

Marketing Dietary Supplements:
Public Relations and the Ability of Pharmaceutical Companies to Retain and Develop Consumer
Relationships

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Abstract

Dietary supplements have grown in popularity in recent years, with multivitamins the most commonly used. As the awareness of dietary supplements continues to increase, there are more chances for consumers to misuse or misunderstand the risks of taking dietary supplements. Public relations, physicians, and pharmaceutical companies should work to educate the consumer about the uses and risks of supplements. This paper addresses the issues associated with dietary supplements, particularly in the area of weight-loss supplements. Adverse side effects are addressed, as well as how public relations can influence the outcome of pharmaceutical companies' relationships with consumers. Public relations can help the target audiences build trust with companies, though at times marketing supplements can interfere with a healthy lifestyle. The lack of regulation on dietary supplements provides consumers with more freedom, but also leaves room for uncertainty and confusion about the science behind dietary supplements.

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Chapter 1

Introduction

Statement of the Problem

This study means to develop a stronger consumer relationship with pharmaceutical companies in the area of dietary supplements. The consumer's understanding of these dietary supplements should be derived from the effects of marketing and a physician's expertise in a healthy and safe manner. The marketing affects the companies' ability to sell their products, as well as how consumers interpret the cost and effectiveness of the drug. "Thus, drug marketing—and even supplement marketing—should be treated with caution lest such products seduce consumers into treating them as 'get out of jail free' cards" (Bolton, Reed, Volpp, and Armstrong, 2007, p. 725).

After the enactment of the Dietary Supplement Health and Education Act of 1994 (DSHEA), supplements went from being considered foods to simply dietary supplements (Nichter, 2006). By improving consumer education of dietary supplements through marketing, advertising, and physician knowledge, pharmaceutical companies can build a stronger relationship with users of dietary supplements. This relationship can bring a deeper understanding of the consumers' wants and needs.

Background of the Problem

There is not much information about the consumers' knowledge of regulation on dietary supplements. Many experiments on supplement knowledge focus on reactions from consumers and perceptions of dietary supplements from marketing and advertising. The majority of supplement sales are done directly to the consumer, in pharmacies, health food stores, or

supermarkets (Temple, 2010). “Nevertheless, whenever a customer asks for advice, the staff is usually uninhibited in recommending the purchase of one or more supplements” (Temple, 2010). Marketing techniques should improve upon the knowledge of supplement usage and the science in producing supplements, rather than on the supplement itself. By providing the background of how supplements are manufactured, as well as how supplements achieve their cost (making the information available to the public), companies would be able to communicate better with consumers.

Under the DSHEA, “products will not require U.S. Food and Drug Administration [FDA] approval or submission of efficacy and safety data prior to marketing under the new regulation” (Sadovsky, Collins, Tighe, Brunton, and Safeer, 2008). This act allows consumers to gain freedom in deciding the supplements he or she can use. With this freedom, comes a risk that the supplements’ side effects would be overlooked by the consumer. This risk brings pharmaceutical companies into the domain of those to be at fault if the consumer does not comprehend the side effects.

With the increased use of dietary supplements in the U.S., the release of knowledge and education of consumer is much needed. Sadovsky et al. (2008) mentioned in a study that the dietary supplement use among U.S. adults was 73 percent in 2002. The high percentage should lead pharmaceutical companies and physicians to obtain a hand in how the marketing of supplements can affect their consumers through providing, in detail, the abilities and risks of the supplements and any reactions with prescription drugs.

Purpose of the Study

Improving marketing strategies will provide pharmaceutical companies to present and

study how consumers of dietary supplements respond to advertising. Many companies increase the costs of the supplements and drugs, but neglect to include better access to knowledge about the uses and dangers about the supplements' handlings. In a study performed on 535 supplement products (produced by 238 companies), the most common issue seen on noncompliant products was "having no or [an] incomplete disclaimer with a structural/functional claim" (Meer, Misner, and Meer, 2004). Sixty-five percent of the products screened were noncompliant when compared with recent regulations (Meer et al., 2004). This astounding number should drive companies to take care in the marketing and labeling of dietary supplements.

The majority of dietary supplements do not require a prescription. The freedom consumers hold can put many parties at risk, if the dietary supplement is misused. For this reason, marketing the supplements needs care. Developing a relationship with the consumer, deeper than simply a "box" connection, will draw the consumer into the necessities about specific knowledge on the supplement. In addition, pharmaceutical companies lose revenue with the lost relationships. "A \$280 billion opportunity is left behind each year due to the failure of pharmaceutical companies to retain their customers" (LaFountain, 2011). The large amount lost due to consumer relationships, is the "equivalent to of the combined total global revenue in 2009 for the top six pharmaceutical companies" (LaFountain, 2011). By investigating the amount of the consumer's awareness of the regulations on dietary supplements, pharmaceutical companies and physicians will benefit from marketing strategies compelled to creating a long-lasting relationship with the consumer.

Setting for the Study

This study will be performed as a piece in the data collection for a Senior Project at

California Polytechnic State University in San Luis Obispo, California. Three interviews will be conducted, each an expert in the fields of public relations, pharmacology, and dietary needs (dietitian). Each expert will be asked the same set of questions. The questionnaire is designed to specifically answer the research questions and fill any voids in previous studies on dietary supplements and the marketing strategies and regulation knowledge of consumers.

Research Questions

The following research questions were written in conjunction with needed information and data in the area of dietary supplement marketing and the consumer-pharmaceutical company relationships. Each question was developed subsequently with examinations of existing material on the topic. This was performed in order to accurately and effectively address the issues, as well as to obtain knowledge from certified individuals in the areas of public relations, pharmacology, and dietary needs (dietitian) for the study.

1. What is the effect of public relations on how pharmaceutical companies readily gain long-lasting relationships with consumers?
2. How are current marketing strategies affecting consumers' lifestyles?
3. Do current marketing strategies effectively communicate the risks and uses of dietary supplements?
4. What is the level of understanding consumers have on the regulations of dietary supplements?
5. How do prescription drugs interact with the effects of dietary supplements?

6. The compound naringin is found in many dietary supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and medicines?

Definition of Terms

To assist the reader, the following terms have been defined to clarify their meanings within the contexts of the study.

Dietary Supplement: any product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, mineral, amino acid, herb or botanical; or a dietary substance used ‘...to supplement the diet by increasing the total dietary intake’; or any concentrate, metabolite, constituent, extract, or combination of any of these ingredients (Sadovsky et al., 2008)

Drug: any article (excluding a device) intended for use in the diagnosis, care, mitigation, treatment, or prevention of disease and articles (other than food) intended to affect the structure or function of the body (Bolton et al., 2007, p. 714)

Dietary Supplement Health and Education Act of 1994 (DSHEA): permits manufacturers to sell products without providing pre-market evidence of safety or efficacy (no FDA approval) (Ashar, Miller, Pichard, Levine, and Wright, 2007)

Boomerang Effect: consumers within the problem domain (relatively attracted to the risky behavior) perceive the remedy as a “get out of jail free” card that takes the risk out of risky behavior, thereby encouraging it (a remedy message opposite to the position intended) (Bolton et al., 2007, p. 714)

Naringin: found in grapefruit, contributing to its bitter taste; exerts a variety of pharmacological effects such as antioxidant activity, blood lipid lowering, anticancer activity, and inhibition of selected drug-metabolizing cytochrome P450 enzymes, including CYP3A4 and CYP1A2, which may result in drug-drug interactions *in vivo*; ingestion of naringin and related flavonoids can also affect the intestinal absorption of certain drugs, leading to either an increase or decrease in circulating drug levels (Meisenheimer, 2009)

Organization of Study

Chapter 1 consisted of the statement and background of the selected topic and problem, as well as the definition of selected terms. Chapter 2 will consist of the review of current literature and analyzing its effect towards the research questions posed in Chapter 1. Chapter 3 will be the methodology of the study. Chapter 4 will further analyze the research questions and discuss the answers in-depth in comparison to the current literature and expert knowledge. Lastly, Chapter 5 will include a summary of the study and suggestions for professionals in the fields of public relations, pharmacology, and dietary needs (dietitian).

Chapter 2

Literature Review

The literature review is designed to portray trends and similarities among the chosen sources of current material. Each section will represent the trends in categories of the sorted literature.

