

Consumers' Credibility Perceptions and Attitudes Toward Prescription Drug Websites

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The purpose of this research is to examine the effectiveness of third-party versus brand-sponsored websites in enhancing consumer evaluations of website and information credibility and attitudes toward websites providing prescription drug information. It also examines the moderating effects of perceived risk and product category knowledge on the relationship between website type and consumer credibility perceptions and attitudes. The results of two experiments revealed no main effect of website type; instead, the effect of website type was moderated by perceived risk and product category knowledge. The impact of third-party websites was superior when perceived risk was high rather than low. Additionally, third-party websites were more effective when product category knowledge was low rather than high. Managerial and theoretical implications are discussed.

Keywords: prescription drugs, third-party website, brand-sponsored website, website credibility, information credibility, attitude toward site, brand attitude

Introduction

American consumers seek prescription drug information online; 33% of American adults and 45% of American Internet users have searched online for drug information (Fox and Jones, 2009). Thus, pharmaceutical firms have invested in developing brand-specific websites and, as a result, brand-sponsored websites have become a primary source for consumers to obtain prescription drug information. With the growth of brand-sponsored websites, several concerns regarding the efficacy of these sites have been raised. For example, studies show that consumers view information presented on brand-sponsored websites as highly untrustworthy (e.g., Huh, DeLorme and Reid, 2005).

Two major types of pharmaceutical websites are brand-sponsored and third-party drug websites. A brand-sponsored website is created and operated by a pharmaceutical company to provide prescription drug information including drug's risks and benefits directly to consumers and the general public. As such, it is a promotional effort by a pharmaceutical firm, similar to direct-to-consumer advertising in magazines or on television. For example, <http://www.lipitor.com> is the official site of Lipitor, a prescription medication to treat high cholesterol and lower the risk of stroke and heart attacks. Non-commercial third-party websites also disseminate prescription drug information. For example, PubMed Health's website, produced by the National Center for Biotechnology Information, offers exhaustive information and facts on diseases and drugs. For example, information about Lipitor is also available on the PubMed Health's website. This website often appears near the top of search engine results for most prescription medications.

As shown in Table 1, pharmaceutical websites have received limited research attention. Prior studies largely focused on website design, content, or features and utilized content analysis techniques to examine the content of pharmaceutical websites. For example, Macias and Lewis (2003) explored the content and form of pharmaceutical websites and found that these websites contain advertising appeals similar to those in print ads, but they include

more monetary incentives and much more medical and drug information. Another content analysis study by Huh and Cude (2004) examined the content (the quantity and quality of risk information) of pharmaceutical websites and reported an imbalance between risk and benefit information. Davis (2010) investigated information placement and form of presentation on pharmaceutical websites to maximize processing and recall.

Yet, despite the growing importance of brand-sponsored websites, relatively little is known about differences in consumers' evaluation of pharmaceutical brands and information found on brand-sponsored versus third-party websites (see Table 1). It is unclear whether a non-commercial third-party website produces more favorable consumer evaluations than a commercial brand-sponsored website. In addition, research has yet to examine the influence of consumer characteristics (e.g., risk perception and product knowledge) in such evaluations. Therefore, this study attempts to address these issues by examining consumers' evaluations of a third-party versus a brand-sponsored website. It also examines the moderating effects of perceived risk and product category knowledge on the relationship between website type and consumer beliefs and attitudes. The findings of this study could have potentially valuable practical implications which might help pharmaceutical companies effectively disseminate their drug information directly to consumers through a website.

Research Framework and Hypotheses

Third-Party Information on Credibility

Third-party sources are more credible than brand-sponsored sources. Studies of the impact of third-party involvement and/or certification in communicating information suggest that consumers should view independent organizations and government sources as more credible than commercial sponsors (Kamins and Marks, 1991). For example, advertising messages communicated via a third-party website generate more positive responses than via a firm's website (Sussan, Gould, and Weisfeld-Spolter, 2006). In fact, much research appears to indicate that consumers prefer independent information sources (e.g., a non-commercial third-party drug website) over brand-sponsored information sources as independent third-party sources frequently provide more alternatives from which consumers may choose, deliver more objective information, and facilitate consumers' external search efforts by decreasing search costs (Alba et al., 1997; Bakos, 1997; Lynch and Ariely, 2000; Senecal and Nantel, 2004).

