing diversity in the ethnic and socioeconomic fabric of many universities and a significant proportion of young

adults enter higher education. In 2004, the percentage of the 18- to 21-year-old population enrolled in postsecondary education was 29% in the UK, 32% in Canada, 42% in the United States, and as high as 62% in Korea.³

There is evidence that students do report receiving health information in the university or college setting. One of the first nationally representative surveys in the United States examined the percentage of students reporting having received health information on specific topics from their college or university, with a focus on human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS).⁴ Approximately 78% of students reported receiving prevention information on at least one health topic, and 6% reported receiving information on all health topics (tobacco use, alcohol and drug use, violence, injury and safety, suicide, pregnancy, sexually transmitted diseases [STDs], AIDS/HIV, dietary behaviors, nutrition, and physical activity and fitness). Alcohol and drug use prevention was the most commonly received information (49.2%). Sources of health information were not available for these behaviors (other than AIDS/HIV) and the believability or credibility of these sources was not assessed.

In order to develop effective health promotion interventions, researchers and practitioners can draw upon a knowledge mobilization (KM) perspective⁵ that emphasizes the ability to identify believable messengers and effective channels (methods) for conveying health messages. Simply, do students receive information from the university regarding health behaviors, how do students typically receive information about health behaviors, and is information received through specific channels believable?

Escoffery and colleagues⁶ surveyed 743 students at 2 universities to examine their Internet use and health-seeking behaviors. They found that 74% of the sample received health information from the Internet. More than half of the participants wanted to find health information on the Internet, which led the authors to highlight the potential of the Internet

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as a desired health-promotion channel for college students. To some extent, this mirrors broader findings from nationally representative estimates of health-related uses of the Internet.⁷ Hesse and colleagues⁷ found approximately 64% of the online population has looked for health information for themselves or others in the past 12 months. The caveat is although respondents are turning to the Internet as an information source of first resort, they still report their physicians as being a more-trustworthy source for information than the Internet.

Physical Activity Promotion

Overall, there is little consensus about the health information needs and sources of college students. Although the evidence suggests that many American students do report receiving health information from their institutions, recent evidence also suggests that they increasingly rely on the Internet as a source for health information. These issues, however, have yet to be explored in the Canadian context. Considering there may be cross-cultural and institutional variability in these conclusions, it highlights the need for a focused needs assessment before implementing intervention efforts. To illustrate, an intervention is being developed to increase the physical activity participation of college students at one Canadian university. Physical activity is beneficial for general health outcomes, including all-cause mortality, coronary heart disease, diabetes, some cancers, and psychological well-being,⁸ but also specifically for college student health.⁹ However, levels of physical activity decline across the life span¹⁰—although it is not necessarily linear, with some points showing more drastic decreases than others.¹¹ One particular time period seen to have the most dramatic decline occurs during late adolescence and transition into young adulthood.¹² Growing research attention is now addressing the potential for physical activity promotion within the university setting to alleviate this decline.^{13,14} Notably, fitness and exercise was the most common health topic researched on the Internet by college students,⁶ so understanding how this information could be delivered and framed in an effective and credible manner would be beneficial.

There were 4 objectives of this study. First, we wanted to identify whether students were receiving health information from the university. Second, we wanted to know what topics of information they were receiving. Third, we wanted to determine the sources from where students received health-related information. Fourth, we wanted to determine the perceived believability of those sources. Whereas this information can facilitate broader health promotion efforts at the campus level, the second objective of this study was to apply this collected information to recommend how a physical activity intervention might be developed in a way that matches the interests and preferences of the target audience. Accordingly, we also examined whether there were differences in the variables of interest in terms of gender, marital status, place of residence, and year of study.

