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Informational Support And Online Information Seeking: Examining The Association Between Factors Contributing To Healthy Eating Behavior.

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Informational social support and online health information seeking: Examining the association between factors contributing to healthy eating behavior

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ABSTRACT

This study explores the nature of the relationship between informational social support and components of online health information seeking and how this process influences college students' healthy eating intentions. Results showed that social support was positively associated with online information seeking and more favorable impressions of nutrition/healthy diet information on the web. In addition, although social support was not associated with healthy eating intentions, all three information-seeking measures significantly predicted this outcome – even after controlling for numerous health-related factors. Additional mediation tests showed that social support had an indirect impact on healthy eating intentions through use as well as through a multi-step process involving perceptions of online resources. Overall, these results suggest that by raising health consciousness, informational support may trigger online health information seeking leading to healthier lifestyle intentions.

1. Introduction

Public health concern over the U.S. obesity epidemic has stimulated research addressing information resources that may facilitate healthier lifestyle decisions. Although the public has access to a tremendous amount of health information via both mediated and interpersonal channels (Lewis et al., 2012), it is less clear how specific resources uniquely contribute to healthy eating habits and whether these distinct information channels operate together to predict these outcomes.

Of the various information resources accessible to the public, the Internet has become a particularly attractive venue for gaining knowledge on various health concerns. Research shows that more than 60% of adults report having sought out health information online (Fox & Jones, 2009). Consequently, researchers must continue to explore factors that motivate people to seek online health information as well as whether increased use of online resources results in better health decisions. This study seeks to investigate a process through which social support and online health information seeking operate together to impact healthy eating behavior. First, this study examines how diet and weight-focused informational social support predicts online information seeking and more favorable perceptions of online nutrition/healthy diet websites. Second, building on prior research exploring the indirect impact of social support on health outcomes, this study examines whether online information seeking mediates the relationship between informational support and healthy eating intentions. Overall, this study offers further insight into the relationship between different informational health resources as well as the importance of information seeking in healthier lifestyle decisions.

2. Online information seeking and health

Information seeking is defined by Johnson (1997) as the "purposive acquisition of information from selected information carriers" (p. 26). While physicians, family members, and traditional forms of mass media (e.g., television, radio) are useful outlets to obtain health information (Napoli, 2001), the Internet has also become an appealing resource to obtain health information. The web offers numerous advantages for those seeking health information, including anonymity/privacy, the ability to find information tailored to the user's needs, and the potential for interactivity and social support (Barker, 2008; Berger, Wagner, & Baker, 2005; Cline & Haynes, 2001; Drentea & Moren-Cross, 2005; Lambert & Loiselle, 2007). Based on these characteristics, it is not surprising that 74% of

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college students reported ever using the Internet to acquire health information and more than 40% indicated that they had frequently searched the web for this information (Escoffery et al., 2005).

For numerous reasons, it is crucial to examine what drives college students to seek out online nutrition and diet information. First, the prevalence of obesity in the U.S. remains high, with more than one-third of the adult population obese (Ogden, Carroll, Kit, & Flegal, 2012). Another rationale for investigating students' motivation to search online for nutrition and diet information is that obesity is linked to a variety of serious long-term health problems including cancer, type 2 diabetes, coronary heart disease, and stroke (Centers for Disease Control, 2012). Consequently, the Internet may be a valuable resource for college students as they seek to prevent serious obesity-related health problems in the future.

Importantly, among young adults, substantial increases in weight occur between the ages of 18 and 29 (Mokdad et al., 2003). While obesity rates are lower among college students than adults overall, recent data shows that the prevalence of overweight and obesity among this group has increased from 27.4% in 2006 to 29.2% in 2011 (American College Health Association, 2012). Overall, the college years mark a key transitional time frame for health behavior (Harris, Gordon-Larson, Chantala, & Udry, 2006). Thus, the web may play an important role in providing students with helpful information that buffers the possible negative influence other environmental factors have on college student's weight.

3. Social support and information seeking

Social support refers to the ways in which people interpret information, affective comfort, and general assistance (through actions and words) offered by others (Segrin & Domschke, 2011; Wallston, Alagna, DeVellis, & DeVellis, 1983). Ultimately, social support is a reflection of the relational transactions occurring between people (Zimet, Dahlem, Zimet, & Farley, 1988). This involves an interpersonal exchange whereby the provider of social support assists the recipient in managing the challenges and uncertainty associated with a given situation (Albrecht & Goldsmith, 2003).

Social support has important implications for healthy lifestyle decisions. In particular, one's network of family and friends serve as a crucial resource for gaining health knowledge (Dutta-Bergman, 2004). In addition, social support has often been studied for its relationship with people's dietary habits (e.g., Chlebowy & Garvin, 2006; Gallant & Dorn, 2001; McKinley, 2009; Thornton et al., 2006). Research has found that diet and weight-focused *informational* support – the type of support examined in this study – has been found to correlate with healthy eating behavior (McKinley; Thornton et al.) as well as lower BMI scores (Herzer, Zeller, Rausch, & Modi, 2011).

Although this research shows that social support contributes to health knowledge and eating behavior, based on prior research it is unclear what relationship exists between support and diet-specific health information seeking among college students, as well as the possible significance of this association for healthy lifestyle decisions. To address how support may be associated with health information seeking, two alternative perspectives are examined.

3.1. Compensation perspective

Case (2007) posits that information seeking reflects a "response to a need or gap in your knowledge" (p. 5). Expanding on this argument, recent research (Han et al., 2010; Shaw et al., 2008) suggests that information seeking may be triggered by the desire to fulfill psychosocial needs. Based on assumptions drawn from the comprehensive model of information seeking (CMIS; Johnson & Meischke, 1993), some researchers have noted that because online health information satisfies psychosocial needs, it can compensate for social support deficits (Han et al.).