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Table 1
Major Studies on Pharmaceutical Websites

Authors	Research Objectives	Study Methodology	Sample and data Source	Major findings
Macias and Lewis, 2003	Examine the content and form of brand-sponsored pharmaceutical websites	Content analysis	90 prescription drug websites	Prescription drug websites use advertising appeals similar to those found in print ads, but they include more monetary incentives and a much higher degree of medical and drug information.
Huh and Cude, 2004	Examine the content of brand-sponsored pharmaceutical websites	Content analysis	60 prescription drug websites	Imbalance between risk and benefit information on prescription drug websites.
Macias and Lewis, 2006	To examine whether the FDA's fair balance criteria are being met, how they are rated according to industry evaluation criteria, what impact they may have upon the patient-physician relationship, and how the content of these websites compares to that of print DTC ads	Content analysis	90 prescription drug Websites	Most websites met fair balance and adequate provision criteria, as well as several industry evaluative criteria. A comparison to print DTC reveals some strengths of the websites.
Davis et al., 2007	To determine the extent to which risk information was completely communicated by drug websites.	Content analysis	44 prescription drug websites	Pharmaceutical websites are unlikely to completely communicate risk information
Sheehan, 2007	To examine whether risk information presentation is consistent across prescription drug sites	Content analysis	91 prescription drug websites	Lack of consistency in the ways that websites present information specially risk information in most drug categories.
Kees et al., 2008	To examine the impact of certain presentation formats and types of risk information provided on a drug websites and the effect on consumers' perceptions of risk and fair balance	Experiment	194 undergraduate students	A bias of omission can occur in Internet DTC context i.e., the risks of treating a health condition using a hypothetical prescription drug were perceived to be greater than the risk of inaction. Presentation of a "black-box" warning or the warning strength did not affect the broader construct of fair balance.
Davis, 2010	To determine how information on pharmaceutical web sites can be presented to maximize processing and recall	Experiment	177 individuals (Experiment 1) 391 individuals (Experiment 2)	Placement and form of presentation exert a significant influence on subsequent recall, particularly when these influences are examined across age groups

Conversely, a communicator is perceived as prejudiced when the consumer receiving the message deduces that the message's position

or recommendations can be attributed to the communicator's personal interest. For example, when consumers perceive an advertiser or

salesperson as trying to persuade them to take actions that will benefit the promoted brand (e.g., increased product sales or sales of add-on features, greater price premiums or profit margins, a false sense of urgency, or reduced consideration of alternatives); then consumers' level of skepticism increases while their attitudes and behavioral intentions grow less favorable compared to their reactions when they perceive that same advertiser or salesperson as merely trying to provide entertainment or information to aid consumer decision-making (e.g., Buvár and Orosz, 2020; Chu, Gerstner and Hess, 1995; Wei, Fischer and Main, 2008).

Friestad and Wright's (1994) Persuasion Knowledge Model can provide a theoretical basis for consumer responses to perceived persuasion attempts, such as those encountered in brand-sponsored websites that promote prescription drug adoption and use. Generally, research has found that when a communicator (e.g., a brand-sponsored instead of a third-party website) prompts consumers to activate their persuasion knowledge, consumers become more skeptical and question the credibility of the communicator and the claims presented (e.g., Friestad and Wright, 1994; Isaac and Grayson, 2015).

Providing an additional theoretical perspective, the discounting principle of attribution theory (Kelley, 1973) posits that "the role of a given cause in producing a given effect is discounted if other plausible facilitating causes are also present". Applied to the communication domain, this theory may suggest that a message can be perceived as unprejudiced if the recipient can deduce that the communicator is an uninterested third-party, but a message will be perceived as prejudiced and its information and recommendations will be discounted if the recipient perceived that the communicator is someone with a vested interest. Applying this in the pharmaceutical website context, we posit that non-commercial third-party prescription drug websites, compared to a brand-sponsored website for the same pharmaceutical medication, will be perceived as more trustworthy or credible information source.

Credibility enhances the persuasiveness of communicators and their messages. Research indicates that highly credible message sources are more persuasive than less credible sources because message receivers are less likely to discount message arguments when source credibility is high (Eagly and Chaiken, 1975). Further, even when consumers recognize the persuasive intent of message, they may still evaluate the communicator and the message favorably if the communicator has used credible communication tactics (Isaac and Grayson, 2015). Also, in an advertising context, source credibility is directly related to consumers' attitudes toward the advertisement, brand attitudes, and purchase intentions (Goldsmith, Lafferty and Newell, 2000). Thus, compared to brand-sponsored websites, third-party websites should be viewed as more credible, providing more credible information and eliciting more favorable attitudes toward the site and the pharmaceutical brand mentioned.

