Gendered Marketing of Food Supplements in Lifestyle Magazines in Greece

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Abstract: Background: Marketing of food supplements in Greece in print media has not been examined and this study is the first attempt to provide a comparative statistical analysis.

Methods: Lifestyle magazines that were distributed all over Greece and aimed at women and men were collected in the years 2014 and 2016. Five criteria with their subcriteria were developed and were related to the branding of the food supplements; their quality characteristics; the information given about health concerns; photographs of people who promoted food supplements and to claims of their suitability.

Results: It seems that in terms of product branding, women’s magazines were more likely to be targeted. Some quality characteristics such as information about the ingredients of food supplements or information about banned substances were more likely to be seen in women’s magazines in 2016. In 2014 and 2016, not all advertisements provided information about health concerns and among those which informed readers about health concerns, differentiation in target audiences was observed. Photographs that showed people promoting food supplements as well as claims of suitability for various categories of consumers, seem to be gendered in 2014 but this trend was not strong enough in 2016.

Conclusion: It can be argued that the marketing of food supplements was aggressive and gendered in 2014 and changed in 2016 with better information on public health but had retained some gendered stereotypes.

Keywords: food supplements, marketing, gender, public health, magazines, Greece.

1. INTRODUCTION

The dietary supplements industry is fast growing which leads to an annual average of 1,000 new products and billion dollars annual revenue [1]. The market for herbs and dietary supplements in the USA is estimated to have a value of $62 billion, and the World Health Organization predicts that by 2050, the value will increase to $5 trillion [2]. Adults are considered to be the largest consumer group in food supplements in Europe and they suffer from various health disorders such as blood pressure, obesity, diabetes; therefore, there exists the need for supplements [3].

The European Union Directive on Food Supplements (2002/46/EC) defines food supplements as: “foodstuffs the purpose of which is to supplement the normal diet and which are concentrated sources of nutrients or other substances with a nutritional or physiological effect, alone or in combination, marketed in dose form, namely forms such as capsules, pastilles, tablets, pills and other similar forms, sachets of powder, ampoules of liquids, drop dispensing bottles, and other similar forms of liquids and powders designed to be taken in measured small unit quantities” [4].

The market size of nutrition and supplements in Europe was valued at USD 31.7 billion in 2016. That year, Italy, Germany, and France were among the key markets with approximately 40.0% share [3]. Greece is at the lowest level in terms of use of dietary supplements and Europe, specifically 2.0% among men and 6.7% among women [5]. Research shows that adequate micronutrient intake is not guaranteed in Greek pregnant women despite the high prevalence of micronutrient supplementation during pregnancy [6]. Adolescents on exercise in Greece consume food supplements, can have easy access to contaminated food supplements and have a low level of awareness about them [7].

Recommended micronutrient intakes among children and adults in Greece were examined, taking into account the role of age, sex, and socioeconomic status [8]. Regarding age and sex differences, the highest frequency of inadequate nutrient intakes occurs in postmenopausal women. In all age groups and both sexes, the intake of vitamin D reached 100% below the estimated average requirement. In addition, nutrient intakes below the estimated average requirement were found
for calcium and magnesium in postmenopausal women, vitamin E in all age groups and folate in women. With respect to differences in socioeconomic status, inadequate calcium and vitamin C intakes were higher for children and postmenopausal women of lower socioeconomic status compared to their higher socioeconomic status counterparts. Both the sexes, all age groups, and all social-economic status groups were reported to have inadequate intakes for calcium, folate, vitamin E and vitamin D [8].

Marketers of food supplements have quickly filled consumers’ demand for “dietary heaven” [9]. The marketing of dietary supplements seeks to maximize profit and sales than improving the health of consumers. A huge number of consumers prefer dietary supplements due to marketing but they do not pay attention to safety issues and efficacy [9]. A scientific ranking system is desired by consumers in order to be able to evaluate the validity of dietary supplements' labeling [10].

