

## Losing weight on the Web? A content analysis of dieting- related Web sites

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*Overweight people often hesitate to consult health professionals in person: they opt to surf the Web for solutions to weight loss instead. Despite the numerous diet and dieting-related sites offering a wide range of information, few content analysis studies have been conducted on such sites. This study aims to conduct a formal analysis of diet and dieting-related sites by employing the widely suggested criteria of evaluating online health information.*

In a culture of increasing interest in health information online, health and medicine has become the fourth most popular subject of users online, only behind news, travel, and weather.<sup>1</sup> Due to the prevalence of health and medical related Web sites (more than 20,000 Web sites<sup>2</sup>), not only health professionals but also lay people have access to a great deal of health information.

While the availability of immediate access to health information has been of great value to healthcare professionals and patients, the high probability of inaccuracy in online medical information can be a threat to public health. A content analysis study, that reviewed more than 1600 medical information queries appearing on an online discussion group,

ing the quality of Internet health information: credibility, content, disclosure, links, design, interactivity, and caveats.<sup>4</sup> Huizingh<sup>5</sup> focused on two important characteristics of Web sites – content and design. He suggests that Web site content is comprised of commercial and non-commercial information, transaction-related features, and entertainment. Design features of Web sites are classified as navigation structure, multimedia capabilities and presentation style.

People who use dieting-related Web sites to search for weight-loss tips can benefit from many kinds of helpful diet information but may be simultaneously threatened by fraudulent information on some sites. Overweight people often hesitate to consult health professionals in per-

been conducted on such sites. This study aims to conduct a formal analysis of diet and dieting-related sites by employing the widely suggested criteria of evaluating online health information.

The research questions asked in this study are:

**RQ1** *What content does diet and dieting-related Web sites provide to users?*

**RQ2** *Are there compositional differences among diet and dieting-related Web site categories?*

### Methods

#### Sampling

The most readily available means of attaining a comprehensive listing of diet and dieting-related sites is to use a search engine. By employing the advanced search function at Google, a total of 890 available diet-related sites were found. Out of these 890 sites, 242 remained as valid for the diet Web site content analysis. To capture the original data in real time, a 'spider' (offline browser) program was used to save entire sites and store them at the point of capture in a remote data file.<sup>6</sup> Of the 242 sites, 151 were randomly sampled through a rigorous sampling procedure.

The Health Information Technology Institute of Mitretek Systems developed seven major criteria for assessing the quality of Internet health information: **credibility, content, disclosure, links, design, interactivity, and caveats.**<sup>4</sup>

found approximately 90% of the medical messages (answers) provided were authored by people who did not have any formal medical training.<sup>3</sup>

The Health Information Technology Institute of Mitretek Systems developed seven major criteria for assess-

son: they opt to surf the Web for solutions to weight loss instead. In fact, weightwatchers.com alone has an estimated 2.3 million unique visitors per month. Despite the numerous diet and dieting-related sites offering a wide range of information, few content analysis studies have

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## Variables

In order to differentiate dieting-related Web sites by design and content critically, this study categorised these sites into three groups: information sites, infomercial sites, and commercial sites.

1. 'Information sites', like dietcoach.com, provide solely diet-related information and do not commercially offer information or opportunities like online shopping or merchandising. They claim the materials on their sites are for informational purposes only.
2. 'Infomercial sites' provide extensive information and intend to persuade dieters to purchase their brand of diet programme or products (i.e. books, software, etc.) from the site. These sites,

such as dietcoaches.com, generally provide their own brand of support materials that people

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3. 'Commercial sites', like zoneperfect.com, provide online shopping opportunities for many different brands of diet products such as diet pills and diet supplements. Often, these sites provide little information about the products sold nor a plan to implement their use.

After reviewing the 'about us' or 'mission statement' of each of the sampled

151 sites, they were put into one of the three categories: 37 information, 66 infomercial, and 48 commercial.

