

Health Information Sources Accessed by College Females: Differences Between Body-Image Distorted and Non-Body-Image Distorted

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ABSTRACT. This study examined and compared sources of health-related information accessed by female college students with and without body image distortions, and the believability of those sources. Survey data from the American College Health Association, National College Health Assessment were studied retrospectively (N = 27,648). Body image distorted (BID) and non-BID students' most frequent health information sources were parents (76.1% BID; 77.1% non-BID) and internet (70.3% BID; 69.5% non-BID). Believability was greatest for health educators (90.6% BID; 91.1% non-BID) and lowest for television (14.4% BID; 14.5% non-BID). Health intervention strategies for college women should market to

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parents and teach recognition of credible internet sources of health information.

KEYWORDS. Body image distortion, body image, college females, health information, marketing

INTRODUCTION

Disordered eating affects over 10 million females in the United States; the majority being adolescents and young adults (Hoek and van Hoeken 2003). In addition to the immense emotional toll associated with disordered eating, it is well known that chronic disordered eating behaviors may lead to amenorrhea, osteoporosis, tooth decay, or depression (Koutedakis and Jamurtas 2004; Loud et al. 2005; National Eating Disorder Association 2006).

Research indicates over half of female high school students practice weight loss behaviors. For example, 56% of 9th grade females and 57% of 12th grade females exhibited one or more of the following weight loss behaviors: fasting, skipping meals, taking diet pills, vomiting, using laxatives, smoking, or binge eating (Croll et al. 2005). Additionally, disordered eating has been reported to effect 4.5% of college females, of which 8.6% had suicidal thoughts, 21.8% experienced interference with social relationships, 17.4% experienced interference with academic performance, and 16.3%, 10.3%, and 18.6% reported bingeing; purging; and using laxatives, diet pills or diuretics, respectively (Hoerr et al. 2002).

The causes of disordered eating are multiple and complex. Research on female participants has found that disordered eating behaviors such as unhealthy caloric restriction and use of diet pills, may be influenced by women's beauty and fashion magazines (Monro and Huon 2005). Further, the commercial media portrayal of the "ideal" female body often has a negative body image affect on young women (Chow 2004; Fister and Smith 2004; Monro and Huon 2005) and may influence disordered eating. The mechanism by which both may impact disordered eating is through body image distortion (BID). Media may influence BID which in turn may impact disordered eating. Studies indicate that college women with BID (i.e. who perceive themselves to be heavier than they really

are) were more likely to smoke cigarettes, use amphetamines, exercise to lose weight, diet to lose weight, vomit or use laxatives to lose weight, use diet pills to lose weight, and to suffer from bulimia (Moore and Adams, *In Review* 2007; Wharton, Adams and Hampl, *In Press* 2007).

It has been suggested that social marketing may be a useful method of counteracting negative media influences and to provide effective intervention programming (Jack et al. 2005; Kreuter and Wray 2003; Ling et al. 1992). Social marketing is based upon consumer attitudes, beliefs, and needs, aimed at influencing behavior (Weinreich). Thus, identifying the sources of health information most commonly used by young adult females and the degree of believability of these messages has important social marketing implications. Health promotion professionals should deliver information using sources that are both widely accessed and believable among the college female population.

The primary purpose of this paper is to examine the relationship between body image distortion (BID) and sources of health-related information typically accessed (information sources are listed in the methods section below). A secondary purpose is to determine the relationship between BID and the believability of these health information sources.

METHODS

Data from the American College Health Association, National College Health Assessment (NCHA) were studied retrospectively with a cross-sectional design. During the spring 2004 semester 50,819 U.S. college students at 80 schools nationwide completed the NCHA. However, only college females who had been randomly selected or who were in randomly selected classrooms were included in this sample. Thus, the final sample consisted of 27,648, 18–24 year old college females enrolled at 74 institutions. The composite response rate was approximately 35%.

The 74 schools who conformed to the randomized selection of students or classrooms included: 49 public college/universities, 25 private; 67, 4-year, and five 2-year institutions; nine schools with less than 2,500 students, seven schools with 2,500–4,999, 17 schools with 5,000–9,999, 25 schools with between 10,000–19,999 and 16 schools

with 20,000 or more students. Demographic locations of the schools were variable with 13 in the northeast, 18 in the Midwest, 17 in the south, and 24 in the west. Seventeen schools were located in urban areas with populations of greater than 1,000,000, 25 schools located in urban settings between 100,000 and 1,000,000, 10 schools located in suburban settings, and 22 located in rural settings.