H1: A third-party website will lead to more favorable (a) website credibility, (b) information credibility, (c) attitude toward the website, and (d) brand attitude than a brand-sponsored website.

Perceived Risk as a Moderator

Perceived risk, defined as the uncertainty regarding a particular purchase decision combined with concerns about the potential unfavorable consequences that might result from taking the wrong action has received considerable attention from marketing researchers (e.g., Gemünden, 1985; Gurhan-Canli and Batra, 2004; Wangenheim

and Bayón, 2004). While the literature has identified a number of risk dimensions such as financial, performance, physical/health, social, and psychological (see Jacoby and Kaplan, 1972), the most important component of perceived risk in pharmaceutical use is physical risk -- potential physical or health risks associated with a product. Research shows that perception of risk increase when negative outcomes are likely or when uncertainty is high (Gurhan-Canli and Batra, 2004). In conditions of high perceived risk, consumers are motivated to reduce negative consequences and are likely to engage in extensive information search (Gemünden, 1985). Also, some communicator characteristics (e.g., expertise and similarity to the consumer) have a greater effect on consumer responses when perceived risk is high rather than low (Wangenheim and Bayón, 2004).

However, little is known about how different levels of perceived risk influence consumer responses toward and evaluations of specific external sources of information (e.g., WOM, advertisements, websites). Thus, the current study examines perceived risk as a potential moderator of pharmaceutical website type effects on consumer evaluations of source and information credibility as well as website and brand attitudes. As such, this study expands perceived risk theory by suggesting that consumers not only engage in extended external information search when perceived risk associated with a product is high as prior research has established (e.g., Gemünden, 1985), but that preference for unbiased independent sources further enhances the credibility of third-party over brand-sponsored sources and the associated evaluations of information credibility and attitudes toward the source and recommended brand when perceived risk is high instead of low. more credible information sources. Thus, we hypothesize that perceived risk moderates the relationship between pharmaceutical website type (brand-sponsored versus third-party websites sponsored by an independent organization or government agency) and credibility and attitude evaluations such that:

H2: A third-party website will lead to a stronger favorable (a) website credibility, (b) information credibility, (c) attitude toward the website, and (d) brand attitude than a brand-sponsored website when perceived risk is high rather than low.

Product Category Knowledge as a Moderator

In addition to perceived risk, the current research also examines whether or not product category knowledge influences consumer preference for unbiased, independent sources. Product category knowledge is a consumer's prior domain-specific conceptual and perceptual knowledge about a product, its features, benefits, brands, procedures, and uses; and the terminology, lingo, jargon, abbreviations, and conventions used when communicating about the product (Beatty and Talpade, 1994; Clemente et al., 2014; Huhmann, 2017).

While studies have explored an effect of consumers' product-category knowledge on information search behavior (Brucks, 1985) and household decision-making (Beatty and Talpade, 1994), research that investigates product-category knowledge on evaluations of credibility and attitudes related to type of information sources is rare. However, research has shown that low versus high product-category knowledge affects consumer reliance on intrinsic versus extrinsic cues (Clemente et al., 2014; Rao and Monroe, 1988). Thus, for credibility and attitude evaluations, the current research expects consumers with low product category knowledge to rely more on the extrinsic cue of the type of pharmaceutical website (brand-sponsored versus third-party), whereas high product-category knowledge consumers will use intrinsic cues (i.e., their ability to comprehend and assess the pharmaceutical brand information). Thus, the

following moderation effect of product category knowledge on the relationship between website type and consumer evaluations of credibility and attitudes is predicted:

H3: A third-party website will lead to a stronger favorable (a) website credibility, (b) information credibility, (c) attitude toward the website, and (d) brand attitude than a brand-sponsored website when product-category knowledge is low rather than high.