This study aims at analyzing how food supplements are labeled and marketed in lifestyle magazines in Greece. Criteria with their subcriteria were developed and were based on the study of Gabriels and Lambert [11] and on the recommendations of Gilbert [12] with adjustments to the Greek market. Lifestyle magazines which were distributed all over Greece and aimed at women and men were collected of the years 2014 and 2016.

2. MARKETING OF FOOD SUPPLEMENTS TO CONSUMERS

Marketing of food supplements in the EU depends on national legislation which differs among the member states. Countries have different processes of regulatory control and vary in the extent to which products are regulated. Moreover, the legal status of some botanicals differs from one EU country to another as they may be used as food supplements in one country and as a medicinal product in another [13]. Therefore a complex market environment exists because of the legal status of plant food supplements and herbal medicinal products which is one of the main obstacles to the marketing of plant food supplements in the EU [13]. In the Greek market, a notification file has to be deposited to the National Organization for Medicines for every new brand of nutritional supplement with appropriate labeling on the product in the Greek language [7]. Moreover, the general population in Greece is prohibited to use and possess doping substances without medical prescription under Hellenic Law 2725/1999 as amended and in force [7].

Nowadays, consumers are familiar with food marketing and food labeling and often trust blindly all the information given on the label. In the USA, the FDA regulates the labeling information found on the back of all packaged foods. Because of the growth of websites, social media and many other uses of technology, FDA attempted to expand the concept of food labeling apart from traditional product packaging. For example, food labeling should include contact details of the manufacturer and distributor company and any violation of misbranding. The misbranding provisions identify areas of noncompliance over premarket requirements. Imported products raise particular labeling problems because the products often bear labels compliant with the country of origin [14].

Consumers can easily find access to food supplements through online markets either by websites or by social networking sites, but the information provided is doubtful. As there is a high demand for food supplements in the USA, customers may avoid health professionals as a source of information and visit websites for help. In the USA, registered dietitians and dietetic technicians can provide information about federal websites and commercial websites that provide accurate and helpful information on dietary supplements [15].

Website content was evaluated for the quality of information available to consumers as well as for the presence of a complete list of ingredients in supplements for diabetes suggested on websites [16]. The results showed that 50% of the website had a Food and Drug Administration disclaimer and 40% declared clearly that the food supplements offered were not substitutes for proper medication. In general, adequate medical information was lacking. Although food supplements do not require Food and Drug Administration approval of their safety and efficacy, misleading information on websites could lead to improper prevention both in people with diabetes and healthy people [16].

How consumers of nutritional supplement products acquire information to support their purchasing decisions was studied by Gabriels and Lambert [11]. The main finding of their study was that nearly 70% of consumers were strongly influenced by information labeled on the container which stipulated that the nutritional supplement product was free of banned substances. Also, the study showed that over 50% of the consumers paid attention to the quality of the nutritional supplement product information on the container label. About 40% of the consumers were strongly influenced by the ingredients mentioned on the labels when they purchased food supplements. Shortcomings in labeling information practices were identified and attention to the labeling of food supplements was recommended as they could have negative consequences to consumers [11].

3. GENDER AND FOOD SUPPLEMENTS

Modern societies are faced with the paradox: despite the abundant food supply, many Western women desire to restrict food intake [17]. Another dilemma women face is that on one hand, they should protect their families’ health by ensuring proper food but on the other hand, they must be attractive to their husbands by being slim and dressed fashionably [17]. Anxieties about weight have been noticed in higher socioeconomic groups. High-status young women are aware of the important positive evaluation from others in order to maintain their self-esteem [17].