The National College Health Assessment (NCHA) was developed by an interdisciplinary team of college health professionals and systematically evaluated with reliability and validity analyses comparing common survey items with national studies such as the National College Health Risk Behavior Survey, conducted by the Centers of Disease Control and Prevention (American College Health Association 2000; Centers for Disease Control 1997). The NCHA has been rigorously evaluated for reliability and validity (American College Health Association 2000). The NCHA includes over 300 items that assess behavioral, medical, normative and demographic characteristics.

The primary dependent variable for this study, "information sources", was a dichotomous question: "Do you usually get health-related information from any of the following sources?" Students answered "yes" or "no" to the following sources: leaflets, pamphlets, flyers; campus newspaper articles; health center medical staff; health educators; friends; resident assistants/advisors; parents; religious center; television; magazines; campus peer educators; faculty/coursework; internet/world wide web; other (please specify). A secondary dependent variable was a measure of the believability of the sources identified above. Students indicated if the sources were "believable", "neither believable nor unbelievable", or "unbelievable".

The independent variable was a dichotomous measure of body image distortion (BID). BID was created by comparing of a self-description of weight to actual body mass index (BMI) category. For example, students who described themselves as overweight, but had normal or underweight BMI were considered to have body image distortion (BID). These subjects were compared to students who gave a description of their weight that matched their BMI category. For example, if students described their weight as "about the right weight" and had normal BMI, or if they reported they were overweight and had a BMI between 30–34.9 or reported they were underweight and their BMI was < 18.5 , they were defined as non-BID.

There may have been campus differences in completion rate, care with which questions were answered, or the inclination to falsify information.

Therefore, several steps were taken to protect validity. First, an omission criterion where the value corresponding to the mean plus four standard deviations was used for the following continuous variables: hours of alcohol consumed at last party (greater than 14 hours), number of drinks consumed at last party (greater than 22), and number of sexual partners in past 12 months (greater than 13). Responses beyond four standard deviations from the mean on any of these variables were considered outliers, and were therefore omitted ($n = 583$ males and females omitted from initial sample). Second, consistent with NIH weight guidelines, BMI values reported below 15 and ≥ 45 were also omitted ($n = 290$ males and females from initial sample). Finally, male and female participants under 18 ($n = 2$) and 25 or older ($n = 3,749$) were also omitted from the initial sample. The final sample consisted of 27,648, 18–24 year old female college students.

ANALYSIS

Descriptive analyses were used to determine the percentage of subjects who reported getting health-related information from the information sources listed in the survey (sources provided below in Results section), and the percentage of subjects who believed, neither believed nor didn't believe, or did not believe the particular source of health information. Cross-tabulation analysis was used for the nominal variable "information sources" and ordinal variable "believability" with Cramer's V and Somers' D employed as estimates of effect size, respectively. All statistical analyses were computed using SPSS 11 statistical software for Apple computers. Results were considered significant if the $p < .05$.

RESULTS

Demographic information is provided in Table 1. Frequency of all health information sources in the survey was included by BID or non-BID group (see Table 2). Descriptive results revealed that both BID and non-BID college females most frequent health information sources were parents (76.1% BID; 77.1% non-BID) and the internet (70.3% BID; 69.5% non-BID). The least frequently used information source by both groups was religious center (8.9% BID; 10.2%

TABLE 1. Demographic Characteristics

Grade Point Average (GPA)	Frequencies; Valid Percentage
A	10,348; 38.1%
B	13,602; 50.0%
C	2,778; 10.2%
D/F	149; .5%
Age	
18	3,414; 12.4%
19	5,655; 20.6%
20	5,019; 18.2%
21	4,502; 16.4%
22	2,642; 9.6%
23	1,270; 4.6%
24	5,001; 18.2%
Year in School	
1st year undergraduate	6,481; 24.1%
2nd year undergraduate	5,887; 21.9%
3rd year undergraduate	5,631; 20.9%
4th year undergraduate	4,549; 16.9%
5th year or more	4,390; 16.3%
Current Relationship	
Single	14,123; 51.3%
Married	2,357; 8.6%
Engaged	10,672; 38.8%
Sep/div/wid	356; 1.3%
Currently Live	
Residence Hall	10,062; 36.6%
Sorority	405; 1.5%
Other University housing	1,391; 5.1%
Off Campus	10,356; 37.6%
With Parents	3,713; 13.5%
Other	1,594; 5.8%
Sorority	
Yes	2,252; 8.2%
No	25,248; 91.8%
Hours Worked Weekly	
0 Hours	9,963; 36.3%
1–9 Hours	4,724; 17.2%
10–19 Hours	5,968; 21.7%
20–29 Hours	3,703; 13.5%
30–39 Hours	1,452; 5.3%
40 Hours	958; 3.5%
More than 40 Hours	697; 2.5%