Methodology

Study 1

Study 1 employed a 2 (Website type: Brand-sponsored vs. Third-party) \times 2 (Perceived risk: High vs. Low) \times 2 (Product-category knowledge: High vs. Low) factorial experimental design. Different versions of two types of test websites were created, which were closely modeled on actual websites. The third-party website included the name of a third-party (PubMedHealth) at the top-left corner of the home page (see Appendix 2). Versions of the brand-sponsored website (lubien.com) associated with a brand name (Lubien) were also created (see Appendix 1). Different versions of websites were examined by an expert panel to investigate if they met the criteria required for the research conditions. One site was chosen by the expert panel as best reflecting the requirements for a website to be classified within each category.

To avoid the effect of an existing brand's familiarity or liking on evaluations, a fictitious new brand name for a sleep aid (i.e., Lubien) appeared on both websites. To enhance internal validity, both websites used the same information content.

An email solicitation with a link directing respondents to one of the website stimuli and a survey questionnaire was sent to each participant. Subjects were randomly assigned to one of the two websites. Participants were instructed to spend about 5 minutes surfing the website before they completed the survey.

A total of 264 undergraduate students were recruited from a Northeastern U.S. university. College students were selected as an appropriate sample for a study related to a prescription sleep aid as prior research has found that up to 60% of all college students suffer from poor sleep quality and at least 7.7% suffer insomnia (Schlarb, Friedrich and Claßen, 2017). Of the sample, 54 percent were female. The mean age was 26 years, ranging from 19 to 42 years. Participant ethnicities were: White (48%), Hispanic (22%), African American (17%), and other (13%). On average, they spent 17.96 hours per week on the Internet. Participants indicated that they are likely to search online when they need information about medications (Mean = 5.20 on very unlikely [1] to very likely [7] scale).

Measures

Website Credibility. All items were measured on seven-point scales. To assess participants' perceptions of a website's trustworthiness and believability, a Likert-type website credibility measure was adapted from Rains and Karmikel (2009), Dutta-Bergman (2004), and Lee and Nass (2004). Following a stem of "I perceive the site to be...", the website credibility measure includes the following five items: "Believable", "Trustworthy", "Accurate", "Complete", and "Biased (reverse item)".

Information credibility. Three commonly used items assessed information credibility, which is the extent to which one perceives the website information to be believable (Gaziano and McGrath, 1986; Eastin, 2001). With endpoints of "not at all accurate" (1) and "very accurate" (7), sample items include: "How believable was the information covered in the web page?" and "How accurate did you find the information presented in the web page?".

Attitudes. Consumer's attitude toward brand was measured using Putrevu and Lord's (1994) five-item Likert-type measure. Sample items include "I think this drug has a lot of beneficial characteristics" and "I have a favorable opinion of this drug." Attitude toward the website was assessed with a three-item measure (Coyle and Thorson, 2001). Following the stem "Please rate your attitude toward the website", respondents rate the website on scales with endpoints of bad/good, disliked/likable, and unfavorable/favorable.

Perceived risk. Three seven-point items measured perceived risk (Stone and Gronhaug, 1993). Using a Likert-type scale, respondents indicated their agreement with the following items: "There is a chance that there are potential physical risks associated with this sleep aid medication", "There is a chance that this sleep aid medication may cause severe side-effects" and "I think this sleep aid medication is safe to use"(r).

Product-category knowledge. Product category knowledge was measured using Beatty and Talpade's (1994) three-item scale. Using a Likert-type scale, respondents indicated their agreement with the following items: "I feel very knowledgeable about this product", "If a friend asked me about this product, I could give them advice about different brands" and "I feel very confident about my ability to tell the difference in quality among different brands of this product."

Because perceived risk and product category knowledge were metric variables, a median split technique was used to dichotomize it into high and low categories (median for perceived risk = 5.00; SD = 0.78 and median for product category knowledge = 2.67; SD = 1.42). Factor loadings for all items, ranging from .56 to .78, are above or close to .5, the cut-off value recommended by Hair et al. (2010). Construct reliability of these measures exceeds .6, the threshold value recommended by Bagozzi and Yi (1988).

Statistical Analysis

A multivariate analysis of variance (MANOVA) statistical approach was used to analyze data. Basic assumptions of MANOVA were evaluated before testing the hypotheses. Non-significant Levene's test ($p > .05$) suggests that the assumption of equality of variance was not violated. Additionally, the non-significance of Box's M test ($p > .05$) confirms that the assumption of equality of covariances among the set of dependent variables is met.