The “Boomerang Effect” of Public Relations

Marketing strategies can shape the outcome of a consumer’s daily life. Consumers are bombarded with various advertisements, daily, that can essentially play a major role in how the consumer chooses to purchase or gain interest in various products. The impact that marketing has on the consumer can either prevent or assist in a healthy lifestyle. A healthy lifestyle, “helps to prevent the onset of major premature debilitating conditions” (Bolton et al., 2007, p. 713). Drug and supplement marketing should help consumers to achieve this way of living.

Health remedy marketing can take the characteristics of either risk-avoidance or remedy marketing, according to Bolton et al. Ironically, remedy messages lead consumers to “perceive the remedy as a ‘get out of jail free’ card that takes the risk out of risky behavior, thereby encouraging it (i.e., a boomerang effect of the remedy message opposite to the position intended)” (Bolton et al., 2007, p. 714). The “boomerang effect” would give consumers a “perceived invulnerability by restoring health credentials, and would thereby disinhibit unhealthy behaviors” (Chiou, Yang, and Wan, 2011, p. 1085). This boomerang effect can lead consumers to believe marketing messages that may be misleading.

Policymakers tend to target “a typical, common, average or reasonable consumer” when shaping regulations (Mason and Scammon, 2011, p. 201). The “ ‘typical consumer’ is viewed in

the regulatory context as having (1) a normal intelligence enabling them to understand messages and (2) a willingness or interest in acquiring information” (Mason and Scammon, 2011, p. 203). Believing that the “typical consumer” will tread information down to non-information seekers, is a risk policymakers take. If information reaches only part of the intended public who consume dietary supplements, parties involved (policymakers, public relations advisors, company heads) will attain the brunt of the consequences. The DSHEA of 1994 did not require marketing and labeling of dietary supplements to require FDA approval (Mason and Scammon, 2011, p. 202). This regulation, with the intent to enhance consumer freedom and product availability, has the potential to sway consumers to lead unhealthy lifestyles.

The voids that the DSHEA of 1994 contains, should be filled using research and further investigation into what the consumer believes as well as understand about supplement regulation. Enhancing the public relations aspect in pharmaceutical companies by focusing more on how to provide consumers with information they do not know and attracting their interest, is a viable path in achieving a healthy lifestyle. Ame Wadler, chair of the U.S. healthcare practice at Burson-Marsteller, suggests that pharmaceutical companies enhance their image by taking “a ‘bottom up’ approach to communications, in which real people (read: patients) share their stories of how prescription drugs saved (or significantly improved) their lives” (PR News, 2004, 60 (30), p. 1). By enhancing the image of pharmaceutical companies and their approach to consumer wellness, consumers may take an interest in doing further research into the supplements they are using. “One-on-one patient education can work to mitigate the boomerang effect” and essentially provide consumers with a reference towards the risks and uses of the supplements being used. Over-the-counter drug status can allow supplements to be used

incorrectly but when taken with guidance from a physician or further personal research; supplements' risks can be decreased.

Improving the quality of the advertisements on supplements as well as increasing consumer awareness of the regulations on supplements, can help to improve consumer lifestyles in a positive direction. With pharmaceutical companies developing a sustainable brand, one that is agreeable and trusted by consumers, can ensure that funding for companies reaches the area of consumer knowledge. Marketing performance can be increased “by analyzing difficult-to-measure concepts such as brand perception, industry buzz, reputation and mindshare” (PR Newswire, 2002, p. 1). With such changes to the marketing strategies of dietary supplements, the “boomerang effect” can be avoided and further prevented.

Regulations of Dietary Supplements

The Dietary Supplement Health and Education Act (DSHEA) was passed in 1994, with the consumers' fear that access to supplements would be limited. Under the DSHEA, supplements would be classified as “a subcategory of food and frees them from drug safety and efficacy standards” (Mason, 1998). Though supplements are in a food subcategory, the Nutrition Labeling Education Act of 1990 did not apply under the DSHEA (Mason, 1998). For a supplement to be deemed hazardous, the FDA must “provide evidence that the product is unsafe, contains a controlled substance, or is absent ingredients listed on the product label after the product has appeared in retail outlets” (Denham, 2011). Health professionals should be concerned with the lack of efficacy the DSHEA allows companies to put on their labels. Consumers may be inclined to substitute supplements for prescription drugs, if misleading information is placed on supplement containers.

The DSHEA was passed in response to an eosinophilia-myalgia syndrome (EMS) outbreak in 1989, where 38 people died and 1500 cases of permanent disability were reported (Denham, 2011). The cause of the outbreak was an impure batch of l-tryptophan, a dietary supplement that had the ability to increase the levels of serotonin or melatonin in the brain. L-tryptophan was banned in 1991 (Gower, 1999). The number of people affected by the EMS outbreak, was a result of contamination during manufacturing as well as how readily available the supplement was to the U.S. population. With the supplement's use as being an antidepressant and aiding in sleep deprivation, overdose on the supplement could have occurred with the lack of regulation on supplement use.

Tighter regulations can help consumers understand the risks involved with taking dietary supplements (i.e. with prescription medications). The language used for communication on the labels should be clearly stated for consumers. A necessity to have marketers of dietary supplements “with regard to what types of information would constitute adequate substantiation of claims” as well as “a better understanding of appropriate uses of conventional...supplements” for consumers (Sanders and Levy, 2011). Marketers are concerned with the target audience and how that audience will react to the wording on labels of dietary supplements. Though parts of the intended audience may understand the difference between a health and structure/function claim, others will blur the line between the two terms. “Structure/function claims relate consumption of the product to the normal functioning of the human body” (Sanders et al., 2011). Health claims, on the other hand, “describe a relationship between a whole food, food component, or dietary supplement ingredient, and reducing risk of a disease or health-related condition” (Sanders et al., 2011). These claims may be influential on a consumer, if the consumer does not know the difference between the two terms.

Dietary supplements may be viewed “to provide dietary approaches to help consumers cope with health conditions, such as mild irritable bowel syndrome, or reducing the risk of getting common infectious diseases or traveler’s diarrhea” (Sanders et al., 2011). Supplements may aid in various health uses, but “claims regarding these uses are generally perceived by the U.S. regulatory agencies as not acceptable for conventional foods or dietary supplements” (Sanders et al., 2011). Many companies’ intentions for the product to be viewed by audiences as a dietary supplement may not come across as such if consumers are not educated about the scientific details of the product. Consumers need tools to associate the scientific basis of the supplements with the laws and regulations, as laws have a tendency to be less specific than the basis. Tools such as “guidance documents published by the FDA and other regulatory agencies but also standards set by private organizations or industry trade organizations” (Sanders et al., 2011). These tools help consumers understand the difference between claims and what the true use of the supplement is.

The freedom of the DSHEA allows companies to advertise without pre-approved phrases or claims. Regulators have the decision-making power to “decide that they are not responsible for ‘irresponsible’ consumers or ones who neglect information that would be adequate for more conscientious consumers” (Eggers and Fischhoff, 2004). This responsibility may not be sufficient with consumers. “Even when the operational intent of such rulings is clear, the regulatory philosophy that underlies them often is not” (Eggers et al., 2004). Consumer welfare needs to be considered in all aspects of the claims process. Regulators should have current education of dietary supplements, and access to supplement research should be readily available to consumers.

Consumer Knowledge of Supplement Regulation

There is not much known about the level of understanding that consumers have of supplements and their regulation. With the enactment of the DSHEA in 1994, consumers were empowered “to make their own choices, free from governmental restriction” (Ashar et al., 2007). The amount of knowledge left for consumers to discover, should be aided by the government’s involvement in providing the needed information to consumers in an accessible manner.

The high percentage of consumers today in the U.S. that use dietary supplements, 73 percent in 2002, deserves guidance and evidence-based claims of the supplements being used. According to Ashar et al., supplements (as a result of the DHSEA) lack “standardized guidelines...and dietary supplements can bear unsupported claims”. Under the DSHEA, “supplements are ‘regulated’ through post-market surveillance but not ‘pre-approved’” (Ashar et al., 2007). In a study researching patients’ understanding of supplement regulation, 52 percent did not know that the supplement was not approved by the FDA (Ashar et al., 2007). At the same time, 63 percent had no knowledge that the advertisement for the supplement had not been pre-approved (Ashar et al., 2007). Many characteristics are involved with the results of the study, including education, weight loss, and race. Consumer protection agencies “must consider the realities of consumer decision making, namely, how consumers understand a communication’s contents and apply them to their personal circumstances” (Eggers and Fischhoff, 2004). A study was conducted in the United States on whether weight loss supplements were pre-market approved for safety by the FDA; more than half of the 1400 adults surveyed believed weight loss supplements were regulated for safety (Dodge, Litt, and Kaufman, 2011, p. 231). In addition, a similar study was conducted on the knowledge of physicians about the regulation of dietary supplements. This study showed that, of the questions asked, only 59

percent of the answers were correct (Dodge et al., 2011, p. 231). Without increasing physician awareness in conjunction with equal accessibility for the variety of consumers unaware of the effects of dietary supplements, may “provide some patients with a false sense of security regarding safety and efficacy of these products” (Ashar et al., 2008).