Consumption of dietary supplements during pregnancy has been studied [18]. Women from lower socioeconomic classes were less likely to consume dietary supplements during pregnancy. Even folic acid supplementation at the beginning of pregnancy was inadequate in the well-educated population. Consumption of dietary supplements during pregnancy, pre- and post-consumption is affected by demographic and socioeconomic disparities [18]. Men and women seem to have a similar frequency in consuming dietary supplements with the exception of larger proportions of iron in women, and a larger proportion of protein, creatine and vitamin E in men [19].
A cross-sectional study in the USA that examined health disparities and advertising content of women's magazines concluded that readers of African American and Hispanic magazines were exposed to proportionally fewer health-promoting advertisements and more health diminishing advertisements [20]. Photographs of African-American role models were more often used to advertise products with a negative health impact than a positive health impact compared to Caucasian role models. In mainstream magazines, white faces were observed frequently in positive health-related advertisements. Health information disparities in the advertising content of women's magazines may be a reason for health disparities among women of different ethnic communities [20].

A content analysis of the dietary content advice given in Men's Health magazine for masculinity, leanness and weight control has been carried out [21]. Magazines' content supported the alpha male and hegemonic masculinity through its emphasis on the desirability of masculinity and leanness. Diet advice was offered by a strong pseudo-scientific discourse. Slimming diets were promoted because of the emphasis given to attain mesomorphic body image. It was a frequent advice to increase calorie and protein intake to enlarge muscle mass. Also, the anabolic diet was advised in various ways such as consumption of traditional protein foods or sports foods which reproduced muscle magazines' support for food supplements. The advice was also given for muscle building from consuming plant food micronutrients and phytochemicals. There was an emphasis on fat burning, consuming good fats and consumption of single foods with fairly little mention of dietary limits [21].

Health policies, in order to achieve the highest health standards, have to recognize that women and men because of the biological differences and their gender roles have different needs opportunities and obstacles [22]. Gender differences in adolescent health and health-related behavior across Europe and North America have been studied by the HBSC survey [22]. Results showed that gender socialization is the process by which girls and boys learn feminine and masculine identities. Gender socialization along with societal expectations are the factors that reflect gender-specific social relationships. Girls' networks and friendships are based on personal communication while the boy's social networks are based on activities related to sports and physical activities. Girls' self-esteem remains strongly related to body image; girls eat fruit and vegetables more often, they tend to engage in weight-reduction strategies and perform less physical activities. Boys use alcohol and cannabis more often, are involved in physical fights and bullying more frequently. Peers' electronic media contact reinforces existing relationships. These health-compromising behaviors can be considered gendered and the health promotion strategies should take these into account [22].

4. STUDY METHODS

This study aims to analyse how food supplements are promoted and labeled in lifestyle magazines that target women and men. For the purposes of this study, five criteria with subcategories were developed which were based on the study of Gabriels and Lambert [11] and on the recommendations of Gilbert [12] with adjustments to the Greek market. The five criteria are related to the branding of the food supplements; their quality characteristics; the information given about health concerns; photographs of people who promoted food supplements and claims of their suitability. The five criteria consisted of various subcriteria each, which summed to 35 subcriteria in total (Table 1).

The study of Gabriels and Lambert [11] examined how consumers of food supplements acquire information about the products which assist their purchasing decisions. Information may be acquired by the container label; specifically brand name in the label; ingredients; recommended dosage and directions for use; claims; disclaimers and warnings; quality of the product; and product free of banned substances. Moreover, other factors which influence consumers positively or negatively to purchase food supplements can be found not in labels but from coaches; fitness trainers; fellow athletes; doctors; pharmacists; dieticians; nutritionists; representatives of food supplements; the internet and print/electronic/social media [11].

Developers and marketers of functional foods should take into account some key rules suggested by Gilbert [12] and some of which were applied as criteria in this paper. Functional foods should have good taste in order to appeal to the majority of consumers. They should be simple as the customers who will purchase them seek an easy way to take care of their health. Customers should also feel familiar to such products and their benefits. Information about their benefits should be given in positive messages. Citation of third-party experts could be provided as customers would feel that there is interest in their health. Furthermore, customers should be informed about the specific characteristics of the product, which would improve their health and not general information. Functional food should provide benefits with little or no risk and the benefits should be visually demonstrated to consumers. There should be a comparison with substitute indicators to measure risk and finally, functional foods should be occasion-oriented [12].