Unfortunately, the uniqueness of prior studies and the inconsistencies in findings make it challenging to assume a negative relationship between support and online nutrition/healthy diet information seeking. In particular, the majority of prior research examining this relationship assessed the information-seeking behavior of those being treated for breast cancer (Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2002; Han et al., 2010; Shaw et al.). Two studies involving online breast cancer information seeking from one specific source supports this hypothesis (Han et al.; Shaw et al.). Conversely, another study exploring support as an outcome measure and assessing online breast cancer information seeking through use of *any* Internet site found a significant, positive relationship between these health resources (Fogel et al., 2002). In addition, to further complicate comparisons, studies indicating a negative association employed one particular support measure tailored to cancer patients (Han et al.; Shaw et al.), whereas others utilized a broader and more extensive support scale (Fogel et al., Percheski & Hargittai, 2011). Overall, these inconsistent results suggest that the nature of the relationship between social support and online health information seeking remains relatively unclear. Thus, an alternative perspective must be explored to assess whether and how student's level of support triggers health information seeking.

3.2. Health consciousness perspective

While not directly addressing social support, assumptions drawn from the health consciousness literature (MacInnis, Moorman, & Jaworski, 1991; Park & Mittal, 1985) offer a competing perspective on the relationship between interpersonal assistance and health information seeking. The health consciousness perspective argues that through interpersonal communication with close others, individuals will become more conscious of making healthier lifestyle decisions. Specifically, as others share more health knowledge, the individual is likely to become more involved in her health and more motivated to engage in healthier actions. Consequently, those who are more health conscious will engage in healthier activities, including health information seeking (Dutta-Bergman, 2005a; Moorman & Matulich, 1993). Research testing this hypothesis showed that increased interpersonal communication both directly predicted higher levels of health information seeking and indirectly predicted this outcome through healthier eating behavior (Dutta-Bergman). To the authors' knowledge, only one study has addressed the relationship between social support and online health information seeking among college students (Percheski & Hargittai, 2011). In that study, results showed that there was a non-significant, positive association between support and information seeking. The authors noted that the results were consistent with previous data supporting how adults use online health information to complement existing/traditional health resources (Neustadtl & Robinson, 2002; Tian & Robinson, 2008).

In sum, there are two competing arguments involving the relationship between informational support and online nutrition/healthy diet information seeking. The compensation perspective stipulates that information seeking is the result of specific information needs left unfilled by interpersonal resources. Alternatively, drawing from the health consciousness literature, a competing perspective is that through the receipt of more information from others, individuals will become health conscious, resulting in more proactive information-seeking behavior. This leads to the following research question:

RQ1: What is the relationship between informational social support and online nutrition/healthy diet information seeking?

3.3. The relationship between social support and perceptions of online health information

College students' attitudes toward online health information may contribute to more consistent use of this resource. Specifically, prior research indicates that users' perception of the utility of an information channel is strongly associated with information-seeking action (DeLorme, Huh, & Reid, 2011; Johnson & Meischke, 1993; Kahlor & Mackert, 2009). While some prior research has examined how perception of the value of interpersonal health resources predicts perceived utility of other information channels (Rains, 2007), there is a lack of theoretical as well as empirical research examining whether a specific relationship exists between social support and perceptions of online informational resources. Thus, there is no clear reason why the support one receives from others affects that individual's perception of other sources of information. One possible explanation may be that a lack of support increases the perceived value of other information resources. Although not directly identifying social support, the CMIS (Johnson & Meischke, 1993) argues that health-related factors (e.g., beliefs, self-efficacy) trigger certain information needs. Social support may be perceived as a key psychosocial health-related factor that, when lacking, increases the value of other information channels. It follows then that if students lack a clear form of assistance such as social support, they may perceive other media sources (such as the web) as being more helpful. Unfortunately, there is little prior research that has examined a link between health-related factors and perceptions of a medium and among the studies that have addressed such associations, weak or non-significant associations have been found (DeLorme et al., 2011; Johnson & Meischke, 1993). An alternative argument could be drawn from a health consciousness perspective. In particular, while beliefs and/or attitudes have not specifically been studied in this literature, a more nuanced assessment of health consciousness could suggest that greater informational support stimulates increased involvement/interest in health topics that fosters more positive perceptions of other information channels. Overall, it remains unclear what relationship, if any, exists between social support and perceptions of online health resources. This leads to the following research question:

RQ2: Is social support from important others associated with the perceived helpfulness of online nutrition/healthy diet information?

3.4. Social support and online information seeking as predictors of healthy eating intentions

The previous sections offer alternative explanations for how social support drives information seeking behavior and perceptions of online health resources; however, the impact of this relationship on healthy lifestyle intentions remains unexplored. Importantly, communication researchers continue to examine various processes through which social support impacts health behavior (Segrin & Domschke, 2011). Prior investigations have found that different psychosocial factors (e.g., loneliness, self-efficacy) mediate the relationship between support and health outcomes (Duncan & McAuley, 1993; McKinley, 2009; Segrin & Domschke, 2011). To the authors' knowledge, there is a lack of research examining whether health information seeking intervenes in this process. Although most research involving online health information-seeking focuses exclusively on factors predicting use (e.g., Han et al., 2010; Percheski & Hargittai, 2011; Rains, 2007), recent studies indicate that people report online health information searches having a positive impact on their health behaviors (Liszka, Steyer, & Hueston, 2006; Rice, 2006; Warner & Procaccino, 2004, 2007). Thus, the final research question explores whether social support indirectly predicts healthy eating intentions through online health information seeking:

RQ3: Does online health information seeking mediate the relationship between informational social support and healthy eating intentions?