Direct-to-consumer (DTC) advertising can have an influential effect on consumers. It can have the ability to “weaken the physician-patient relationship and adversely affect physician morale” (Ashar et al., 2008). This relationship provides patients (consumers) with confidence that supplements’ labels are being correctly advertised. “Patients may not realize that combining dietary supplements with their prescription medications can result in drug-dietary-supplement interactions” (Sadovskiy et al., 2008). DTC advertising can help pharmaceutical companies to widen brand demand on many prescription drugs and supplements. By giving companies freedom in marketing strategies, DTC advertising can “provide firms with incentives to attach missing information to their brands and to disseminate that information to increase brand demand” (Calfee, 2002, p. 178). DTC advertising can enhance the consumer’s mind, if physicians participate in spreading supplement information as well as advertisements able to adapt and reach a variety of consumers (educated and those without informational resources).

With the adversity among consumers of dietary supplements, there is an immediate need for a stricter regulation on the post-market surveillance of advertisements. “Sales of all supplements, especially vitamins, have increased rapidly in the past 15-20 years” (Perez, 2011). The self-reported adverse effects in 2002 (from the Health and Diet survey), conveyed that “33 percent took a dietary supplement instead of a prescription drug to treat or prevent a health condition, but only 54 percent discussed the substitution with a physician or other healthcare professional” (Sadvoskiy et al., 2008). These statistics, showing a lack of consumer confidence

in supplement risks and uses, portrays the need for tighter regulations. Consumer education should be evaluated and advertisements need to assist in consulting a physician or another reference for supplement uses.

Drug-Supplement Interaction

Consumers view dietary supplements as an addition to a diet, safe and natural. Though this may be in some cases, dietary supplements have been known to interact negatively with certain prescription drugs. This interaction “between natural products [supplements] and drugs can unintentionally reduce or increase the effect of the drug, resulting in therapeutic failure, or increase toxicity” (Joshi and Medhi, 2008). Drug-supplement interaction can be harmful rather than helpful if consumers are not aware of the scientific research behind many supplements and drugs.

Various compounds found in supplements can contribute to affecting “the way of metabolizing certain drugs by binding with drug ingredients, thus reducing their absorption or speeding their elimination” (Joshi et al., 2008). Cytochrome P450 (CYP450), an enzyme found in the small intestine, is readily involved in the metabolizing of 50 percent of prescription medications (Joshi et al., 2008). Research has shown that CYP450 enzymes can be inhibited by certain bioflavonoids found in grapefruit juice (GFJ). Unlike many citrus beverages, grapefruit juice “has been demonstrated to interact with a variety of prescription medication” (De Castro, Mertens-Talcott, Rubner, Butterweck, and Derendorf, 2006). A bioflavonoid (found in GFJ) involved in the inhibition of certain CYP450 enzymes is naringin (Meisenheimer, 2009). Naringin is a compound contributing to the bitter taste in grapefruit juice. It also “exerts a variety of pharmacological effects such as antioxidant activity, blood lipid lowering, anticancer

activity” (Meisenheimer, 2009). Particularly, naringin inhibits a form of the enzyme CYP450: CYP3A4 and CYP1A2. Some weight-loss supplements contain naringin and can have the same effect with prescription drugs as GFJ. The inhibition that can take place with GFJ-drug and supplement-drug interaction can greatly affect the risks or levels of the drug in the blood stream (De Castro et al., 2006). “Most notable are its effects on cyclosporine, some calcium antagonists, and statins, leading to elevation of the serum concentrations of these drugs from 1.5- to 15 fold after oral administration” (De Castro et al., 2006). Supplements containing naringin include: Beta Slim (NBTY, Inc.) and EndoBurn (BSN). Both supplements are involved in weight-loss, and feature “naringin” on the label in the list of ingredients.

The encounter of supplements with prescription drugs can be deadly if consumers do not take care to mention uses of supplements with a physician. Many aspects can affect the amount of supplement use with any prescription medication, including obesity. In the U.S., over half of adults take prescription medication, and one in six taking three or more medications (Department of Health and Human Services, 2011). At the same time, many people use weight loss supplemental products with the growing awareness of the advantages of weight loss products. These statistics pose a reminder to consumers, pharmaceutical companies, and physicians to be aware of adverse effects from drug-supplement interaction. “It would...be prudent for physicians prescribing the affected drugs and for pharmacists dispensing them, to warn patients not to take them with grapefruit juice” (Joshi et al., 2008).

Chapter 3

Methodology

This chapter presents the manner in which the data will be collected, who will be in the collection, how it will be presented, and the delimitations.

Data Sources

For this study, experts in the fields of public relations, pharmacology, and dietary needs (dietitian) were interviewed with the same set of questions. These questions were designed to answer the six research questions mentioned in Chapter 1.

Participants

Debby Nicklas, the executive director at French hospital Medical Center, a prominent medical center for San Luis Obispo residents, was chosen as the public relations expert. John Headding, a pharmacist with two stores in Morro Bay and Cambria, and was chosen as the expert in pharmacology. He has his Ph.D. in pharmacology, and will provide a myopic viewpoint towards the pharmaceutical industry. Dr. Susan Swadener, a clinical dietitian, specializes in people with eating disorders and disabilities in developments, was chosen as the expert in dietary needs.

Interview Design

The following questions were designed to answer the research questions mentioned in Chapter 1. These were asked of each of the experts and serve as data in this study:

1. What strategies do public relations officials of pharmaceutical companies use to gain long-lasting relationships with consumers? What aspects of the public relations area are dedicated to retaining these relationships?
2. In what ways are current marketing strategies affecting consumers' lifestyles (positively or negatively)? How are strategies adapting to consumers' changing lifestyles?
3. Do marketing strategies effectively communicate the risks and adverse side effects that dietary supplements can have with prescription medication? If so, in what ways? If not, in what ways could the strategies be improved, and what are the limitations?
4. How do pharmaceutical companies educate consumers about the risks of taking dietary supplements? What measurements are taken to ensure consumers have the right education about regulation on dietary supplements? What improvements can be taken?
5. What dietary supplements are known to interact with certain prescription drugs? How readily are dietary supplements approved by a professional, or suggested by a professional?
6. How often are dietary supplements brought to the attention of physicians or a professionals' attention?
7. Naringin can be found in many weight-loss supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and supplements?
8. Is it common for dietary supplements, particularly weight-loss supplements, to be inadequately labeled (i.e. leaving out certain ingredients)?

Data Collection

The method of data collection were three interviews, each with an expert in a field of study prominent in this study. The interviews were conducted in November 2011. The experts were asked to answer a questionnaire, designed to answer the research questions mentioned in Chapter 1.

Data Presentation

The data collected during each interview was documented through written verbatim notes (during and after the interviews) as well as typed answers through email. The notes and typed answers through email allowed the clarification of any voids that may occur in the context of the responses.

Limitations

There are some limitations in this study that occurred during the process of the interviews as well as in the study itself. Due to time constraints, John Headding, Dr. Susan Swadener, and Debby Nicklas were unable to meet for a face-to-face interview. The interviews with John Harding and Debby Nicklas were performed over the phone. This placed certain informalities and clarity of the responses. Also, Debby Nicklas was unable to answer five of the eight interview questions due to her qualification and experience dealing with dietary supplements. The interview with Dr. Susan Swadener was done through an email. The quality of the responses for this particular interview is verbatim to the expert's knowledge.

In the study itself, there were limitations to the amount of research available for the specifics of the study. The pharmaceutical effects of naringin were especially difficult to verify, as studies

done on the topic were minimal. The inadequate confirmation of products found to contain naringin could not be verified through the use of the internet, as the FDA does not regulate supplement use. Verification of the existence of products containing naringin was performed at The Vitamin Shoppe in San Luis Obispo, CA. The availability of many products found on the internet believing to contain naringin was nominal.

Delimitations

The study was conducted to investigate the effects of public relations on the marketing strategies of pharmaceutical companies to dietary supplement consumers. It was delimited to supplements containing naringin and researching marketing strategies pertaining to the knowledge and education of consumers on dietary supplement regulation. These delimitations were placed on the study to keep from placing too wide of a scope on the subject.