Lifestyle magazines for women and men were collected in 2014 and 2016. The magazines collected were those published each month; weekly magazines were excluded. The selection of the magazines was based on their distribution across Greece, i.e. if they were sold all over Greece. For the purposes of this study, all advertisements and recommendations to food supplements were counted which were identified in the magazines and in some extra sponsored leaflets given together with some magazines (excluding non-commercial articles). References of food supplements as seen in one-page advertisements, back covers, fitness articles, beauty promotions, healthy living tips, commercial articles, advertisements section, and some leaflets given together with magazines were counted.

Magazines for women and men were collected over a six-month period in 2014. Specifically, the collection of the magazines was carried out randomly; it started in April 2014 and ended in September 2014. With regard to women’s magazines, seven lifestyle and fashion monthly publications were collected. The collected men’s magazines comprised three monthly lifestyle and entertainment publications. In total, 40 women’s magazines were collected (as 1 magazine started its publication for the first time on May 2014) and 16 men’s magazines (as for August and September 1 issue was published).
Table 1. Food supplements’ promotion in lifestyle magazines.

<table>
<thead>
<tr>
<th>Criteria Related to the Branding of the Nutritional Supplement</th>
<th>Criteria Related to the Quality Characteristics of the Nutritional Supplement</th>
<th>Criteria Related to Information Given About Health Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand name</td>
<td>Ingredients (herbs, enzymes, vitamins etc.)</td>
<td>National Organization for Medicines notification (The distributor company has taken permission from the National Organization for Medicines in Greece to distribute it)</td>
</tr>
<tr>
<td>Package/container photograph</td>
<td>Free of banned substances</td>
<td>Health benefits claims (references to clinical studies, claims of health benefits to the human body etc.)</td>
</tr>
<tr>
<td>Information and contact details of the distributor company</td>
<td>Nutritional supplement's photograph (pill, tablet, chewy tablet, capsule, liquid, shake liquid, gum, herb, etc.)</td>
<td>Availability only in the pharmacies</td>
</tr>
<tr>
<td>(address, website, social media webpage; QR code, establishment year of the company, subsidiary/affiliated companies)</td>
<td></td>
<td>Recommended dosage and directions for use</td>
</tr>
<tr>
<td>Country of origin</td>
<td></td>
<td>Recommended from health professionals (statements, claims, signed articles)</td>
</tr>
<tr>
<td>Award winning product</td>
<td></td>
<td>Recommended age of consumer</td>
</tr>
<tr>
<td>Claims of best selling product (either in the country of distribution or in the country of origin)</td>
<td></td>
<td>Disclaimers and warnings</td>
</tr>
</tbody>
</table>

Criteria with their subcriteria were developed and were based on the study of Gabriels and Lambert [11] and on the recommendations of Gilbert [12] with adjustments to the Greek market.

Magazines for women and men were collected over a four-month period in 2016. The collection of the magazines started in April 2016 and ended in July 2016. With regard to women’s magazines, seven lifestyle and fashion monthly publications were collected. The collected men’s magazines comprised two lifestyle and entertainment monthly publications. In total, 26 women’s magazines were collected (as for April and May 1 issue was published; for June and July 1 issue was published) and 8 men’s magazines.

The total sample in 2014 included 10 magazines, 56 issues, 9,372 pages and 263 advertisements of food supplements. The majority of advertisements of food supplements appeared in women’s magazines at 74.14% (Fig. 1). The total sample in 2016 included 9 magazines, 34 issues, 6,192 pages and 1,005 advertisements of food supplements, the majority of which appeared in women’s magazines at 90.25% (Fig. 2).