METHODS

Design and Sample

Data were collected during the spring of 2006 using the National College Health Assessment (NCHA) of the American College Health Association (ACHA)¹⁵ (for further information, see ACHA¹⁵). The NCHA consists of 58 questions and approximately 300 items primarily assessing student health status and health behaviors, access to health information, impediments to academic performance, and perceived norms across a variety of health areas such as alcohol, tobacco, and other drug use.¹⁵ It has been evaluated extensively for reliability and validity in US college students.¹⁶

Five thousand students (from a student body of approximately 50,000) at the St. George campus at the University of Toronto, Canada,¹⁷ were randomly chosen to receive an invitation by email to participate in the survey. Over a period of 1 month, each potential participant received 3 such invitations to go to a secure Web site, maintained by the ACHA, to complete the ACHA-NCHA Web version of the survey. Participants were also entered into a draw to receive bookstore coupons as an incentive. Study procedures were approved by the University Research Ethics Board.

Measures

Participants provided demographic information, including age, gender, living situation, relationship status, and employment status. In terms of our research objectives, we extracted data for the following 3 questions. First, participants answered questions regarding “*On which of the following health topics have you ever received information from your college or university?*” Responses included health topics such as tobacco use prevention, violence prevention, pregnancy prevention, and physical activity and fitness. Second, participants were asked “. . . to record the believability of each source of health information” (believable, neither believable nor unbelievable, unbelievable) and third, “*Do you usually get health-related information from any of the following sources?*” (no, yes). A complete list of sources is shown in Tables 2 and 3 and included such examples as leaflets, health educators, television, and the Internet.

Analysis

Frequencies were calculated for the demographic characteristics, which were subsequently dichotomized or trichotomized into the following categories: *gender*—male versus female; *residence*—living at home (parental/guardian’s home) versus away from home (college residence, fraternity or sorority, off campus housing); *marital status*—single (not in a relationship) versus other (married, divorced, engaged or in a committed relationship); and *year of study*—first-year undergraduate students versus undergraduate students not in their first year versus graduate students. Frequencies and chi-square tests were used in the analyses to identify prevalence of health-related information being received, sources of health-related information, and believability of these sources, as well as the differences based on demographic variables.

TABLE 1. Demographic Characteristics of Participants (N = 1202)

Characteristics	Sample total		U of T total ¹⁷	
	<i>n</i>	(%)	<i>n</i>	(%)
Gender				
Female	734	61.1%		55.6%
Male	466	38.8%		44.4%
Age				
Undergraduate students	21.77		21	
Graduate students	29.27		27.7	
Student status				
Undergraduate students	789	65.6%		83%
Graduate student	413	34.4%		17%
Full time status	1084	90.2%		89%
Race or ethnicity				—
White, not Hispanic (includes Middle Eastern)	745	62.0%		
Black, not Hispanic	25	2.1%		
Hispanic or Latino	22	1.8%		
Asian or Pacific Islander	372	30.9%		
Native American	6	0.5%		
Other	72	6.0%		
International student status	132	11.0%		9%
Current relationship status				—
Single	605	50.3%		
Other (eg, married, divorced, engaged, committed)	593	49.3%		
Living situation				—
Parents/guardian's home	383	31.9%		
Away from home (eg, residence, off-campus)	814	67.7%		

Note. Values for undergraduate and graduate students' age: (*n*) = median.

Given the sample size, and the large number of comparisons, we set a conservative level of significance at $p < .01$.

RESULTS

The response rate was approximately 24% with 1202 respondents. This is lower than the composite response rate of 35.4% reported in the US survey administration.¹⁵ Table 1 presents the demographic data for the sample in comparison to the demographic breakdown of the university's entire student population. Overall, the sample was broadly representative of the university population in terms of age, full-time status, and international student status. However, there were a greater proportion of responses from graduate students, and females.

Types of Health-Related Information Students Reported Receiving From University

Results indicated that nearly half the university sample (46%) reported not receiving any type of information regarding the identified health topics. Of the 54% of the student population who reported receiving health information, physical activity and fitness (26%) as well as sexual assault prevention (26%) were the 2 most cited topics to have been received. Other commonly reported health topics included sexually transmitted diseases (21%), alcohol and drug pre-

vention (20%), and dietary/nutritional behaviors (17%). The remaining types of health information that students' received from the university are shown in Table 2. Results also revealed a significant gender difference in the types of information topics that students received. Males reported receiving significantly more information on alcohol and drug prevention than females ($\chi^2 = 6.95, p < .01$).