While social support from important others and the web offer information and assistance that may motivate healthy eating intentions, there is no clear rationale for why perceived helpfulness of online nutrition/healthy diet information would *directly* predict healthy eating intentions. Rather, perceptions of the helpfulness of online nutrition/healthy diet information may indirectly associate with healthy eating intentions through increased information seeking. The CMIS predicts a causal process whereby more favorable perceptions of a medium shape information-seeking action (Johnson & Meischke, 1993). As opposed to the inconsistency in findings involving the relationship between social support and information seeking, a more established association has been found between perceptions of a medium and information-seeking behavior (DeLorme et al., 2011; Johnson & Meischke, 1993). Consequently, perceptions of a medium should lead to increased levels of information seeking that, in turn, predicts healthy eating intentions. Therefore, the following conditional hypothesis, predicated on nutrition/healthy diet information seeking from the web being directly associated with healthy eating intentions, is posed:

H1. Online nutrition/healthy diet information seeking will mediate the relationship between perceived helpfulness of online nutrition/healthy diet information and healthy eating intentions.

4. Method

4.1. Participants

A total of 297 undergraduate men and women in communication courses participated in this study. College students were recruited through the CRTNET listserv, a popular resource for academics in the communication discipline. Through the listserv, instructors were asked to disseminate the survey to their undergraduate students. Eighteen students were removed from subsequent analyses because they either did not indicate an age, or the age given was above the desired range for this population. The remaining 279 participants ranged in age from 18 to 29, with a mean age of 20.52 ($SD = 2.05$). Women comprised 73% of the sample and men 27%. White participants reflected 65.9% of the sample, 19.3% included Latinos and Asian-Americans, and 14.8% represented Blacks, Mixed-Race, and other/unknown. Given the small number of participants ($n < 40$) in all categories except white, for analysis purposes, all respondents were grouped into either a white or non-white category.

4.2. Questionnaire

Students completed an online survey that included the central variables in this study as well as a variety of control measures that have been found to correlate with online health information seeking (Johnson & Meischke, 1993; Rains, 2007) and/or healthy eating behavior (Cox, Koster, & Russell, 2004; Hayes & Ross, 1987; Shroff & Thompson, 2004; Umeh, 2003). While certain control measures have not previously been tested directly as

predictors of information seeking, given that the current study assessed links between health information resources providing nutrition/healthy diet information and the overall implications of such relationships for healthy eating intentions, for both practical and exploratory reasons, it was necessary to include these variables.

4.3. Control measures[1]

4.3.1. Body mass index

Respondents were given a body mass index chart and asked to locate the range of BMI scores that their weight fell under. The four BMI ranges included: less than 18.5 (underweight) 18.5–24.9 (normal weight), 25–29.9 (overweight), and 30–36 (obese). Roughly 62% (61.6%) of participants fell within the normal weight range as indicated by BMI score.

4.3.2. Appearance concerns

An index previously used by Hayes and Ross (1987) was employed to assess appearance concerns. The questions were measured on a 1–5 scale from 1 (not at all important) to 5 (very important). Appearance concern items were averaged in creating an appearance concern scale (M = 4.29, SD = .78, α = .90).

4.3.3. Response efficacy

Response-efficacy was assessed through two five-item scales, with items adopted from Umeh (2003) and Plotnikoff and Higginbotham (1995). Responses for these items were measured on a 1 (strongly disagree) to 5 (strongly agree) scale. One response efficacy scale asked about the efficacy of avoiding fatty foods on lowering health risks and maintaining a healthy weight (M = 4.18, SD = .81, α = .87), and another response efficacy scale assessed how effective fruits and vegetables were for lowering health risks and maintaining a healthy weight (M = 4.13, SD = .77, α = .88).

4.3.4. Self-efficacy

An abbreviated 8-item version of Sheeshka, Woolcott, and MacKinnon's (1993) eating self-efficacy scale examined one's ability to eat fruit and vegetables and restrict his or her fat intake. Responses for these items were measured on a 1 (not at all agree) to 5 (strongly agree) scale. All eight items were summed together, then averaged to create an eating self-efficacy scale (M = 3.26, SD = .88, α = .84).

4.3.5. Perceived vulnerability

Perceived vulnerability for becoming obese was measured by two items modified from a vulnerability scale employed by Cox et al. (2004). The items assessed one's perceived personal risk of becoming obese as well as a comparative risk assessment with those in one's age group. Items were measured from 1 (extremely low) to 5 (extremely high). The average of these items together formed a perceived vulnerability scale (M = 2.07, SD = 1.00, α = .88).

4.3.6. Barriers

Barriers to healthy eating were assessed through five items derived from Sheeshka et al. (1993). Each item was measured on a 1 (strongly disagree) to 5 (strongly agree) scale. The average of these five items together formed a barriers to healthy eating scale (M = 3.06, SD = .87, α = .75).

4.3.7. Current eating behavior

Current healthy eating behavior was assessed through a seven-item scale created by Sheeshka et al. (1993). Items were measured on a 1 (never) to 5 (always) scale. The items were summed together then averaged to create the current eating behavior scale (M = 3.14, SD = .68, α = .67).