Delimitations were placed on the experts chosen for this study. This was done to focus the audience's view on the areas with a need for change. The areas of public relations, pharmacology, and dietary needs, were the pieces found to be lacking in research of knowledge and education of supplement regulations, as well as improving on consumer knowledge and education.

Chapter 4

Data Analysis

Chapter 4 will provide descriptions of the participants in the study and summarize the experts' answers to the interview questionnaire. The data will be presented in the form of direct quotations of paraphrased responses, as the length of the interviews was 30 minutes. These responses will then be analyzed and compared to the existing literature described in Chapter 2 as well as to the research questions mentioned in Chapter 1.

Description of Participating Experts in Related Fields

Public Relations

Debby Nicklas was chosen as the expert in public relations. She currently holds the position of Executive Director at French Hospital Medical Center. The hospital has won multiple awards for its excellence and quality in various areas of healthcare. With this position, she is in contact with many organizations as well as community members and is involved in situations where public relations is a the main goal.

Pharmacology

John Heading is the owner of two pharmaceutical stores, one in Cambria and the other in Morro bay, CA. His expertise as a pharmacist as well as a Ph.D. in Pharmacology will provide a deeper view into the pharmaceutical industry and the distribution and handling of many dietary supplements.

Dietary Needs

As an expert in dietary needs, Dr. Susan Swadener was chosen due to her knowledge as a clinical dietitian. She has an MS and Ph.D. in Nutrition from Cornell University as well as being the Dietetic Internship Director and Lecturer at California Polytechnic State University. She specializes in people with eating disorders and disabilities. Her years of experience and expertise in health, wellness, and fitness allow her to place an understanding on consumer needs.

Dietary Supplement Questionnaire

Each expert was asked the same set of questions based on consumer knowledge of dietary supplement regulation and the effects of public relations on pharmaceutical companies:

1. What strategies do public relations officials of pharmaceutical companies use to gain long-lasting relationships with consumers? What aspects of the public relations area are dedicated to retaining these relationships?

Question # 1 was designed to confirm and expand on the existing literature on the marketing strategies of pharmaceutical companies. It was meant to clarify the specifics of public relations in comparison to its relationships with consumers.

- John Headding: “They create relationships with physicians to get in a position to prescribe their medication, direct-to-consumer marketing, and advertise to pharmacists directly” (Appendix A).
- Susan Swadener: “Commercials on TV, ads in magazines, websites, and free samples [are examples of marketing strategies]” (Appendix B)

- Debby Nicklas: “They must try to generate good public relations [PR] that shows consumers how their product has helped, through testimonials and personal consumer experiences” (Appendix C).
2. In what ways are current marketing strategies affecting consumers’ lifestyles (positively or negatively)? How are strategies adapting to consumers’ changing lifestyles?

Question # 2 was designed to exemplify the effects that the marketing of dietary supplements is capable of having on consumers. It was meant to show the reader the current marketing strategies with the knowledge of the experts.

- John Headding: “In a negative view, patients are getting placed on drugs they don’t need—seeking these drugs from doctors. Positively, more people are aware and educated about the states of diseases” (Appendix A).
 - Susan Swadener: “Perhaps they are more educated but also they may not need supplements at all. People today are too busy to eat right, [and strategies play on that aspect]” (Appendix B).
 - Debby Nicklas: “I think pharmaceutical companies push how their products can contribute to a happier lifestyle. Baby boomers are a target audience, and the marketing is more geared towards the positive side of life” (Appendix C).
3. Do marketing strategies effectively communicate the risks and adverse side effects that dietary supplements can have with prescription medication? If so, in what ways? If not, in what ways could the strategies be improved, and what are the limitations?

Question # 3 is meant to show the reader the effectiveness of marketing supplement risks and uses to consumers. This question poses the thought that current strategies may not be effective and improvements are needed.

- John Headding: “Yes and No. Strategies are very detailed in informing the public of adverse side effect. For those who rely on going to health food stores without seeing a physician or pharmacist first, there are the harms and dangers of asking advice from someone who isn’t qualified to answer questions of supplement and drug interactions” (Appendix A).
- Susan Swadener: “Not that I am aware of. Strategies should mention medications that contraindicate [counteract] with the supplement the consumer is taking” (Appendix B).
- Debby Nicklas: “I think they do [for prescription medications]; they will say potential side effects. As a consumer, I don’t know about the marketing that dietary supplements have, whether it’s good or bad” (Appendix C).

4. How do pharmaceutical companies educate consumers about the risks of taking dietary supplements? What measurements are taken to ensure consumers have the right education about regulation on dietary supplements? What improvements can be taken?

Questions # 4 is meant to further portray improvements pharmaceutical companies could be making. This question takes into depth how consumers can be educated on dietary supplement regulation and the areas that consumers need extensive education of.

- John Headding: “They haven’t done a good job. I think there’s a limited amount of education consumers are exposed to. People are seeking quick fixes and can end up abusing and misusing products” (Appendix A).
 - Susan Swadener: “I am not aware that pharmaceutical companies are educating consumers. The measurements being taken include talking to registered dietitians and looking on the FDA website” (Appendix B)
 - Debby Nicklas: N/A (Appendix C).
5. What dietary supplements are known to interact with certain prescription drugs? How readily are dietary supplements approved by a professional, or suggested by a professional?

Question # 5 is meant to show the reader the supplements that interact with prescription drugs so the reader is aware of what he or she is taking. The question is also designed to clarify the availability of supplements and how professionals can be involved in the process of choosing a supplement.

- John Headding: “Literally every product that’s over-the-counter has an interaction with a prescription medication. Supplements are commonly suggested by professionals, but over-the-counter marketing can be potentially harmful, especially at health food stores” (Appendix A).
- Susan Swadener: “Tryptophan and St. Johns Wort with SSRIs are known to interact with proscription drugs. Supplements are readily suggested if proven effective for that particular patient” (Appendix B).

- Debby Nicklas: N/A (Appendix C).

6. How often are dietary supplements brought to the attention of physicians or a professionals' attention?

Question # 6 was designed to bring attention to the consistency of supplement usage that physicians and professionals are aware of. It is meant to encourage consumers to seek out professional advice if they are taking prescription medications and dietary supplements.

- John Headding: "Rarely ever are dietary supplements brought to our attention. There is mainly direct-to-consumer advertising; there isn't much advertising towards physicians" (Appendix A)
- Susan Swadener: "I always ask my clients as a registered dietitian" (Appendix B)
- Debby Nicklas: N/A (Appendix C).

7. Naringin can be found in many weight-loss supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and supplements?

Question # 7 is meant to focus more particularly on products containing naringin, a delimitation placed on this study. Naringin's presence in many weight-loss supplements is important when many Americans have tried or use these supplements.

- John Headding: "Through the FDA, the more problems with a supplement, the FDA will step in and either pulls it from the shelves or put restrictions on it. If naringin has

problems, then marketing strategies are either halted or altered depending on what problems the FDA is aware of” (Appendix A).

- Susan Swadener: “Marketing strategies need to tell consumers that it can decrease the metabolism of certain drugs and therefore causing toxic levels” (Appendix B).
- Debby Nicklas: N/A (Appendix C).

8. Is it common for dietary supplements, particularly weight-loss supplements, to be inadequately labeled (i.e. leaving out certain ingredients)?

Question # 8 was put in to show any inadequacies that labeling dietary supplements has. This is important and consumers need to know what they’re taking and how the supplement can affect his or hers lifestyle.

- John Headding: N/A (Appendix A).
- Susan Swadener: “Sure, many times the supplements contain too little or too high amounts of the active ingredient” (Appendix B).
- Debby Nicklas: N/A (Appendix C).

Dietary Supplement Research Questions

For this study, the following six research questions were created to determine to current marketing strategies used by pharmaceutical companies towards dietary supplement consumers, consumer knowledge of the regulation of dietary supplements, and the supplement-drug interaction in the human body.

Research question 1: What is the effect of public relations on how pharmaceutical companies readily gain long-lasting relationships with consumers?

- “Building a sustainable brand is critical in the pharmaceutical industry because of the enormous investment in research and development” (PR News, 2002).
- “Producers often communicate with consumers through labels and other forms of advertising. If the content is accurate and understood, such communications can help consumers make choices in their own best interest...agencies must consider the realities of consumer decision making, namely, how consumers understand a communication’s contents and apply them to their personal circumstances” (Eggers et al., 2004).

Research question 2: How are current marketing strategies affecting consumers’ lifestyles?