Results of Study 1

Hypothesis 1 predicted that a third-party website would lead to more favorable website credibility, information credibility, attitude toward the website, and brand attitude than a brand-sponsored website. As presented in Table 2, multivariate tests did not support H1 a main effect for website type (Wilks' $\lambda = .993$, $F(4,253) = .450$, ns) suggesting that consumers' evaluations were not more favorable for a third-party website than a brand-sponsored website.

Table 2
Multivariate and Univariate F-values for the Dependent Variables

Source	MANOVA	Site credibility	Information credibility	Attitude toward site	Brand Attitude
Website type (A)	.450	1.271	.228	.588	.524
Perceived risk (B)	1.602	1.781	4.481*	1.626	1.372
Product category knowledge (C)	2.019	3.911*	1.696	4.776*	1.081
A × B	2.895*	4.868*	7.678**	2.311	2.206
A × C	2.433*	4.788*	3.60*	4.10*	2.177
B × C	.815	.134	2.59	.645	.692
A × B × C	.474	.158	1.704	.240	.002

Note: MANOVA degree of freedom (df) = 4/253, Univariate df = 1/256. Significant at * $p < .05$, ** $p < .01$.

Hypothesis 2 predicted that perceived risk would moderate the relationship between website type and the consumer evaluations of website credibility, information credibility, attitude toward the website, and brand attitude such that greater favorability would be present for a third-party than a brand-sponsored website when perceived risk is high rather than low. This hypothesis received partial support (Wilks' $\lambda = .956$, $F(4,253) = 2.895$, $p > .05$). Under high rather than low perceived risk, the third-party website generated more favorable evaluations of (H2a) website credibility ($F = 4.868$, $p < .05$) and (H2b) information credibility ($F = 7.678$, $p < .01$) than the brand-sponsored website. However, the results did not support H2c related to attitude toward site ($F = 2.311$, ns) nor H2d related to brand attitude differences ($F = 2.206$, ns).

Hypothesis 3 predicted that product-category knowledge would moderate the relationship between website type and consumer evaluations of website credibility, information credibility, attitude toward the website, and brand attitude such that a third-party website would lead to greater favorability than a brand-sponsored website when product-category knowledge is low rather than high. In support of the hypothesis (Wilks' $\lambda = .963$, $F(4,253) = 2.433$, $p < .05$), the third-party website received more favorable evaluations of (H3a) website credibility ($F = 4.788$, $p < .05$), (H3b) information credibility ($F = 3.60$, $p < .05$), and (H3c) attitude toward the website ($F = 4.10$, $p < .05$) than the brand-sponsored website when product-category knowledge was low than high. However, results did not support H3d related to brand attitude differences ($F = 2.177$, ns).

Study 2

Whereas Study 1 had used individual differences in risk perceptions to test Hypothesis 2's predicted moderation effect of perceived risk on the website type-consumer evaluation relationships, Study 2 manipulates perceived risk via the type of medication. The Food and Drug Administration has issued several warnings regarding prescription and over-the-counter sleep aids, such as Lunesta, Sonata, Ambien, Intermezzo, Benadryl, and Unisom (e.g., Food and Drug Administration, 2013, 2019). Also, sleep aids tend to have more severe side effects than allergy medications (Goldberg, 2018). Thus, a fictitious prescription sleep aid (Lubien) was used as the high risk medication and a fictitious prescription allergy drug (Allergyaid) was used as the low risk medication.

To investigate perceived risk due to different types of medication, Study 2 employed a 2 (Website type: Brand-sponsored vs. Third-party) × 2 (Perceived risk: High vs. Low) factorial experimental design. Four websites were created -- a brand-sponsored website and a third-party website for each medication (the high-risk sleep aid and the low risk allergy medication). Procedures

and measures in Study 1 were employed in Study 2. The sample included 236 students, of which 58 percent were female. The mean age was 24 years.

Results of Study 2

As a manipulation check, subjects indicated risk perceptions associated with the medication. Participants exposed to a website for the sleep aid reported higher perceived risk than those exposed to a website for the allergy drug ($M = 5.193$ vs. 4.693 ; $F(1,234) = 8.132$, $p < .01$). Both Levene's test and Box's M test were not significant ($p > .05$) ensuring that the assumptions of equality of variance and covariances among the set of dependent variables were met.