Reported Sources Used for Health-Related Information

The sources of health-related information are indicated in Table 3. Of the 13 health-related sources assessed, the Internet was the most common source (79%) of health-related information. Family and friends also appeared to be influential for university students, with nearly two thirds of the students reporting to have used parents and/or friends to obtain health-related information. In addition, students cited using health center medical staff (56%), magazines (54%), television (53%), health educators (47%), and/or leaflets (46%) as sources for obtaining health-related information. The least used sources for health-related information was resident assistants/advisors (12%) and religious sources (7%).

Results also revealed a number of gender differences in the sources used to obtain health-related information. A higher proportion of females used leaflets ($\chi^2 = 9.90, p < .01$), friends ($\chi^2 = 8.50, p < .01$), and magazines ($\chi^2 = 15.84, p < .01$) as a source for their health-related information

TABLE 2. Types of Information Students Reported Receiving, Ranked by Highest Rates of Prevalence (N = 1202)

Rank	Information type	Total		Females		Males	
		n	%	n	%	n	%
1	Sexual assault/relationship violence prevention	312	26.0	198	27.0	113	24.2
2	Physical activity and fitness	306	25.5	188	25.6	117	25.1
3	Sexually transmitted disease prevention	256	21.3	146	19.9	109	23.4
4	Alcohol and other drug use prevention*	241	20.0	129	17.6	111	23.8
5	AIDS or HIV infection prevention	227	18.9	131	17.8	96	20.6
6	Dietary behaviours and nutrition	199	16.6	130	17.7	68	14.6
7	Tobacco use prevention	186	15.5	102	13.9	84	18.0
8	Pregnancy prevention	162	13.5	111	15.1	50	10.7
9	Violence prevention	137	11.4	90	12.3	47	10.1
10	Injury prevention and safety	109	9.1	68	9.3	41	8.8
11	Suicide prevention	41	3.4	24	3.3	17	3.6
	None of the above	556	46.3	348	47.4	207	44.4

Note. Ranking is based on the total (male and females combined). Due to missing information and rounding of numbers, the percentages may not equal to 100. * $p < .01$; $N_{\text{females}} = 734$; $N_{\text{males}} = 466$.

compared to males. Males, however, reported using residence assistants ($\chi^2 = 7.67, p < .01$) and religious sources ($\chi^2 = 14.83, p < .01$) more than females as a source for their health-related information. It should be noted that although significant differences were found, neither residence assistants nor religious sources appeared to be salient for either gender.

Believability in the Sources of Health-Related Information

In addition to the usage of health-related information, we examined the believability of those 13 sources (see Table 4). The most believable sources of health-related in-

formation were health center medical staff (92%), health educators (90%), faculty/coursework (64%), leaflets (46%), and parents (45%). Meanwhile, the least believable sources of health-related information included magazines (19%), the Internet (17%), friends (17%), television (13%), and religious sources (11%). In the examination of gender differences, only one significant difference emerged. Females perceived health educators ($\chi^2 = 13.03, p < .01$) to be significantly more believable sources of health-related information than males.

Differences in Demographic Variables

Differences in a variety of demographic variables (marital status, place of residence, and year of study) were also

TABLE 3. Reported Sources Health-Related Information, Ranked by Highest Rates of Prevalence (N = 1202)