(Continued)

TABLE 1. Continued

Grade Point Average (GPA)	Frequencies; Valid Percentage
Hours Volunteered Weekly	
0 Hours	16,719; 61.0%
1–9 Hours	9,455; 34.5%
More than 10 Hours	1,215; 4.4%
Race	
Caucasian	19,989; 72.7%
Black	1,677; 6.1%
Hispanic	1,187; 4.3%
Asian	2,714; 9.9%
Native American	94; 0.3%
Other	1,829; 6.7%

non-BID). The believability of information sources was greatest for health educators (90.6% BID; 91.1% non-BID) and lowest for television (14.4% BID; 14.5% non-BID) for both BID and non-BID groups. Believability frequencies are provided in Table 3.

Inferential statistics revealed differences between information sources chosen by BID compared to non-BID college females. Those

TABLE 2. Health Information Sources

Sources	Body Image Distorted (BID) %	Normal Body Image (Normal) %
Leaflets, pamphlets, flyers	60.1	60.7
Campus newspaper articles	28.8	27.5
Health center medical staff	61.7	61.5
Health educators	51.5	52.8
Friends	66.6	65.5
Resident assistants/advisors	15.4	14.2 ²
Parents	76.1	77.1
Religious center	8.9	10.2 ²
Television	50.5	48.0 ²
Magazines	62.9	60.5 ²
Campus peer educators	17.6	16.6
Faculty/coursework	36.6	38.3 ²
Internet/world wide web	70.3	69.5

¹Percentages reflect those that “usually get” information from each source.

²Significantly different at $p < .05$.

TABLE 3. Believability of Health Information Sources

Sources	Body Image Distorted (BID) %	Non Body Image Distorted (non-BID) %
Leaflets, pamphlets, flyers	65.8	67.8 ²
Campus newspaper articles	46.6	46.3
Health center medical staff	89.5	90.4 ²
Health educators	90.6	91.1
Friends	25.2	25.0
Resident assistants/advisors	35.7	35.1
Parents	66.5	68.6 ²
Religious center	26.1	28.7 ²
Television	14.4	14.5
Magazines	25.0	25.1
Campus peer educators	45.3	46.5
Faculty/coursework	65.8	65.8
Internet/world wide web	22.6	22.6

¹Percentages reflect those that believe information from each source.

²Significantly different at $p < .05$.

with BID were more likely to use information sources from assistants/advisors, television, and magazines ($p < .05$; Cramer's V values .014, .020, .020, respectively). BID subjects were less likely to access information from religious centers and faculty/coursework sources ($p < .05$; Cramer's V $-.018$ and $-.014$, respectively) compared to non-BID subjects. Significant differences in the believability of information sources between the BID and non-BID groups demonstrated that the BID group was less likely to believe information from the leaflets/pamphlets/fliers, health center/medical staff, parents, and religious center information sources ($p < .05$; Somer's D .017, .018, .019, .031 respectively) compared to the non-BID group.

Parents were the most popular source of health information and were considered highly believable by college females. The internet was the second most popular source for seeking health information, however the believability of the internet was relatively low (22%). Health center medical staff and faculty scored high on believability (BID 89.5%; non-BID 90.4% and BID 65.8%; non-BID 65.8 respectively), however subjects were less likely to access these sources, especially faculty, as a source of health information (health center = BID 61.7%; non-BID 61.5% and faculty = BID 36.6%; non-BID 38.3%).

TABLE 4. Clinics Scheduling more than One OEF/OIF Appointment

Clinic Specialty	Total Pending Appointments	Less than 30 Days	30 to 90 Days	90 to 120 Days	Compliance (%)
Allergy Immunology	5	5			100
Audiology	5	5			100
Cardiology	6	6			100
Dental	24	24			100
Dermatology	21	18	3		86
Ear, Nose, & Throat	9	8	1		89
Gastroenterology	12	12			100
General Internal Medicine	5	5			100
General Surgery	2	2			100
Gynecology	5	4	1		80
Hand Surgery	2	2			100
Mental Health	76	74	2		97
Neurology	21	21			100
Neurosurgery	8	8			100
Oncology/Tumor	2	2			100
Optometry	18	9	1	1	50
Orthopedics	19	18	1		95
Physical Therapy	10	5	4		50
Plastic Surgery	2	2			100
PM & RS	2	2			100
Podiatry	19	19			100
Primary Care	144	137	6		95
PTSD Clinic Team	22	22			100
Pulmonary/Chest	25	19	6		76
Rheumatology/Athritis	4	4			100
Substance Abuse	10	10			100
Urology	10	9	1		90
Women's Clinic	15	13	2		87
TOTAL	503	465	28	1	92