- Bolton et al. states that remedy messages lead consumers to “perceive the remedy as a ‘get out of jail free’ card that takes the risk out of risky behavior, thereby encouraging it (i.e. a boomerang effect of the remedy message opposite to the position intended)” (p.714).
- “In the regulatory world, the strategy of targeting information-sensitive consumers is commonly accepted among policymakers and scholars due to the positive externalities that should indirectly benefit non-information-seeking consumers. The information-sensitive segment is presumed to play a market-perfecting role in stimulating positive seller responses upon which other segments may free ride” (Mason et al., 2011).

Research question 3: Do current marketing strategies effectively communicate the risks and uses of dietary supplements?

- “The probiotic community...expressed a need to better understand U.S. regulatory agency expectations of marketers of probiotic products with regard to what types of information would constitute adequate substantiation of claims on probiotic products” (Sanders et al., 2011).
- “The concern is that consumers may not differentiate between technical descriptions and marketing language and may attempt to use dietary supplements in place of medicines that have been tested in rigorous trials” (Denham, 2011).
- “Until a more systematic wide-reaching strategy is adopted, physicians need to assume an active role in educating their patients about the lack of governmental involvement in both the premarket evaluation of supplements and the pre-approval of their advertisements. These efforts would assist patients in making well-informed choices rather than ones based on marketing propaganda” (Ashar et al., 2007).

Research question 4: What is the level of understanding consumers have on the regulations of dietary supplements?

- “In bivariate analysis, a lower level of education, non-Caucasian race, perception of being underweight or of normal weight, and having never tried to lose weight were all associated with being inadequately informed that the FDA does not approve dietary supplements” (Ashar et al., 2007).

- “One brand of Echinacea is labeled this way: ‘Echinacea is the world’s best known herb for *nutritionally supporting defense system functions.*’ Elsewhere on the package, it says that the product ‘maintains healthy immune functions.’ Consumers effortlessly interpret these statements to mean that the product will help them fight off a nasty virus” (Nichter et al., 2006, p.177).
- “...individuals do not understand the broader implications of the DSHEA. As a result, when consumers make decisions about whether to use a dietary supplement, they may do so with inaccurate or incomplete information” (Dodge et al., 2011, p. 236-237).

Research question 5: How do prescription drugs interact with the effects of dietary supplements?

- “Natural products can ‘interact’ with drugs by affecting the biological processes that regulate their metabolism and elimination. Cytochrome P450 is the system of enzymes that are abundantly involved in the metabolism of many drugs” (Joshi et al., 2008).
- “The intestinal CYP450 3A4 appears to be subjected to a mechanism-based inactivation by compounds present in grapefruit juice [GFJ]” (De Castro et al., 2006).
- “Basically the nature of herb-drug interaction is not a chemical interaction between the drug and the herb component to produce a toxic effect. Instead, the interaction may involve an herb component causing either an increase or decrease in the amount of drug in the blood stream” (Joshi et al., 2008).

Research question 6: The compound naringin is found in many dietary supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and medicines?

- “Among GFJ components, the flavonoids naringin, naringenin,...have been suggested to contribute to GFJ-drug interaction” (De Castro, 2006).
- “Co-administration of grapefruit juice and/or purified bioactive compounds may inhibit CYP 3A4 and transporter proteins partially or fully. This type of strategy may reduce the dose of drugs and lead to a reduction in the cost of expensive medications by means of decreasing the first-pass metabolism” (Girenavar, Jayaprakasha, Jifon, and Patil, 2007, p.1274).
- “Manufacturers need to be more aware of the risk to the company, as well as to the public, of failing to provide adequate warning and they need to put in place mechanisms for earlier awareness of such risks and for ways to deal with them” (Joshi et al., 2008).

Dietary Supplement Data

For this study, three experts were asked identical questions to gain more in-depth knowledge about the effects that dietary supplements can have in conjunction with prescription medication as well as the effects of public relations on the marketing strategies of pharmaceutical companies. John Heading, Dr. Susan Swadener, and Debby Nicklas were interviewed for their expertise in the areas of pharmacology, dietary needs, and public relations, respectively. The following tables demonstrate the respondents’ answers in relation to the six original research questions.

Research question 1: What is the effect of public relations on how pharmaceutical companies readily gain long-lasting relationships with consumers?

This question was designed to gain insight to the public relations tactics being used today. These tactics represent how relationships with consumers have developed or wilted as a result of the execution of the tactics. From the literature, a sustainable brand and accurate labeling on the products will gain consumer trust which leads to the formation of a relationship. Table 1 shows similar answers between the three experts: public relations is a key to the progression of a long-lasting relationship.

Table 1

The Effect of Public Relations

Respondent	Relationships are created through...	Tactics
John Headding	Educated pharmacists and physicians	Direct-to-consumer marketing
Susan Swadener	Strategic marketing	Commercials, ads, websites, and free samples
Debby Nicklas	Good public relations	Testimonials and personal consumer experiences

Research question 2: How are current marketing strategies affecting consumers' lifestyles?

Marketing and advertising can affect the consumer's lifestyle. At the same time, the way consumers go about day-to-day business affects how marketing strategies are created. This question is meant to expand on how current marketing strategies are affecting the way consumers

live, either positively or negatively. From the literature, a “boomerang effect” occurs when consumers take a remedy message as a ‘get out of jail free card’, and similar effects were found in many studies. This question will lead the reader into finding gaps in current strategies and realizing there is need for change.

In Table 2, there were slight differences between the three experts. On the positive side, the experts’ responses were similar. Negatively, Susan Swadener and John heading agreed. These differences can be attributed to each expert’s field of study. The three responses covered parts of the question that were not directly discussed.

Table 2

Effects of Current Marketing on Consumers’ Lifestyles

Respondent	Positive Effect	Negative Effect
John Headding	Increased disease awareness and education	Short consultations with physicians lead to unneeded use of drugs
Susan Swadener	Increased consumer education	Consumer may not need the supplement at all
Debby Nicklas	Marketing is more geared towards creating a positive way of life	Strategies are more adapting to an older population

Research question 3: Do current marketing strategies effectively communicate the risks and uses of dietary supplements?

This question is meant to dig deeper into how current marketing strategies are providing consumers with the needed information about dietary supplements and the risks of taking supplements with prescription medication. The literature suggested that tighter regulation by a governmental agency was needed. This regulation would put pharmaceutical companies in a position to release information (labeling) that was accurate and backed by scientific evidence. If tighter regulation is out of reach, physicians and other educated professionals should actively educate consumers (providing a place to seek advice).

Table 3 presents the experts responses as being similar. There was uncertainty with how marketing strategies have effectively communicated to consumers. John Headding’s response states that educated physicians and pharmacists should handle questions regarding dietary supplements. Health food store associates may not be as qualified as physicians to handle a patient’s supplement and drug intake.

Table 3

Risk and Use Communication of Dietary Supplements

Respondent	Effectiveness	Improvements
John Headding	Both good and bad; more people recognize risks, but public may be seeking advice from uneducated sources	Tighter regulations on supplement marketing and improve physician-consumer relationship
Susan Swadener	Not aware of marketing’s effectiveness	Mention medications that produce adverse side effects when taken with supplements
Debby Nicklas	Not sure, as a consumer, whether it’s good or bad	Not sure, as a consumer

Research question 4: What is the level of understanding consumers have on the regulations of dietary supplements?

By understanding consumer knowledge, pharmaceutical companies can better gauge the measures that must be taken to improve on educating consumers (in areas that have gaps). This question provides the basis to which the reader can trace to changes that should be taken. From the literature, consumers are not aware that there are no regulations on supplements. Certain factors contribute to consumer awareness, education, race, and those who have never tried to lose weight (or gain interest in taking supplements). These factors result in risks pharmaceutical companies take when availability of the background of supplements is presented in a manner that consumers do not understand. The language on the labeling may be unfamiliar to the consumer, and he or she may not research the product any further than what's shown on advertisements or on the label.

The contents of Table 4 confirm that there are few measures being taken to educate the consumer. John Headding and Susan Swadener have similar answers, while Debby Nicklas was not able to respond to the question. The level of understanding pertains to the general public, not the experts themselves. The table allows the reader to clarify the research with expert opinions.

Table 4

Knowledge of Dietary Supplement Regulation

Respondent	Consumer Level of Understanding	Improvements
John Headding	Moderate	Increase measurements on consumers education
Susan Swadener	Minimal	Increase communication with registered dietitians and place regulations on the label
Debby Nicklas	N/A	N/A

Research question 5: How do prescription drugs interact with the effects of dietary supplements?