5. RESULTS

5.1. Results from Women’s and Men’s Magazines in 2014

5.1.1. Criteria Related to the Branding of the Nutritional Supplement

Food supplements’ brand name was statistically significant \(\chi^2(1) = 23.661, p = 0.000 < 0.05\); specifically 76.5% was seen in women’s magazines and 23.5% in men’s magazines. Photograph of the package or the container of the nutritional supplement was statistically significant \(\chi^2(1) = 23.661, p = 0.000 < 0.05\); specifically 76.5% of the photographs were seen in women’s magazines and 23.5% in men’s magazines. There was no statistical association between advertisements that stated the name, information and contact details of the company and types of magazines \(\chi^2(1) = 0.782, p = 0.376 > 0.05\); in other words, information about the distributor company was given irrespective of the type of magazine. There was no statistical association between the price of the product and types of magazines \(\chi^2(1) = 0.845, p = 0.358 > 0.05\) either. There was no statistical significance between the country of origin and advertisements in magazines \(\chi^2(1) = 1.869, p = 0.372 < 0.05\). Also, no statistical association was found between advertisements which claimed awarded nutritional supplement and types of magazines \(\chi^2(1) = 1.084, p = 0.298 > 0.05\) and between claims of best selling product and types of magazines \(\chi^2(1) = 0.003, p = 0.957 > 0.05\).

5.1.2. Criteria Related to the Quality Characteristics of the Nutritional Supplement

No association was found between nutritional supplement’s photograph such as capsules or pills and advertisements in magazines \(\chi^2(1) = 2.770, p = 0.096 > 0.05\). Information about the ingredients of the food supplements was not statistically significant \(\chi^2(1) = 0.138, p = 0.710 > 0.05\) either. Claims of being free of banned substances were not
Fig. (1). Frequencies of Food supplements’ Advertisements in 2014 Magazines.

Fig. (2). Frequencies of Food supplements’ Advertisements in 2016 Magazines.
statistically significant in this sample $[\chi^2(1)=0.703, \ p=0.402>0.05]$.

### 5.1.3. Criteria Related to Information Given About Health Concerns

No statistical association was found between notification to National Organisation for Medicines and types of magazines $[\chi^2(1)=1.205, \ p=0.272>0.05]$ neither between health benefit claims and types of magazines $[\chi^2(1)=1.783, \ p=0.182>0.05]$. There was a statistical significance between food supplements’ advertisements that were available only in pharmacies with types of magazines $[\chi^2(1)=4.215, \ p=0.040<0.05]$; specifically 80.5% of the advertisements were seen in women’s magazines and 19.5% in men’s magazines. There was no statistical association between advertisements which stated recommended dosage or directions of use and advertisements $[\chi^2(1)=0.121, \ p=0.728>0.05]$. No statistical association was found between advertisements which claimed that their products were recommended by health professionals and types of magazines $[\chi^2(1)=0.067, \ p=0.796>0.05]$. Statistical significance between the recommended age of consumer and advertisements was not found $[\chi^2(1)=0.028, \ p=0.868>0.05]$. Information about disclaimers and warnings was statistically significant $[\chi^2(1)=4.154, \ p=0.042<0.05]$; specifically 94.4% was observed in women’s magazines and 5.6% in men’s magazines.

### 5.1.4. Criteria Related to Photographs of People Seen to Promote Food Supplements

There was a strong statistical association between woman’s photograph and magazines $[\chi^2(1)=13.423, \ p=0.000<0.05]$. For example, women’s photographs were 97.5% in women’s magazines and 2.5% in men’s magazines. A strong statistical association was found between men’s photograph and magazines $[\chi^2(1)=32.921, \ p=0.000<0.05]$; specifically all men’s photographs were seen only in men’s magazines (100%). Neither children’s photograph nor families’ photographs appeared in any advertisement. Photographs of couple’s appeared to be 56.3% in women’s magazines and 43.8% in men’s magazines which was statistically significant $[\chi^2(1)=6.086, \ p=0.014<0.05]$. There was a strong statistical association between athletes’ photographs in magazines $[\chi^2(1)=10.581, \ p=0.001<0.05]$; for instance, 83.3% of athletes’ photographs appeared in men’s magazines and 16.7% in women’s magazines. None of the nutritional supplements were shown with a picture of an elderly in their advertisement. Neither photographs of women celebrities were found to be statistically significant $[\chi^2(1)=0.350, \ p=0.554>0.05]$ nor of male celebrities and advertisements $[\chi^2(1)=0.613, \ p=0.434>0.05]$.