4.4. Central study variables

4.4.1. Informational social support

To measure informational social support, a modified version of the informational support sub-scale of Reider's (2007) Weight Management Support Inventory (WMSI) was used.[2] The response options for this three-item measure were as follows: 1 = never, 2 = one or two times a month, 3 = one time per week, 4 = several times per week, and 5 = daily. An example item is: "Others tell me about the foods that I could try that are low in fat and calories." The average of these three items together formed an informational support scale (α = 73). On average, participants reported receiving informational support below the scale mid-point, (M = 1.94, SD = .80) or slightly less than one or two times a month.

4.4.2. Web information seeking

Three different measures adapted from prior research were used to measure online nutrition/healthy diet information seeking (Rains, 2007; Turner, Rimal, Morrison, & Kim, 2006). The first measure assessed frequency of searching for nutrition/healthy diet information on the Internet. The options were as follows: 1 (never), 2 (one or two times a month), 3 (one time per week) 4 (several times per week) and 5 (daily). The second measure asked how many websites participants visited in a typical week that contained nutrition and diet information from 0 (none) to 6 (more than five). Finally, participants were asked the average time they spent on a website that contained nutrition/healthy diet information, ranging from: 1 (no time/does not apply), 2 (less than 1 min), 3 (1–10 min) 4 (11–20 min), and 5 (more than 20 min). Frequency of online search (M = 2.21, SD = 1.07), # of websites visited per week (M = 1.29, SD = 1.51), and amount of time spent on website (M = 2.49, SD = 1.17) all fell below their respective scale midpoint. Although the three items were highly correlated (all Pearson r values were greater than .65), because each addressed different aspects of information seeking behavior, the authors opted to treat them as separate variables. Overall, by treating these variables as separate measures, this allowed for a more nuanced investigation of the relationship between information seeking and both social support and healthy eating intentions.

4.4.3. Perceived helpfulness

To examine users perception of the utility of online nutrition/healthy diet information, participants were asked one question regarding how helpful they believed nutrition and healthy diet information was that they found on the Internet [from 1 (not helpful/does not apply) to 5 (extremely helpful)]. Although reliability issues are significant concerns when employing single-item measures in quantitative studies, given the goal of assessing the information value (i.e. helpfulness) afforded specifically to online nutrition/healthy diet websites, the single-item approach – used previously to address the utility of online health information for specific health issues (e.g., DeLorme et al., 2011; Rains, 2007) – was selected over multi-item scales addressing broader attitudes toward this medium. The question was adapted from prior research examining perceived utility of online health information

[1] Example items for appearance concerns, current eating behavior, and health belief measures are available upon request.

[2] Items from the original scale that pertained strictly to exercise behavior were excluded from this study.

(DeLorme et al.; Rains). Participants perceptions of the helpfulness of online nutrition/healthy diet information fell right around the scale-midpoint ($M = 2.99$, $SD = 1.01$).

4.4.4. Healthy eating intentions

Finally, healthy eating intentions were assessed through a five-item scale measuring future healthy eating behavior (Sheeshka et al., 1993). Items were measured on a 1 (highly unlikely) to 7 (highly likely) scale. The scale included items such as: "Over the next few weeks, I intend to eat some vegetable at dinner." All items were summed together and averaged to create a healthy eating intentions scale ($\alpha = .86$). Average future healthy eating intentions ($M = 4.47$, $SD = 1.51$) was above the scale mid-point

5. Results

5.1. Social support and information seeking

Research questions 1 and 2 examined whether social support predicted online information seeking and perceived helpfulness of online resources. The results of a series of preliminary simple Pearson correlation analyses indicated that informational social support was *positively* associated with frequency of online search ($r = .17$, $p < .01$) and # of websites visited ($r = .19$, $p < .01$), but not with time spent on websites ($r = .10$, $p > .05$). In addition, informational support was positively associated with perceived helpfulness ($r = .14$, $p < .05$). Follow-up hierarchical regression analysis was performed to assess the unique contribution of informational support on these information-seeking variables after the inclusion of control variables in the model (see Table 1). In the three hierarchical regression models predicting online nutrition/healthy diet information seeking, informational support remained a significant, positive predictor of frequency of online search ($\beta = .14$, $t = 2.25$, $p < .05$) and # of websites visited ($\beta = .16$, $t = 2.52$, $p < .05$), in both hierarchical regression models. It is important to note that frequency of online search and time spent on websites are ordinal-level variables. For most analyses, few differences emerged when employing either ordinal or interval-level tests. Thus, for purposes of clarity and consistency, the findings reported reflect the treatment of these variables as internal-level measures. However, parallel ordinal-level tests were run to confirm numerous findings. For tests involving informational support as a predictor of frequency of online search, no meaningful differences were found when employing either ordinal regression or hierarchical linear regression. However, when examining time spent on websites, initial ordinal regression tests showed that the model violated the test of parallel lines assumption (slope coefficients being equivalent across response categories). Interestingly, follow-up multinomial logistic regression with 'no time spent on site' as the reference group indicated that informational social support was significantly associated with a 1.89 (95% CI = 1.12–3.20) increase in the odds of spending less than 'one minute' on the Internet for diet/nutrition information, as well as a 1.69 (95% CI = 1.09–2.63) increase in the odds of spending 'one through ten minutes' on the Internet for diet/nutrition information. What this suggests is that informational social support is positively associated with *brief* but not *extended* time spent on diet/nutrition website. Overall, the findings across the different information seeking measures strongly support the health consciousness perspective and not the compensation perspective.