For each site, coders initially recorded basic information, i.e. URL, page title, and date coded. The variables for 'commercial information' fell into the following categories: copyright, personal testimonial, logo, statement of confidentiality, executive profile, and banner ads. The next section was about 'commercial transactions'. Coders noted if the site contained an online store/shopping and shipping. For the following 'non-commercial information' section, coders checked whether each site

**Table 1** Presence of 'commercial information', 'commercial transaction', 'non-commercial information', and 'interactive' items at dieting Web sites

	Information (n = 37)	Infomercial (n = 66)	Commercial (n = 48)	Total (n = 151)
<b>Commercial information</b>				
Copyright	78.4	80.3	72.9	<b>77.5</b>
Personal testimonial	29.7	71.2	33.3	<b>49.0</b>
Logo	37.8	47.0	35.4	<b>41.1</b>
Statement of confidentiality	32.4	37.9	39.6	<b>37.1</b>
Executive profile	27.0	43.9	27.1	<b>34.4</b>
Banner ads	51.4	18.2	31.3	<b>33.3</b>
<b>Commercial transaction</b>				
Online store/shopping	0.0	95.5	97.9	<b>72.8</b>
Shipping	0.0	69.7	91.7	<b>59.6</b>
Product category				
Food (including supplement)	13.5	81.8	33.3	<b>49.7</b>
Pills	8.1	22.7	68.8	<b>33.8</b>
Products (CDs, diet programme)	5.4	34.8	31.3	<b>23.2</b>
<b>Non-commercial information</b>				
Common diet information	81.1	43.9	39.6	<b>51.7</b>
Supportive materials	54.1	37.9	25.0	<b>37.7</b>
Recipés	43.2	34.8	8.3	<b>28.5</b>
Calories/BMI calculator	21.6	18.2	31.3	<b>23.2</b>
<b>Interactivity items</b>				
Submit a question	73.0	93.9	95.8	<b>89.4</b>
Subscription/register	45.9	87.9	72.9	<b>72.8</b>
Contact info listed	54.1	84.8	58.3	<b>68.9</b>
Q&A	45.9	74.2	70.8	<b>66.2</b>
Online community	32.4	28.2	14.6	<b>25.2</b>
Survey	2.7	13.6	8.3	<b>9.3</b>
Navigation bar	9.1	8.5	10.0	<b>9.2</b>
Chat room	10.8	9.1	4.2	<b>7.9</b>

Values are given as percentages.

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contained common diet information, supportive materials, recipes, and a calories/body mass index (BMI) calculator. The presence of submit question, subscription/register, contact information, Q&A, online community, survey, navigation bar, and chat

of these sites, regardless of categorical classification, have their own copyright (77.5%) items. To enhance credibility, more than a third of diet sites employ logos (41.1%), statements of confidentiality/privacy (37.1%), and executive profile (34.4%). Banner ads

As expected, non-commercial, informational items are popular on the information sites. Information sites have more common diet information (81.1%) and supportive materials (54.1%) than the other two types of site. However, commercial sites have more calories/BMI calculator items (31.3%) than information sites (21.6%).

Huizingh<sup>5</sup> suggests that Web site content is comprised of commercial and non-commercial information, transaction-related features, and entertainment; and design features of Web sites are classified as navigation structure, multimedia capabilities and presentation style.

room were checked to identify interactive functions.

### Coders and reliability

Three graduate students coded the sites. The ranges of inter-coder reliability estimates of the 32 variables were acceptable ( $0.74 \leq \text{Scott } \pi \leq 1.0$ ).

## Results

### RQ1 – What content does diet and dieting-related Web sites provide to users?

The first research question concerned identifying main items that are present on the dieting Web sites according to the pre-defined categories. The

are more common at the information sites (51.4%) than the other two categories (Table 1).

Testimonials from satisfied customers positively enhance perceptions of advertising effectiveness.<sup>7</sup> The presence of personal testimonials is higher in infomercial sites (71.2%) than information sites (29.7%). In terms of the executive profile, half of the infomercial sites include them (43.9%), presumably because they want to convince consumers that their products and programmes are reliable. Information sites employ more banner ads (51.4%), presumably because they do not make profits by selling products (merchandising).

Infomercial sites possess more interactive items, like submit question, subscription, contact info, Q&A, and survey features. The 'submit a question' feature overwhelmingly exists in all the categories of sites (89.4%). Almost two-third of these sites have subscription/register and contact information features which are more popular in the infomercial and commercial sites than information sites. A third of information (32.4%) and infomercial (28.2%) sites have online community functions that enable patrons to share diet information, but this function is low in the commercial sites. Even though a chat room is necessary for a dietitian to share diet plans (in real-time), the presence of such an option is very low across all sites. Several items developed for ease of navigation such as a sitemap (16.6%), a search function (14.6), and language translation (2.6%) are in exploratory stages throughout the sites.