DISCUSSION AND CONCLUSIONS

Parents were identified as the most commonly used source of health information with relatively high believability among female college students in both the BID and non-BID groups. These results suggest that health promotion efforts targeting the parents of college-age females might be an overlooked strategy. Females have been found to be especially influenced by their mothers. Parents have also been found to be potential sources of sociocultural pressures. For example, research has found that mothers of girls who demonstrate

bulimic symptoms and body dissatisfaction have been more critical of their daughter's weight and attractiveness compared to mothers who were less critical (McCabe and Ricciardelli 2005). Considering these factors in combination with the high percent of college females who access parents as a source for health information, health promotion efforts that educate the parents of college females may hold promise as a future intervention.

The second most frequently accessed source of information was the internet. However, the believability of the internet as a health information source was the second lowest (BID and non-BID groups 22.6%) among the health information sources studied. One might speculate that college women have learned not to trust the internet. However, much credible health information is available; consumers just need to learn how to recognize it. For example, students and their parents could be taught how to recognize credible health information on websites accredited by HON (Health on the Net Foundation) or URAC (Utilization Review Accreditation Commission).

The most highly believable sources of health information identified in this study included health educators (BID 90.5%; non-BID 91.1%), medical center staff (BID 89.5%; non-BID 90.4%), parents (BID 66.5%; non-BID 68.5%), faculty/coursework (BID 65.8%; non-BID 65.8%), and leaflets/pamphlets/flyers (BID 65.8%; non-BID 67.8%). Health educators, medical center staff, and leaflets/pamphlets/flyers were likely to be accessed (BID 51.5% and non-BID 52.8%; BID 61.7% and non-BID 61.5%; BID 60.1% and non-BID 60.7% respectively), however the likelihood of accessing faculty for health information was relatively low (BID 36.6%; non-BID 38.3%). The results of this study do not suggest why faculty were not likely to be used as sources of information. However, an intervention strategy might focus on enhancing the approachability and accessibility of faculty to students.

Results of this study were especially intriguing considering the large sample size and the broad demographic representation of the college female population. In particular, the descriptive statistics of such a large and diverse sample would provide a view of where US college women are generally likely to access health information and what sources of health information they are likely to believe. Identifying primary sources of health information accessed by college females and the believability of those sources may potentially

impact the success and effectiveness of health information delivery efforts and social marketing campaigns. Health promotion professionals might use knowledge of highly accessed and believable health information sources to plan intervention programs. For example, information provided to parents may be likely to be shared with female college students. Also, parents, health educators, health center medical staff, and authors of leaflets/pamphlets/flyers might help direct students to credible internet sources of health information.

A limitation of this study was the self-reported data. However, the NCHA has been previously validated (American College Health Association 2000). Other researchers have also validated self-report for health related conditions in the college population (Cohen et al. 1995). Another limitation was the small effect sizes, indicating statistical differences between groups were not strong. Statistical significance may have occurred due to the large sample size, leaving the possibility that college females with BID and non-BID conditions may not be different regarding health information sources and believability of those sources. Additionally, even though the groups were significantly different ($p < .05$) regarding accessing some sources of health information (resident assistants/advisors, television, magazines, religious centers, and faculty/coursework), these differences may not be large enough to justify different health promotion strategies among groups. Despite limitations of the study, the large sample of college females participating in the survey provided an opportunity to describe this population's use of health information sources and the believability of those sources. Identifying sources of health information that will reach and be believed by college females is an important step in creating effective intervention and prevention programs.

In conclusion, the results of this study suggest three main intervention strategies for health promotion professionals to consider. First, body image distortion intervention and prevention strategies for college women should involve parents. Second, the data support health promotion efforts to teach college women, their parents, health educators, medical center staff, and faculty how to critique credibility of internet sources. Finally, it may serve the interest of female college students to increase approachability and accessibility of faculty with health education backgrounds and of health center medical staff.

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