The second analysis involved perceived helpfulness as the criterion variable. The inclusion of informational support in model 2 explained significant incremental variance in this measure, $\Delta R^2 = .02$, $F(1, 232) = 3.90$, $p = .05$. Informational support was a significant, positive predictor of perceived helpfulness of online nutrition/healthy diet information ($\beta = .13$, $t = 1.97$, $p = .05$) even after controlling for all other known predictors of this variable.[3]

5.2. Mediation analyses

To examine research question 3 and hypothesis 1 that involved the mediating role of online health information seeking, bootstrapping analysis (Preacher & Hayes, 2008) tested through AMOS 22 software was performed. These analyses are used to formally assess whether an indirect effect (i.e., information seeking mediates the relationship between informational social support and perceived helpfulness of online health information) is statistically significant. Given that informational social support was not significantly associated with time spent on websites in a clear incremental fashion (informational support only predicted brief time spent on sites), for these particular analyses, only frequency of online search and # of websites visited were assessed as potential mediating variables. As noted above, given the little differences found when examining frequency of online search or time spent on website as ordinal or interval-level measures, these variables were treated as interval-level mediators for all subsequent investigations.

5.2.1. Informational social support and healthy eating intentions

Research question 3 examined whether online health information seeking mediated the relationship between informational social support and healthy eating intentions. Preliminary Pearson correlation tests showed that frequency of online search: ($r = .36$, $p < .01$)[4] and # of websites visited: ($r = .29$, $p < .01$) were significantly associated with healthy eating intentions. However, contrary to previous research, informational social support was not significantly associated with this outcome ($r = .03$, $p > .05$). As noted by Hayes (2009) and Kenny (2011), most current analysts agree that the essential requirements for mediation include proving that the independent variable (i.e. informational social support) is associated with the mediator and that the mediator predicts the outcome measure. Ultimately, if the mediator is associated with the outcome, then a path from the independent variable to the outcome may be implied, and thus, should be investigated through bootstrapping techniques. Results of bootstrapping analysis showed that the indirect relationship between informational social support and healthy eating intentions through frequency of online search ($\beta = .08$, $p < .01$) and # of websites visited ($\beta = .07$, $p < .01$) was statistically significant (see Figs. 1 and 2). These results indicate a significant indirect effect of informational support on healthy eating intentions through online health information seeking.

5.2.2. Perceived helpfulness and healthy eating intentions

Hypothesis 1 predicted that online health information seeking would mediate the relationship between perceived helpfulness and healthy eating intentions. Preliminary Pearson correlation analyses showed perceived helpfulness was significantly associated with all three information seeking measures (frequency of online search: $r = .52$, $p < .01$, # of websites visited: $r = .48$, $p < .01$, time spent on websites: $r = .52$, $p < .01$),[5] as well as healthy

[3] Because this particular study draws from theoretical perspectives (i.e., CMIS), arguing that information seeking is an outcome of source perception (i.e., perceived helpfulness), we did not include information seeking as an additional predictor of perceived helpfulness in the hierarchical regression model. However, post hoc analyses showed that when the information seeking measures were included in these regression models, social support was no longer a significant predictor of perceived helpfulness.

[4] For the ordinal correlational analysis involving the relationship between frequency of online search and healthy eating intentions similar results were found: $r_s = .35$, $p < .01$.

[5] For the ordinal-level information seeking measures (frequency of online search, time spent on site), similar significant correlations were found (frequency of online search: $r_s = .52$, $p < .01$, time spent on site: $r_s = .50$, $p < .01$).

Table 1
Summary of hierarchical regression analyses for variables predicting online nutrition/healthy diet information-seeking measures.

	Frequency of online search		# Of websites visited		Time spent on website	
	β	SE	β	SE	β	SE
Model 1 – Control measures						
BMI	−.04	.11	−.01	.15	−.02	.12
Gender (male)	−.05	.16	−.09	.23	−.13*	.18
Perceived vulnerability	.06	.08	.09	.12	−.001	.09
Barriers	.15*	.08	.06	.11	.11†	.09
Self-efficacy	.27**	.10	.24**	.15	.17†	.11
Rsp. efficacy (fat)	−.10	.10	−.12	.15	−.03	.11
Rsp. efficacy (fruits/veg.)	.11	.11	.07	.16	.05	.12
Appearance concerns	.04	.09	−.02	.13	−.05	.10
Current eating behavior	.11	.13	.12	.19	.20*	.14
	$R^2 = .15$**		$R^2 = .12$**		$R^2 = .14$**	
Model 2 – Predictors						
Informational support	.14*	.08	.17**	.12	.07	.09
	$\Delta R^2 = .02$*		$\Delta R^2 = .03$**		$\Delta R^2 = .004$	

Note: Regression coefficients are standardized.
† $p < .10$.
* $p < .05$.
** $p < .01$.

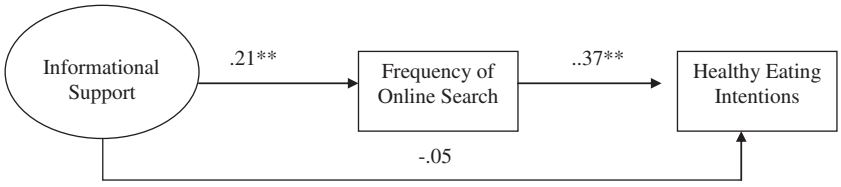


Fig. 1. Frequency of web search as mediator between informational support and healthy eating intentions. *Notes*: The numbers reflect standardized regression coefficients. **$p < .01$. Informational support was assessed as a latent measure comprised of three indicators. Path coefficients (β) were greater than .65 ($p < .01$) for all three indicators.

eating intentions ($r = .25$, $p < .01$). Results of bootstrapping analyses showed that the indirect relationship between perceived helpfulness and healthy eating intentions through frequency of online search ($\beta = .17$, $p < .01$), # of websites visited ($\beta = .11$, $p < .01$), and time spent on website ($\beta = .14$, $p < .01$) was statistically significant (see Figs. 3–5). In tests involving frequency of online search as the mediator, perceived helpfulness was no longer a significant predictor of healthy eating intentions, indicating full mediation (see Fig. 3).