The scientific background to the drug-supplement interaction is important to creating marketing strategies that promote a safe and healthy consumer lifestyle. Many prescription drugs interact with dietary supplements, and consumers should be aware of any interaction if he or she is taking medication along with supplements. The current literature describes drug-supplement interaction by increasing the amount of the medication in the blood stream. This increase into the blood stream can create adverse side effects from the drug. Drug-supplement interaction should have precautions and availability of research for the consumer. Table 5 provides confirmation of the current literature.

Table 5

Supplement Interaction with Medication

Respondent	Level of Interaction with Drugs	Physician Awareness	Example of Drug
John Headding	Every product that's over-the-counter has an interaction with a medication (there's a range of interaction)	Supplements are commonly suggested	Not sure
Susan Swadener	Common, many interact with at least one medication	Supplements are readily suggested, if proven effective; asks clients if he or she is taking a supplement	Tryptophan and St. John's Wort
Debby Nicklas	N/A	N/A	N/A

Research question 6: The compound naringin is found in many dietary supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and medicines?

This question was designed to focus the reader's attention on the delimitation of naringin and specifically, weight-loss supplements. By focusing on supplements containing naringin and consumers using or have taken weight loss supplements, it narrows the audience and area of study. By presenting how naringin interacts with certain prescription drugs, similar drug-supplement interactions can be handled in a similar manner (through marketing strategies and public relations).

From the literature, the flavonoid naringin has been found to contribute to the inhibition of a drug-metabolizing cytochrome P450 3A4. This inhibition has a major effect on how certain drugs can be taken, especially if naringin is a compound found in the supplement the consumer is taking. Table 6 presents expert responses of how marketing strategies adapt to drug-supplement interaction. The answers were similar and Susan Swadener suggested an improvement to current strategies.

Table 6

Effects of Naringin

Respondent	Effects of Naringin	Quality of Labeling
John Headding	The FDA has the ability to pull a product if there are too many problems	N/A
Susan Swadener	Consumers should know that naringin can decrease the metabolism of certain drugs which can lead to toxic levels in the blood stream	Can be inadequate; supplements may contain too little or too high amounts of the active ingredient
Debby Nicklas	N/A	N/A

Chapter 5

Discussion and Recommendations

Summary

This study was performed to gain additional knowledge about the complexities of marketing strategies and public relations in the pharmaceutical industry. With personal experience working with the compound naringin, it was with a fascination to narrow the focus of the study to the effects of naringin on prescription medication. The scientific background of dietary supplements is essential to successfully developing a marketing strategy or public relations plan. The level of knowledge that consumers have of the science behind supplements, was shown to be minimal.

With many studies portraying the low level of consumer knowledge about regulations on supplements and drug-supplement interaction should concern many physicians, pharmacists, dietitians, and pharmaceutical companies. The well-being of the consumer rests in the consumer's own ability to delve into research regarding a supplement he or she has been taking or is interested in taking. Though some consumers will research the science, many are unable to access such information. Here, health professionals should step in and assume the active role in educating consumers.

To find more information on current marketing strategies and general knowledge about dietary supplements, an expert from each field (pharmacology, dietary needs, and public relations) was interviewed with a questionnaire designed to answer the six original research questions for the study:

1. What is the effect of public relations on how pharmaceutical companies readily gain long-lasting relationships with consumers?

2. How are current marketing strategies affecting consumers' lifestyles?
3. Do current marketing strategies effectively communicate the risks and uses of dietary supplements?
4. What is the level of understanding consumers have on the regulations of dietary supplements?
5. How do prescription drugs interact with the effects of dietary supplements?
6. The compound naringin is found in many dietary supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and medicines?

The six research questions were modified for the questionnaire. The altered questions were designed to allow each respondent to relate to the content of the study, while still retaining knowledge from the expert's field of study. The responses from the questionnaire were tied into the current literature on the effects of public relations on the marketing of dietary supplements.

Discussion

With the collected data from Chapter 4, conclusions were drawn and tied into the current literature discussed in Chapter 2. These conclusions are shown in relation to the six original research questions.

Research question 1: What is the effect of public relations on how pharmaceutical companies readily gain long-lasting relationships with consumers?

All three experts had similar positive responses. Dr. Susan Swadener gave examples

of tactics including free samples, commercials, and advertisements. John Headding found both a positive and negative side to marketing strategies. Debby Nicklas found that testimonials were a good public relations tactic. These responses show that public relations tactics cover a variety of areas. The three experts differed in how long-lasting relationships were created: good public relations, educated physicians and pharmacists, and strategic marketing.

The literature reflected a similar standpoint. Accuracy of marketing affects “how consumers understand a communication’s contents and apply them to their personal circumstances” (Eggers et al., 2004). This accuracy alongside consumers seeking advice from educated health professionals, will allow a long-lasting relationship to grow. John Headding described how pharmaceutical companies can place a product on a news venue, and as a result consumers will ask physicians about the advertised product. This is a form of direct-to-consumer advertising.

Overall, long-lasting relationships with consumers exist if there is accuracy in marketing and tactics are being used. Educated health professionals play an important role in the way consumers are affected by supplement marketing strategies.

Research question 2: How are current marketing strategies affecting consumers’ lifestyles?

Generally, the three experts viewed current marketing strategies as increasing consumer awareness. According to John Headding, “more people are aware of disease states and becoming educated, and more people are getting vaccinated”. The experts also agreed that marketing strategies were adapting to consumers’ changing lifestyles. By appealing to the consumer’s need to stay young and with no time to eat right, pharmaceutical companies are modifying public relations to be more relatable to the consumer.

The literature suggests that negative effects of drug and supplement marketing are happening frequently. Bolton et al. pointed out that “there is less opportunity for one-on-one patient education with over-the-counter versus prescription drugs” (2007, p. 718). This point poses a threat for consumers creating a healthy lifestyle from the current marketing strategies. “Misleading advertising can lead to improper public consumption of potentially toxic supplements” (Ashar et al., 2007). The literature finds that supplement marketing can be harmful or helpful depending on the audience involved.

Overall, the literature and experts disagreed and agreed in areas. Both agreed that marketing strategies were adapting to consumer lifestyles, but the experts found that there could be both a positive and negative effect on consumers. From the literature and experts, it proposes that supplement marketing can only be effective if the correct audience is targeted and the audience is educated enough to understand and respond cautiously to the marketing.

Research question 3: Do current marketing strategies effectively communicate the risks and uses of dietary supplements?

Dr. Susan Swadener and Debby Nicklas were uncertain about whether the risks and uses were effectively being communicated through supplement marketing. John Headding put a positive and negative side to the strategies. As the negative, he asserts that “health food stores aren’t qualified to address a patient’s health; it is detrimental for consumers”. Health professionals should be the only source of advice after consumers view a supplement advertisement.

The literature places an active role on physicians and health professionals to compensate for the technical language that many advertisements can contain about supplements. Consumers

should have “a better understanding of appropriate uses of conventional foods or supplements for targets affected by probiotics” (Sanders et al., 2011, p. E2). The regulations of supplements were not observed in the amount of education consumers had. Increased consumer education about the risks and uses of supplements is needed.

Overall, there were similarities about and increase in FDA regulation on the language used on labels as well as greater consumer awareness about the regulations that supplements have.

Research question 4: What is the level of understanding consumers have on the regulations of dietary supplements?

Debby Nicklas was not applicable to answer this question. Dr. Susan Swadener was unsure and unaware that pharmaceutical companies were educating consumers as well as consumers’ level of understating of supplement regulations. According to John Headding, pharmaceutical companies “haven’t done a good job, there’s a limited amount of information made available for consumers”. Consumers’ understanding of supplement regulations is minimal.

A low level of consumer understanding of supplement regulations was observed in the literature as well. Factors that contributed to this low level include: “a lower level of education, non-Caucasian race, perception of being underweight or of normal weight, and having never tried to lose weight” (Ashar et al., 2007, p. 25). Dr. Susan Swadener suggested that the regulations should be placed on the label of each supplement product.

Overall, the experts’ opinions and the literature provided similar answers. Consumer knowledge of supplement regulation is marginal, and there should be an increase in FDA

involvement in educating consumers. The uncertainty of Dr. Susan Swadener and Debby Nicklas shows that experts, as consumers, are unaware of measures being taken to inform consumers of supplement regulations as well as the level of consumer understanding on the topic.

Research question 5: How do prescription drugs interact with the effects of dietary supplements?