A separate MANOVA revealed a two-way interaction between website type and perceived risk in support of Hypothesis 2 (Wilks' $\lambda = .895$, $F(4,229) = 6.682$, $p < .01$). With the high risk prescription medication, a third-party website led to more favorable website credibility ($F = 20.778$, $p < .01$) and information credibility ($F = 12.394$, $p < .01$) than a brand-sponsored website. However, consistent with Study 1, such effects did not emerge in regard to attitude toward the website ($F = 1.864$, ns) or brand attitude ($F = 2.481$, ns).

Discussions and Implications

Despite the growing importance of websites as a vehicle for the diffusion of pharmaceutical information to consumers, relatively little is known about how different types of website information sources impact consumer evaluations. This study was the first of its kind to examine the effectiveness of two types of websites (i.e., brand-sponsored websites and third-party websites). Surprisingly, whether consumers gathered information from a brand-sponsored website or a third-party website did not directly influence website information credibility nor consumers' attitudes towards the website and the brand. Unlike previous studies (Alba et al., 1997; Lynch and Ariely, 2000; Senecal and Nantel, 2004; Sussan et al., 2006), in our study, a third-party website was not consistently viewed as more credible (i.e., trustworthy and believable) than a brand-sponsored website among consumers overall.

However, the current research did identify certain consumer characteristics that appeared to heighten the credibility of unbiased, independent websites sponsored by a third-party, such as an unaffiliated or noncommercial organization or government agency. Specifically, perceived risk and product category knowledge moderated the effect of website type on consumer evaluations of credibility. Under high perceived risk and low product knowledge situations, consumers tended to trust information on a third-party website more than that on a brand-sponsored website. Thus, third-party websites are most useful in communicating information about products with high physical risk (e.g., prescription medication),

among consumers that perceive a product as riskier, and among low product-category knowledge consumers. In addition to deeming such websites and the information they conveyed as more credible, low product-knowledge consumers also held better attitudes towards third-party websites than did high product-knowledge consumers. We, therefore, recommend that pharmaceutical manufacturers communicate information about prescription drugs with severe side effects or for higher risk medical conditions through identifiable and credible third-party sponsored websites (e.g., WebMD.com) as such websites produce favorable consumer evaluations and attitudes. Also, those who are unfamiliar with or feel less knowledgeable about medications are best reached with pharmaceutical information through third-party sources, such as independent medical-related bloggers and social media pages as well as third-party websites such as those sponsored by WebMD, the Mayo Clinic, or Medline Plus (a joint venture between the U.S. National Library of Medicine and National Institutes of Health).

For these third-party sources of pharmaceutical information, the danger is that they lose their credibility and, hence, the reason that certain consumers would seek information from these sources. If consumers judge that such websites are too beholden to pharmaceutical advertisements or sponsored content brought to consumers by drug companies, then consumers' view of these third-party sources as unbiased and independent could change and limit their effectiveness in communicating information about prescription drugs and other treatment options. Future research should explore this possibility.

The results also indicate that brand-sponsored websites primarily benefit consumers with high product-category knowledge, who have a more positive attitude toward these sites and view them and the information they convey as credible. Thus, pharmaceutical companies can tailor their messages on brand-sponsored websites to high product-category knowledge consumers and incorporate more detail, conceptual and perceptual information, and feel free to use more precise terminology and domain-specific language when disseminating information about the pharmaceutical and its usage, benefits, risks, side effects, and contraindications.

On the other hand, a third-party website is viewed more favorably and as a more credible source, which conveys more credible information than a brand-sponsored website when product category knowledge is low rather than high. Thus, third-party websites should be more useful when introducing a new prescription drug brand or treatment option.

The current research contributes to the literature on consumer response to pharmaceutical websites by investigating credibility or consumers' trust in or propensity to believe a website and the information on it. Credibility is an important concept to consider because prior research has found that when consumers trust online prescription drug information, they are more likely to consult with doctors about prescription drugs, discuss the prescription drugs with other people, and to conduct additional external searches for information about prescription drugs (Huh, DeLorme and Reid, 2005).

From a consumer welfare perspective, public policymakers should encourage third-party involvement in disseminating information about high risk products. The current research demonstrates that these third-party sources would be viewed more favorably and as more credible among populations that are more vulnerable, such as less knowledgeable consumers or those who perceive pharmaceutical medications as posing greater physical or health risks to themselves. Actions, such as certification or accreditation, that can help such consumers more easily identify

sources of unbiased and independent information would further reassure more vulnerable consumers of the usefulness of these sites as opposed to brand-sponsored websites, which they suspect of holding a promotional bias, or other more dubious competing information available on the Internet.