Follow-up hierarchical regression analyses were performed to examine the full contribution of informational social support, information-seeking, and perceived helpfulness of online health resources on healthy eating intentions after controlling for other known predictors of this outcome. Given the high correlation found between the online information-seeking measures, it was necessary to run three separate hierarchical regression models to avoid multicollinearity. In all three models, the online nutrition/healthy diet information-seeking measure emerged as the only significant or marginally significant predictor of healthy eating intentions (see Table 2).[6]

[6] Findings from preliminary parametric ($r = .33$, $p < .01$) and nonparametric correlation tests ($r_s = .32$, $p < .01$) involving the relationship between time spent on website and healthy eating intentions yielded roughly equivalent results. Furthermore, a one-way ANOVA test including a post hoc Scheffe test determined that mean healthy eating intentions were significantly higher across each time category compared to spending no time seeking online nutrition/healthy diet information. Based on these findings, it was deemed appropriate to treat time spent on website as an interval measure for the regression analyses.

5.3. Post hoc analyses

5.3.1. Current health behavior

While not a focus of this study, it is important to address whether specific elements of health consciousness mediate the relationship between informational social support and information seeking. Current healthy eating behavior is one critical component of health consciousness theorized to mediate this relationship. In particular, health communication researchers posit that health consciousness is reflected in the health practices of the individual and that healthy eating behavior is a critical aspect of health consciousness (Dutta & Youn, 1999; Dutta-Bergman, 2005a). Surprisingly, results of a Pearson correlation analysis indicated that current healthy eating behavior was *not* associated with informational support ($r = .02$, $p > .05$). Overall, this component of health consciousness did not mediate the relationship between informational support and online information seeking.

5.3.2. Exploring a comprehensive model

Although there lacks a theoretical foundation to explain an indirect association between informational support and information seeking, to explore a more comprehensive link between the central study variables, a final series of mediation analyses involving perceptions of online resources were performed. Post-hoc results showed a significant indirect effect of informational support on frequency of online search ($\beta = .08$, $p < .05$) and number of websites visited ($\beta = .08$, $p < .05$) through perceived helpfulness. Furthermore, results indicated that perceived helpfulness fully mediated the relationship between support and frequency of online search ($\beta = .12$, $p > .05$), while partially mediating the association between support and number of websites visited ($\beta = .15$, $p < .05$). Because

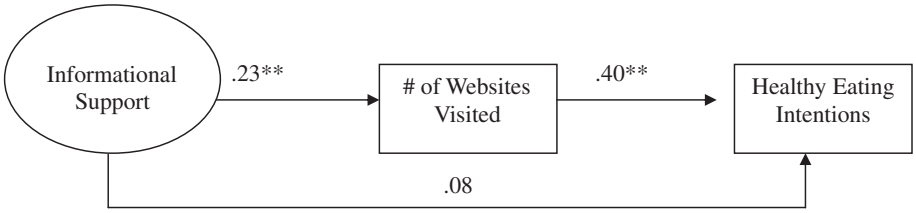


Fig. 2. Frequency of web search as mediator between informational support and healthy eating intentions. *Notes*: The numbers reflect standardized regression coefficients. $^{**}p < .01$. Informational support was assessed as a latent measure comprised of three indicators. Path coefficients (β) were greater than .65 ($p < .01$) for all three indicators.

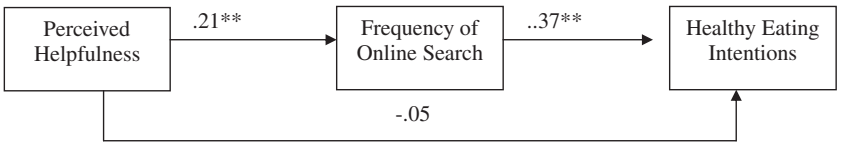


Fig. 3. Frequency of web search as mediator between informational support and healthy eating intentions. *Note*: The numbers reflect standardized regression coefficients. $^{**}p < .01$.

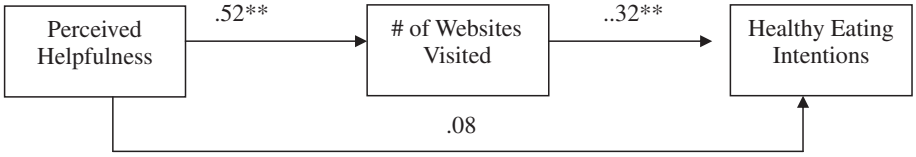


Fig. 4. Frequency of web search as mediator between informational support and healthy eating intentions. *Note*: The numbers reflect standardized regression coefficients. $^{**}p < .01$.

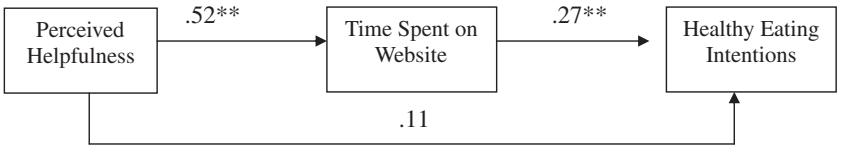


Fig. 5. Time spent on website as mediator between perceived helpfulness and healthy eating intentions. *Note*: The numbers reflect standardized regression coefficients. $^{*}p < .05$, $^{**}p < .01$.

only the analysis involving frequency of online search showed full mediation (indicating a more parsimonious process), a subsequent structural equation model was tested to explore this particular process (see Fig. 6). These findings indicate a clear three-step process leading from informational support to healthy eating intentions [χ^2 (9) = 10.97, $p > .05$, CFI = .99, RMSEA = .03, TLI = .99, SRMR = .04).