Debby Nicklas was not applicable to answer this question. John Headding stated that “literally every product that’s over-the-counter has an interaction with some drug”. Dr. Susan Swadener gave two examples of supplements that interact with drugs: St. John’s Wort and Tryptophan.

The literature described the scientific background of how supplements interact with prescription medication, and how consumers can be at risk if there is no awareness of the interaction. “The interaction may involve an herb component causing either an increase or decrease in the amount of drug in the blood stream” (Joshi et al., 2008). This interaction can produce adverse side effects if the consumer is not educated about drug-supplement interactions.

Overall, the literature provided the scientific background to the drug-supplement interaction, while the experts brought information regarding how great of an effect drug-supplement interaction can have on health professional awareness. Without physician or a health professional’s awareness, some consumers can be unaware of the adverse effects that supplements can have with drugs.

Research question 6: The compound naringin is found in many dietary supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and medicines?

Debby Nicklas was not applicable to answer this question. If naringin can produce adverse side effects through its interaction with a supplement, in a large number of people, “the FDA steps in and has the ability to pull it from the shelf or ban it completely”, according to John Headding. The effects of naringin should be made available to consumers with newly released drugs have the ability to interact with a supplement containing naringin.

Consumer awareness of drug-supplement interactions raises concerns when many people are not educated enough to understand its scientific background. “Actually, herbal medicines either mimic, or increase, or decrease the action of prescribed drugs. This can be especially important for drugs with narrow therapeutic windows and in sensitive patient populations such as older adults, the chronically ill, and those with comprised immune systems” (Joshi et al., 2008). The literature showed that the scientific background of drug-supplement interaction is essential to creating successful marketing strategies.

Overall, both the literature and the experts were concerned about consumer awareness of drug-supplement interactions. The literature took a deeper look into how the interaction occurs in the human body, and the experts provided insight into the level of professional awareness of drug-supplement interactions.

Recommendations for Practice

After completion of the study, the expert knowledge and literature research was analyzed and compared on the topic of public relations and its effects on marketing towards dietary

supplement consumers. Given the information from the collected research, it is imperative that the main points of the study are addressed to inform future public relations, pharmacology, pharmaceutical companies, and dietary needs professionals. Recommendations for practice include increasing consumer awareness about the regulations, risks, and uses of dietary supplements; making essential information about drug-supplement interactions available to health professionals and consumers; lobbying for tighter FDA regulations of the language written on supplement labels; and pushing pharmaceutical companies towards self-regulation of released advertisements (ensuring accuracy and legitimacy).

Increase Consumer Awareness.

Consumers are essential to a pharmaceutical company's revenue and popularity among communities. A consumer's trust in a brand can affect the longevity of the relationship with the pharmaceutical company. To increase consumer awareness, and in turn the consumer's trust, companies should use tools such as Internet websites (to display clear and concise information on dietary supplement use, risks, and regulations) and make pamphlets available at medical centers displaying essential supplement information (contacts and websites to visit). Health professionals can also increase awareness by addressing issues in physician-patient consultations.

The results of consumer relationships can be influential on pharmaceutical companies and health professionals. "Information disclosure has become the preferred consumer protection remedy advocated by economists, the courts, regulators, and business" (Mason et al., 2011). By actively providing consumers with tools to educate themselves on the risks, uses, and regulations of dietary supplements, companies are more likely to achieve a long-lasting relationship with the consumer.

Increase Health Professional Awareness.

Health professionals include pharmacists, dietitians, and physicians. These areas of expertise provide a safe haven for consumers when he or she becomes uncertain about a condition, drug, or supplement. Debby Nicklas was unable to answer five of the eight interview questions, due to her qualification and awareness of dietary supplement knowledge. This adds to the urgency that falls on producing greater health professional awareness. Increasing health professional awareness about drug-supplement interactions makes these professions more educated and able to answer questions consumers can bring into conversation. Similar tools can be used to increase professional awareness that can be used to increase consumer awareness: pamphlets in medical centers and Internet websites (to display clear and concise information on drug-supplement interaction. Health professional conferences about dietary supplements can also help to generate awareness.

John Headding provided insight to pharmacist awareness on supplements, and explained that many health professionals must do outside research into dietary supplement information (relatable to the patient). The information is not readily provided to professionals in textbooks. Generating professional awareness by using a variety of tools will allow for consumers to seek advice from better educated sources. This can in turn affect the public relations of pharmaceutical companies and how marketing strategies are created to reach to consumers.

Tighter Regulations on Labels.

The label of dietary supplements has the ability to hold many important points about the ingredients, uses, and risks. As many supplement consumers come from a variety of backgrounds, companies cannot be sure that each consumer reads the label the same way. The

technical language of the science behind supplements can be misread by consumers with no medical background.

The claims that exist on labels may have been done through an advertising process or with the basis of proven research. In a study conducted on the compliance of supplement labeling with regulatory standards, 65 percent of noncompliant products had the main issue of “having no or incomplete disclaimer with a structural/functional claim” (Meer et al., 2004). This large percent and with the increasing amount of consumers using supplements, it is crucial that tighter regulations on supplement labeling exist. This will ensure that consumers without a medical background can correctly and safely use a product without misreading the label information.

Pushing Self-Regulation.

Marketing strategies for pharmaceutical companies can at times get carried away with increasing revenue, without thinking about consumer wellness. The little regulation that supplements have, leaves room for improvisation and also inaccuracy. Self-regulation is a step in the direction of enhancing consumer safety and being able to be associated with responsibility.

Formally, there are no measurements that the government takes on a supplement prior to market release. Dr. Susan Swadener suggested that consumers “talk to registered dietitians and look on the FDA website” for answers to questions. These methods can be effective, but can also be harmful to consumers if he or she has no knowledge of what to look for. Pharmaceutical companies should take the necessary actions to self-regulate each other in the area of dietary supplements. This assertion will bode well with consumer trust and creating long-lasting consumer relationships.

Study Conclusion

The general findings from this study have shown that further investigation needs to be performed with regards to the amount of knowledge consumers have on dietary supplements. This knowledge will aid public relations and marketing officials in successful strategies to develop trust and long-term relationships with consumers. Customary data should be collected to learn what knowledge consumers have on dietary supplements as well as the effectiveness that marketing strategies and public relations have on the awareness of supplement uses and risks. With the variety of backgrounds, it is difficult to reach out to each consumer by means of dispatching necessary supplement information. As a result, this study is meant to provide attention to the problems and solutions that are and can be associated with the marketing and public relations of dietary supplements. It also serves as an educational guide for many consumers who seek additional knowledge about the science and risks that are associated with dietary supplements. Ultimately, anyone interested in the topic and background of dietary supplements may use it as an in-depth look into the effects that supplements can have on marketing and public relations.

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Appendix A

Interview Transcripts: John Headding

The following interview was conducted to gain expert opinion in the field of pharmacology based on a questionnaire about the effects of public relations on pharmaceutical companies.

Interviewer: Nicole Schmidt
Respondent: Pharmaceutical Store Owner (John Headding)
Date of Interview: 11/30/2011

Interview Transcription:

Nicole Schmidt: “What strategies do public relations officials of pharmaceutical companies use to gain long-lasting relationships with consumers? What aspects of the public relations area are dedicated to retaining these relationships?”

John Headding: “I think that there are three different types of strategies that companies use, one, create relationships with physicians to get into a position where their medications can be prescribed by those physicians, which can create a direct-to-consumer marketing strategy. Two, direct-to-consumer marketing involves going on news venues, and in turn the public can be educated on certain diseases (news stories). This is a very common tool to use now. People will ask for a certain prescription medication based on what they’ve seen on TV or in ads. Three, marketing to the pharmacists directly enables them to be educated about medications in more detail. Companies who provide certain medication will often give discount cards to patients because of the high prices of medications in this economy. An example would be Liptor; you can go online and get a coupon so you’re co-pay is lower.

For the second part, once you get a patent on a medication, the relationship to communicate with the consumer is given to physicians and the education they’ve received.”

NS: “In what ways are current marketing strategies affecting consumers’ lifestyles (positively or negatively)? How are strategies adapting to consumers’ changing lifestyles?”

JH: “There’s a positive and negative to current marketing strategies. The negative is that patients are getting placed on drugs they don’t need. People are seeking drugs from doctors based on ads they’ve seen. Doctors will often acquiesce with patients because of the limited time that is spent with the patient during the monthly or quarterly visit. The positive side involves the fact that more people are aware of disease states and are becoming more educated. More people are getting vaccinated because they are more aware of diseases. An example of that would be Shingles. Utilization of the product has also increased significantly because people are more aware and educated.