Rank	Information type	Total		Females		Males	
		n	%	n	%	n	%
1	Internet	974	78.8	587	80.0	360	77.3
2	Parents	789	65.6	486	66.2	301	64.6
3	Friends*	739	61.5	476	64.9	261	56.0
4	Health center medical staff	675	56.2	429	58.4	244	52.4
5	Magazines*	648	53.9	430	58.6	218	46.8
6	Television	631	52.5	383	52.2	247	53.0
7	Health educators	566	47.1	365	49.7	201	43.1
8	Leaflets, pamphlets, flyers*	556	46.3	367	50.0	188	40.3
9	Faculty/coursework	481	40.0	297	40.5	184	39.5
10	Campus newspaper articles	242	20.1	139	18.9	103	22.1
11	Campus peer educators	164	13.6	96	13.1	68	14.6
12	Resident assistants/advisors*	146	12.1	74	10.1	72	15.5
13	Religion*	81	6.7	33	4.5	48	10.3

Note. Ranking is based on the total (male and females combined). Due to missing information and rounding of numbers, the percentages may not equal to 100. * $p < .01$; $N_{\text{females}} = 734$; $N_{\text{males}} = 466$.

TABLE 4. Believability of the Health-Related Information Source, Ranked by Highest Rates of Prevalence (N = 1202)

Rank	Information type	Total		Females		Males	
		n	%	n	%	n	%
1	Health center medical staff	1102	91.7	681	92.8	419	89.9
2	Health educators*	1080	89.9	677	92.2	401	86.1
3	Faculty/coursework	771	64.1	483	65.8	288	61.8
4	Leaflets, pamphlets, flyers	547	45.5	354	48.2	192	41.2
5	Parents	541	45.0	337	45.9	203	43.6
6	Campus peer educators	463	38.5	305	41.6	156	33.5
7	Campus newspaper articles	425	35.4	262	35.7	163	40.0
8	Resident assistants/advisors	352	29.3	223	30.4	128	27.5
9	Magazines	233	19.4	138	18.8	95	20.4
10	Internet	209	17.4	126	17.2	83	17.8
11	Friend	207	17.2	131	17.8	75	16.1
12	Television	157	13.1	84	11.4	73	15.7
13	Religion	137	11.4	73	9.9	64	13.7

Note. Ranking is based on the total (male and females combined). Due to missing information and rounding of numbers, the percentages may not equal to 100. *p < .01; N_{females} = 734; N_{males} = 466.

examined. Most notably, single students and students living away from home were more likely to have reported not receiving any health information ($\chi^2 = 13.14, p < .01$). A number of other differences emerged in the remaining analyses examining the demographic variables and the sources students used for health-related information and the believability of those sources. However, there were no clear trends in these analyses, and as such, are not reported here.

COMMENT

In this study, the reception, sources, and believability of health information were examined among a sample drawn from Canada's largest university. Overall, 46% of the participants surveyed reported not receiving any health-related information, whereas 0.5% of the students received information on all of the health topics identified. This is lower than comparable figures reported in a nationally representative sample of undergraduate students in the United States where approximately 22% of participants did not report receiving any information and 6% reported receiving information on all listed topics.³ Our results indicate that there may be a need for reconsidering how health-related information is disseminated among this student population. This was particularly evident for students who were living away from home, where a significantly greater proportion of those students indicated that they did not receive any information compared to students living at home.

Of the remaining 53.5% of students, the majority of health-related information obtained was related to sexual assault (26%), physical activity and fitness (26%), and prevention of sexually transmitted diseases (21%). Three of the top 5 believable health sources identified were campus based (ie, health campus medical staff, health educators, and faculty/coursework). This finding differs from the US-based sample where only one campus-based health source (ie, medical staff) was identified within the top 5 believable sources.¹⁵ Interestingly, of the 3 campus-based sources perceived to be believable, only 1 (medical staff) was identified within the top 5 frequently used health-related sources. Similar to the US findings,¹⁴ the Internet was reported to be the most frequently used, but one of the least believable, sources for health-related information. Together, these findings indicate a need to establish a synergistic relationship between the health-related sources university students are using to gather information, and the believability of those sources.