6. Discussion

The goal of this study was to examine the association between diet and weight-focused informational support and online information seeking, and subsequently, the impact of this association on college students' healthy eating intentions. The findings from this study support the health consciousness perspective, whereby informational social support motivates greater information seeking from other resources (such as the Internet). These results suggest that in response to more informational support received from others, health-oriented students may seek out the web for additional diet/nutrition information.

In addition, subsequent tests indicated that informational social support had no direct association with healthy eating intentions, but rather, indirectly predicted this outcome through online health information seeking. Thus, in addition to psychosocial factors, health information seeking may be a key intervening mechanism that explains how social support contributes to healthier behaviors. Finally, although not explored in previous health consciousness literature, post hoc tests showed evidence of an indirect link between informational support and online information seeking through perceived helpfulness of online channels. Building on these findings, tests of a structural model supported a comprehensive three-step process resulting in healthy eating intentions.

6.1. Implications for research involving college students' health

This research offers some explanation of what drives college students to search online for nutrition and diet information. The results indicate that among students, motivation to seek out online nutrition/healthy diet information is positively associated with informational social support. Given the rising obesity rates among this population (American College Health Association, 2012), those with high concern about eating healthily (i.e., health conscious consumers) may use multiple resources that provide different forms of assistance. In support of this argument, closer inspection of the descriptive data indicates that average levels of informational social support were consistent with frequency of online search (roughly 1–2 times per month). This implies that the amount of informational support pertaining to weight-related concerns college students receive parallels the frequency they seek out online nutrition/healthy diet information.

Table 2
Summary of hierarchical regression analyses for variables predicting healthy eating intentions.

	β	SE	R^2	ΔR^2
Model 1 – Control measures			.52**	
BMI	.07	.12		
Gender (Male)	−.09	.18		
Perceived vulnerability	−.04	.09		
Barriers	−.12**	.08		
Self-efficacy	.30**	.11		
Rsp. efficacy (fat)	.01	.11		
Rsp. efficacy (fruits/veg.)	.08	.12		
Appearance concerns	.11*	.10		
Current eating behavior	.37**	.14		
Model 2a – Predictors				.02*
Informational support	.001	.09		
Perceived helpfulness	<.001	.08		
Frequency of online search	.16**	.08		
Model 2b – Predictors				.01
Informational support	.003	.09		
Perceived helpfulness	.03	.08		
# Of websites visited	.10†	.06		
Model 2c – Predictors				.02†
Informational support	.01	.09		
Perceived helpfulness	.02	.08		
Time spent on websites	.12*	.07		

Note: Regression coefficients are standardized.
† $p < .10$.
* $p < .05$.
** $p < .01$.

These findings also provide a clearer understanding of how students attempt to manage diet and nutrition concerns. In particular, web information seeking – not informational social support – significantly predicted healthy eating intentions. Thus, when examining healthy eating behavior among this group, information provided through various websites may carry significant weight in determining students' dietary choices. This may be linked to the impressions college students have of online health resources. In particular, post hoc mediation analyses suggest that informational support leads to both more favorable impressions of the helpfulness of online nutrition/healthy diet information that in turn triggers increased online health information seeking. Furthermore, participants in this study found online nutrition/healthy diet information at least moderately helpful (roughly at the scale midpoint). This is consistent with recent data which showed that 37% of college students believed that the health information they found on the Internet in at least some manner improved the way they took care of their health (Escoffery et al., 2005). Overall, when college students perceive online health resources as being more helpful, they may be more likely continue to use these resources as guides for healthier lifestyle decisions.

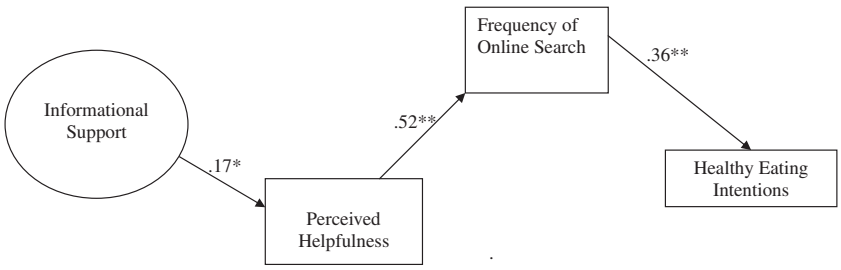
6.2. Theoretical implications

6.2.1. Assessing social support and information seeking

There are different explanations for why the results from this study differ from prior information-seeking research. One rationale is that this study focused solely on one type of social support – informational support – and its association with informational needs. The two studies that supported the compensation perspective (Han et al., Shaw et al.) assessed the association between a global measure of social support and use of an interactive online resource (comprehensive health enhancement support system). Most likely, participants used this interactive resource to satisfy various emotional, esteem, and informational needs. Therefore, it is possible that specific online health resources, such as interactive websites, compensate for social support deficits when people are seeking other psychosocial needs (e.g., emotional support, esteem support). Conversely, more general online health information searches may result from an increased health orientation initially triggered by informational social support.