While the availability of immediate access to health information has been of great value to healthcare professionals and patients, the high probability of inaccuracy in online medical information can be a threat to public health

results indicate that the infomercial category (43.7%) is the leading major form of diet and dieting-related Web site followed by the commercial category (31.8%) and the information category (24.5%).

Commercial information items are present on the Web sites; more than half

Common commercial transaction items are, quite understandably, online store(s) (72.8%) and shipping (59.6%). Diet foods are the main merchandise in infomercial sites (81.8%). On the other hand, diet pills are more popular in the commercial sites (68.8%) when compared to the other categories.

### RQ2 – Are there compositional differences among diet and dieting-related Web site categories?

Table 2 shows the results of median differences of four indices among three specified diet and dieting-related Web site categories. The evidence suggests that categorical differences exist in their composition. Commercial information items ( $\chi^2 = 23.94$ ,  $df = 2$ ,

**Table 2** Differences between item indices among three categories of dieting Web sites

Index	Mean rank			Chi-square	P-value
	Information	Infomercial	Commercial		
Commercial information	62.51	95.13	60.09	23.94	$P < 0.001$
Commercial transaction	21.46	90.27	98.42	84.28	$P < 0.001$
Non-commercial information	101.96	75.66	56.46	24.66	$P < 0.001$
Interactivity items	50.42	93.84	71.19	25.77	$P < 0.001$

Because the level of measurement is ordinal and the number of groups was three, Kruskal-Wallis one-way analysis of variance was employed for the analysis.

$P \leq 0.001$ ) are more frequent on infomercial than on commercial and information sites and commercial transaction items ( $\chi^2 = 84.28$ ,  $df = 2$ ,  $P \leq 0.001$ ) are more frequent on infomercial and commercial sites than on information sites. The opposite occurs with the non-commercial information category index ( $\chi^2 = 24.66$ ,  $df = 2$ ,  $P \leq 0.001$ ), which is more common on information sites. Concerning the interactive category, commercial and infomercial sites have more interactive features than information sites ( $\chi^2 = 25.77$ ,  $df = 2$ ,  $P \leq 0.001$ ).

## Discussion

As an exploratory content analysis of diet and dieting-related Web sites, this research attempts to describe the composition of current sites and to assess differences in composition among different categories of sites.

In terms of commercial information items, the sampled sites were

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generally well equipped with copyright notices, personal testimonials, logos, statements of confidentiality, and executive profiles. Banner ads were more common on informational sites, and dieting strategies on infomercial sites. The assumed high credibility of informational sites might lead to more banner ad placements as it would seem those sites would attract more traffic.

Diet sites, on the contrary, are not fully embracing interactive communication capabilities. Most sites still rely on one-way or non-synchronous interactive items such as 'submit a question', 'contact information', and 'Q & A'. Comparatively few informational and infomercial sites employed 'online community' and 'chat room' to create a synchronous dialogue loop with visitors.

Diet sites' ability to be an information provider for interested members of the public was somewhat mixed. Diet sites are using the Web's power in providing specific diet information, such as 'supportive materials',

'common diet information', 'recipés', and 'calories/BMI calculator' to name a few. But more diet information without profit making purposes appeared in information and infomercial sites than commercial ones.

While this study helps lay the foundation for a descriptive understanding of current diet and dieting-related Web sites, our understanding of the general factors that determine the desired functions of these sites remains incomplete. These diet-related sites could be used as a supplement for providing information within a broader, healthy, weight-maintenance strategy. For example, contact by additional means such as a visit with a nutritionist or email correspondence with a nutrition specialist could be employed to prompt dieting activities along with visiting the dieting-related sites.

Dieting sites may be a far more passive medium than has been previously assumed. In order to be less static, and to encourage users to

revisit and to persuade them to stay there long enough to comprehend the advice at the sites completely, it is critical to incorporate more interactive features that may be helpful in increasing engagement.

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