Interestingly, a number of gender differences emerged. First, in the examination of health information that students received, males reported receiving more information on alcohol and drug prevention than females. Secondly, a number of differences also emerged around the sources students used to obtain health-related information, and the believability of those sources. Specifically, females reported receiving information from leaflets, friends, and magazines more than

males did, and perceived health educators to be more believable sources of health-related information. Although these differences were not dramatic, they do concur with general findings that men react differently to health care services and health promotion messages in comparison with women.¹⁸ Given that the scope of the health survey was to examine a variety of health-related behaviors, we do not know whether these gender differences would persist for specific types of health behaviors, such as dieting or physical activity. Future research is warranted that explores the gender-related issues regarding the believability and use of sources of specific health-related behaviors.

Implications for Health Educators to Target These Particular Students

One focus of the present study was to explore the believability and use of health information sources within a Canadian university setting so that future physical activity interventions can be developed. Recently, Bray and colleagues¹⁹ conducted the first leaflet-type intervention study to promote physical activity within a sample of first-year Canadian university students. The specifically tailored leaflet intervention was found to partially attenuate the declines in physical activity levels that are typically seen among students transitioning from high school to university,¹⁴ while students reported finding the material within the leaflet credible. However, declines in leisure-time physical activity persisted, leading to questions regarding the overall intervention effect. These modest behavior changes accompanying Bray et al's¹⁹ leaflet intervention may be understood within the context of the current study's findings. Although leaflets were identified within the top 5 believable and useable health-related sources (see Table 4), there may be more effective behavior change methods that can be made available to university students. Some of the traditional methods to disseminate health-related information, such as leaflets, may not be the most believable or preferred source to be used. Consequently, they may not be the most effective for changing physical activity behavior, and speculatively other health behaviors, among university students.

Consistent with previous research,^{6,15,20} the Internet was a prominent health information source, with 79% of participants indicating that they used the Internet to obtain health information. This finding provides further support to Escoffery et al's⁶ claim that the Internet may provide a useful health-promoting channel for university students. Within the university setting, the Internet has been reported to be an acceptable and feasible tool for the treatment of eating disorders,²¹ as well as for raising awareness on smoking cessation.²² Therefore, there is support to suggest the Internet to be an important channel for promoting other health behaviors, such as physical activity, and one that should be addressed in future research. This channel could also feasibly target students living away from home who were more likely to report not receiving any health information at all.

The present findings also highlight the potential benefits of combining frequently used sources with sources that are perceived as “believable”⁶ for effective dissemination of physical activity information among college students. For example, health educators can develop Web-based information and services specific to the population, utilizing established social network tools, such as Facebook or My Space. Faculty members can also play a prominent role in promoting campus-wide physical activity by incorporating physical activity-related information into their existing coursework, which may increase students’ exposure to, as well as their awareness of, physical activity information. Future research should test the effectiveness of combining such believable and usable health sources for enhancing physical activity cognitions and behaviors.

There were several study limitations that should be acknowledged. First, given the high proportion of females and graduate students, the findings may not be representative of the entire university student population. Second, there may be other health-related sources that were not included in the ACHA questionnaire, yet important for university students, such as media personalities or family physicians. It is therefore unknown whether these other health information sources may be more believable and frequently used by our sample. Third, no information was gathered regarding barriers and/or facilitators to obtaining health-related information. Therefore, formative research needs to be conducted to determine potential barriers and facilitators to university students’ use of health information sources. Finally, given the general health focus of the NCHA survey, our findings are limited in their ability to determine the most believable and frequently used sources for specific behaviors, such as physical activity.

Conclusion

Overall, the present study has identified what health topics students had received information about, and from where students get health-related information, and the perceived believability of those sources among Canada’s largest university population. Campus staff, in particular medical staff, health educators, and faculty were perceived as believable sources for health-related information. Meanwhile, the Internet was found to be a ubiquitous health information source, and should be considered, in combination with the campus staff, as channels for health promotion on university and college campuses. Future administrations of the NCHA survey at this university will also allow ongoing evaluation of new strategies to increase the reception of health-related information by its students.

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NOTE

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