Finally, this study also offers a unique contribution to marketing theory by confirming a constructive role of third-party sources involved in communicating product information online in the context of websites or other electronic platforms, such as social media pages, online video, or blogs. This is an important emerging vehicle for transmitting product information.

Limitations and Future Research

As with other studies, this study suffers from a number of limitations. Of them, these studies relied on a convenience sample. Thus, future studies should reexamine the findings of this research by using other samples especially target groups such as individuals with a medical condition. In these studies, we examined only two types of pharmaceutical websites: a brand-sponsored website and a third-party website. Future research should extend our studies by examining the effectiveness of other forms of online pharmaceutical information sources, such as commercially linked third-party sponsored brand websites (e.g., RxList.com or Drugs.com) or free Internet encyclopedias (e.g., Wikipedia.com or Answers.com).

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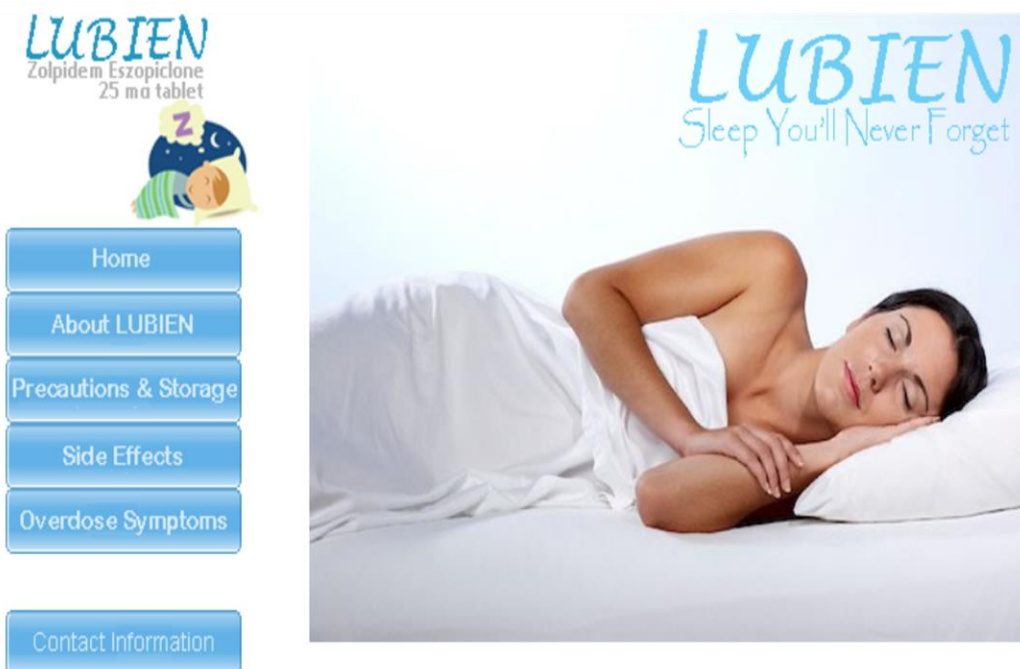
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Appendix 1 Brand-sponsored website

The image shows a screenshot of the LUBIEN website. On the left side, there is a vertical navigation menu with blue buttons containing the following text: "Home", "About LUBIEN", "Precautions & Storage", "Side Effects", "Overdose Symptoms", and "Contact Information". Above the "Home" button is the LUBIEN logo, which includes the text "LUBIEN Zolpidem Eszopiclone 25 mg tablet" and a small illustration of a person sleeping with a large letter 'Z' above their head. To the right of the navigation menu is a large photograph of a woman lying in bed, covered with a white blanket, appearing to be asleep. The text "LUBIEN Sleep You'll Never Forget" is overlaid on the top right of the photograph.

LUBIEN is used to treat insomnia (difficulty falling asleep or staying asleep). LUBIEN belongs to a class of medications called sedative-hypnotics. It works by slowing activity in the brain to allow sleep.

Appendix 2 Third-party website



LUBIEN (Zolpidem Eszopiclone)

LUBIEN is used to treat insomnia (difficulty falling asleep or staying asleep). LUBIEN belongs to a class of medications called sedative-hypnotics. It works by slowing activity in the brain to allow sleep.



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