There’s also a positive and negative side to the second question. The positive is that you are seeing patients actually improving their overall health, which leads to a more active lifestyle because diseases are being addressed. This is a major part of current marketing strategies. The

negative is that you are also seeing patients being harmed because they take medications they don't necessarily need."

NS: "Do marketing strategies effectively communicate the risks and adverse side effects that dietary supplements can have with prescription medication? If so, in what ways? If not, in what ways could the strategies be improved, and what are the limitations?"

JH: "Through a professional source, absolutely. They are very detailed in informing the public of the adverse side effects. Supplements can have questionable marketing. There is overutilization of over-the-counter health products. But, more people are asking more questions; they recognize the faults in supplement marketing. Through a source that has not gone through medical school and put the time into understanding medications and their interaction with the human body, absolutely not. There are harms and dangers of seeking advice from an uneducated source. It is not effective communication for supplements to be sold without the proper source available for consumers. In general, the public is misinformed. Health food stores aren't qualified, which can be detrimental to the public. It should be left to physicians and pharmacists, people who are educated.

NS: "How do pharmaceutical companies educate consumers about the risks of taking dietary supplements? What measurements are taken to ensure consumers have the right education about regulation on dietary supplements? What improvements can be taken?"

JH: "They haven't done a good job. I think there's a limited amount of information available to consumers about dietary supplements. People are seeking quick fixes in their lives, and supplements can be marketed to appeal to having easy solutions. As a result, people are abusing and misusing products. Currently, there are no measurements being taken to evaluate the amount of education available to consumers. Formally there's nothing, but individual measurements can be taken when people see a physician or pharmacist.

NS: "What dietary supplements are known to interact with certain prescription drugs? How readily are dietary supplements approved by a professional, or suggested by a professional?"

JH: "Literally every product that's over-the-counter has an interaction; there isn't one that doesn't interact. But, there's a range in terms of the interaction. It takes just a qualified conversation with a patient to see if a consumer is taking a dietary supplement that may be harmful to his or hers health. Supplements are commonly suggested to patients. For those professionals that are educated, the concern with health food stores [HFS], especially with over-the-counter marketing, is that people will seek advice from HFS which can be potentially harmful to a patient's health. There is no opportunity to interact with someone to evaluate if they are taking prescription medication or what their health conditions are."

NS: "How often are dietary supplements brought to the attention of physicians or a professionals' attention?"

JH: "Rarely ever. Physicians usually have to ask if a patient is taking a supplement. Over-the-counter product information is not often available to physicians through textbooks. Physicians

have to seek out the information themselves through outside sources, and there can be good and bad information on the internet.”

NS: “Naringin can be found in many weight-loss supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin effect the marketing strategies of releasing new drugs and supplements?”

JH: “The process occurs through the FDA. When you get a number of problems on a product happening, the FDA steps in and has the power to pull the product from the shelves or ban the product.”

NS: “Is it common for dietary supplements, particularly weight-loss supplements, to be inadequately labeled (i.e. leaving out certain ingredients)?”

JH: N/A

Appendix B

Interview Transcripts: Dr. Susan Swadener

The following interview was conducted to gain expert opinion in the area of dietary needs based on a questionnaire about the effects of public relations on pharmaceutical companies.

Interviewer: Nicole Schmidt
Respondent: Registered Dietitian (Dr. Susan Swadener)
Date of Interview: 11/23/2011

Interview Transcription:

Nicole Schmidt: “What strategies do public relations officials of pharmaceutical companies use to gain long-lasting relationships with consumers? What aspects of the public relations area are dedicated to retaining these relationships?”

Susan Swadener: “[Strategies include] commercials on TV, ads in magazines, websites, and free samples. I don’t know [the area of public relations that retain these relationships].”

NS: “In what ways are current marketing strategies affecting consumers’ lifestyles (positively or negatively)? How are strategies adapting to consumers’ changing lifestyles?”

SS: “Perhaps they are more educated, but also they may not need the supplements at all. [Strategies are adapting to consumers’ changing lifestyles by marketing] that people are too busy to eat right.”

NS: “Do marketing strategies effectively communicate the risks and adverse side effects that dietary supplements can have with prescription medication? If so, in what ways? If not, in what ways could the strategies be improved, and what are the limitations?”

SS: “I am not aware of marketing strategies to communicate risks of drug-supplement interactions. The strategies could be improved by mentioning medications that are contraindicated with the supplement.”

NS: “How do pharmaceutical companies educate consumers about the risks of taking dietary supplements? What measurements are taken to ensure consumers have the right education about regulation on dietary supplements? What improvements can be taken?”

SS: “I don’t know that companies are educating consumers; I am not aware of them doing that. The measurement being taken include talking to registered dietitians and looking for information on the FDA website. The improvements include putting the regulations on the label of the product.”

NS: “What dietary supplements are known to interact with certain prescription drugs? How readily are dietary supplements approved by a professional, or suggested by a professional?”

SS: “Tryptophan and St. John’s Wort are examples of supplements known to interact with prescription drugs. Supplements are readily suggested if proven effective for the patient.”

NS: “How often are dietary supplements brought to the attention of physicians or a professionals’ attention?”

SS: “I always ask my clients if they’re taking dietary supplements, as a registered dietitian.”

NS: “Naringin can be found in many weight-loss supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and supplements?”

SS: “Companies need to tell consumers that it [naringin] can decrease the metabolism of certain drugs and therefore cause toxic levels [to be present in the bloodstream].”

NS: “Is it common for dietary supplements, particularly weight-loss supplements, to be inadequately labeled (i.e. leaving out certain ingredients)?”

SS: “Sure, many times the supplements contain too little or too high amounts of the active ingredient.”

Appendix C

Interview Transcripts: Debby Nicklas

The following interview was conducted to gain expert opinion in the field of public relations based on a questionnaire about the effects of public relations on pharmaceutical companies.

Interviewer: Nicole Schmidt

Respondent: Executive Director of French Hospital Medical Center (Debby Nicklas)

Date of Interview: 12/2/2011

Interview Transcription:

Nicole Schmidt: “What strategies do public relations officials of pharmaceutical companies use to gain long-lasting relationships with consumers? What aspects of the public relations area are dedicated to retaining these relationships?”

Debby Nicklas: “They [companies] must try to generate good PR [public relations] that shows consumers how they’ve helped. This can be through the use of testimonials or personal consumer experiences. Companies also want to try to reach out to physicians, and try to generate good stories of the product. You see a lot of paid advertising as well. Usually, I’m not used to seeing PR for pharmaceutical drugs, and there can be bad reactions towards some.”

NS: “In what ways are current marketing strategies affecting consumers’ lifestyles (positively or negatively)? How are strategies adapting to consumers’ changing lifestyles?”

DN: “I think pharmaceutical companies are trying to push how their products can change your life through advertisements that are happier, more optimistic. Baby boomers are a target audience, the marketing is geared more towards the positive side of the medication (it replaces more hardcore procedures of stating what the product simply does). Companies are playing up the fact that baby boomers want to stay young. The strategies in general, are adapting to the older population, trying to make them feel better about being older and getting you back to being active. This depends on the fact that the world is changing, and family members don’t usually stay near each other, they move away after college or high school. As a result, older members of the community can’t rely on their families to take them to the hospital or get medication for them, they can only rely on themselves.

NS: “Do marketing strategies effectively communicate the risks and adverse side effects that dietary supplements can have with prescription medication? If so, in what ways? If not, in what ways could the strategies be improved, and what are the limitations?”

DN: “I think they [companies] do. They say potential side effects. I don’t know, as a consumer, the marketing dietary supplements have, and whether it’s good or bad.”

NS: “How do pharmaceutical companies educate consumers about the risks of taking dietary supplements? What measurements are taken to ensure consumers have the right education about regulation on dietary supplements? What improvements can be taken?”

DN: N/A

NS: “What dietary supplements are known to interact with certain prescription drugs? How readily are dietary supplements approved by a professional, or suggested by a professional?”

DN: N/A

NS: “How often are dietary supplements brought to the attention of physicians or a professionals’ attention?”

DN: N/A

NS: “Naringin can be found in many weight-loss supplements and is known to interact negatively with certain prescription drugs. How does the presence of naringin affect the marketing strategies of releasing new drugs and supplements?”

DN: N/A

NS: “Is it common for dietary supplements, particularly weight-loss supplements, to be inadequately labeled (i.e. leaving out certain ingredients)?”

DN: N/A