In addition, the use of a global measure of online information seeking in this study rather than measuring usage of a particular health website may have obscured more specific information needs. For example, users may go to a particular diet or cancer-related website when they fail to receive more nuanced information from close friends and family. Therefore, it is possible that a lack of informational social support does lead to more online health information seeking when the individual has a more targeted question or concern.

Beyond the methodological distinctions made between this study and previous research, different theoretical rationales may address why the health consciousness perspective was supported. First, while we did not directly measure participants' nutritional concerns, it is possible that those students who are more nutrition/diet conscious receive more informational support and also seek out greater online healthy diet information. Essentially, similar to arguments posed to explain the use of complementary media sources (Dutta-Bergman, 2004), students with a strong interest in nutrition and diet may rely on multiple information resources to satisfy these particular information needs. In addition, a review of information seeking/behavior models provides insight into how individuals use multiple health resources. Specifically, Wilson's (1997) general model of information behavior posits that people may perform 'ongoing' information searches when attempting to verify or expand on information obtained from other resources. Based on this argument, when receiving informational



χ^2 (9) = 10.97, $p > .05$, CFI = .99, RMSEA = .03, TLI = .99, SRMR = .04
** = p < .01, * = p < .05

Fig. 6. Results of post hoc structural model examining the effect of informational support on perceptions of online sources, frequency of online search, and healthy eating intentions. *Note*: Informational Support was assessed as a latent measure comprised of three indicators. Path coefficients (β) were greater than .65 ($p < .01$) for all three indicators.

support pertaining to nutrition and/or diet, college students may turn to the web to double-check the validity of the information obtained by supportive others and/or gather additional knowledge.

6.3. Limitations and areas for future research

There are several study limitations that hopefully will lead to future investigations exploring this issue. First, because this research assessed healthy dietary behavior, it remains unclear whether similar findings would be found when examining other health issues. Thus, future researchers should test the association between informational social support and online health information seeking across a range of health topics that are of concern for college students (e.g., sexual health, depression, drug abuse, anxiety).

Second, while the use of an online listserv likely increased the national representativeness of the student sample, the fact that the instrument was completed online may have influenced the findings. More specifically, although recent studies show that online health information seeking is common among college students (Escoffery et al., 2005), the data collection process may have inadvertently been catered toward those with more favorable attitudes toward online resources.

Third, this study did not address what types of content/formats college students seek out on the web. Consequently, it is unclear whether students are more apt to search for strictly informational content concerning nutrition/healthy dietary practices or sites that provide more interactive services (e.g., blogs, discussion forums). It would be helpful for future researchers to more thoroughly examine the content and format of nutrition websites to assess what aspects of these sites students find most valuable and unique from other health resources.

Fourth, future researchers should re-examine the relationship between the central study variables among other groups. In particular, factors such as education and income have been linked to health information seeking (Ramanadhan & Viswanath, 2006). Furthermore, while Internet access has become fairly widespread in the U.S., research shows that college students may seek out health information online more frequently than other adult populations (Escoffery et al., 2005; Fox & Jones, 2009). Thus, those with less Internet access may be impacted more by the social support received from important others. In contrast, certain at-risk groups for obesity and obesity-related health problems may turn to the web more frequently than college students, and thus, benefit more from the nutrition/healthy diet information provided on these sites.

Fifth, follow-up investigations are also needed to isolate components of health consciousness that mediate the relationship between informational social support and online health information seeking. As noted in the post hoc analyses, current healthy eating behavior – a component of health consciousness – did not mediate the relationship between social support and online health information seeking. However, it is likely that other attitudinal or cognitive components of health consciousness/health orientation that reflect broader motivations or interests in health matters (see Dutta-Bergman, 2005b) are critical intervening factors. In addition, the second series of post hoc tests showed that perceptions of online resources mediated the relationship between informational support and online health information seeking. Unfortunately, current health consciousness literature does not provide substantial insight into how perceptions regarding health resources are influenced by support. Incorporating other health consciousness components into a larger model may offer a clearer understanding of these associations.

Finally, this study employed a cross-sectional survey design. Therefore, the mediation analyses do not provide evidence of causal relationships between these variables. Although manipulating the nature or degree of exposure to supportive messages could compromise the ecological validity of an investigation, this type of experimental approach is needed to determine a temporal process whereby social support influences information seeking and indirectly affects specific health outcomes. More thorough investigations may also wish to explore whether support precedes both perceptions and use of online health resources. As noted above, there lacks any theoretical explanation for why social support influences perceptions toward certain information channels as well as whether these beliefs mediate the relationship between support and use of complementary resources. It is conceivable that after receiving social support, and subsequently becoming more health conscious, students may *immediately* seek out other information sources. Information seeking may then influence one's perception of the different information channels. Furthermore, it is probable that a reciprocal relationship exists between these factors that offers support for both the compensation and health consciousness perspectives. In particular, young adults may initially lack social support that motivates online health information seeking. Through increased online health information seeking, young adults may encounter virtual support groups that offer additional informational assistance. Consequently, a longitudinal assessment that tracks one's level of social support and health information seeking across a significant time period would offer insight into the relationship between these factors.

7. Conclusion

The goal of this study was to explore the nature of the relationship between informational social support and components of online health information seeking and how this process influences college students' healthy eating intentions. Results showed that social support was positively associated with online information seeking and more favorable impressions of nutrition/healthy diet information on the web. Subsequent tests explored whether online information seeking mediated the relationship between informational social support and healthy eating intentions. Results showed that informational support had an indirect impact on healthy eating intentions through online health information seeking as well as through a multi-step process involving perceptions of online resources. Overall, these results suggest that by raising students' level of health consciousness, informational social support may trigger online health information seeking that in turn fosters healthier lifestyle decisions.

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