### 5.1.5. Criteria Related to Claims of Suitability for Various Categories of Consumers

No association was found between food supplements’ advertisements which claimed suitability for both sexes and types of magazines $[\chi^2(1)=0.759, \ p=0.384>0.05]$. There was no statistical association between suitability for women and types of magazines $[\chi^2(1)=1.416, \ p=0.234>0.05]$. There was a strong statistical association between suitability for men and types of magazines $[\chi^2(1)=16.355, \ p=0.000<0.05]$. In particular, 87.5% of the advertisements appeared in men’s magazines and 12.5% in women’s magazines. Neither claims of suitability for elderly were significant $[\chi^2(1)=0.703, \ p=0.402>0.05]$ nor claims of suitability for children $[\chi^2(1)=2.637, \ p=0.104>0.05]$. Advertisements with claims of suitability for athletes were statistically significant $[\chi^2(1)=6.582, \ p=0.010<0.05]$; specifically 50.0% of the advertisements appeared in men’s magazines and 50.0% of the advertisements appeared in women’s magazines. No statistical association was found between advertisements of food supplements that claimed suitability for postmenopausal women and types of magazines $[\chi^2(1)=2.879, \ p=0.090>0.05]$. A statistical association was found between advertisements that claimed suitability for students and types of magazines $[\chi^2(1)=13.105, \ p=0.000<0.05]$; specifically 77.8% of the claims appeared in men’s magazines and 22.2% in women’s magazines. There was a strong association between suitability for all and advertisements in magazines $[\chi^2(1)=15.897, \ p=0.000<0.05]$; specifically 80.0% of the advertisements appeared in men’s magazines and 20.0% in women’s magazines.

### 5.2. Results from Women’s and Men’s Magazines in 2016

#### 5.2.1. Criteria Related to the Branding of the Nutritional Supplement

There was a statistical association between the brand name of the food supplements and types of magazines $[\chi^2(1)=569.673, \ p=0.000<0.05]$; specifically 95.8% of the advertisements which showed brand name of the nutritional supplement were seen in women’s magazines and 4.2% in men’s magazines. A statistical association was found between photographs of the package/container and types of magazines $[\chi^2(1)=558.457, \ p=0.000<0.05]$; specifically 96.1% of the advertisements which showed the package/container of the nutritional supplement were seen in women’s magazines and 3.9% in men’s magazines. Information and contact details of the distributor company were statistically associated with types of magazines $[\chi^2(1)=190.292, \ p=0.000<0.05]$; specifically 96.1% of the advertisements were seen in women’s magazines and 3.9% in men’s magazines.

There was a statistical association between the price of the nutritional supplement and types of magazines $[\chi^2(1)=90.978, \ p=0.000<0.05]$; specifically 99.6% of advertisements were seen in women’s magazines and 0.4% in men’s magazines. Country of origin was statistically significant $[\chi^2(1)=274.329, \ p=0.000<0.05]$ as all advertisements (100%) which gave information about the country of origin were seen in women’s magazines. There was no statistical association between award winning food supplements and types of magazines $[\chi^2(1)=0.871, \ p=0.351>0.05]$. None of the food supplements advertised had claims of best selling product.

#### 5.2.2. Criteria Related to the Quality Characteristics of the Nutritional Supplement

There was no statistical association between photographs of the nutritional supplement and types of magazines $[\chi^2(1)=1.091, \ p=0.296>0.05]$. Ingredients of the nutritional supplement were statistically associated with types of
magazines \( \chi^2(1)=250.559, p=0.000<0.05 \); specifically 97.9\% of the advertisements were seen in women’s magazines and 2.1\% in men’s magazines. Advertisements of food supplements stating that they were free of banned substances were statistically associated with types of magazines \( \chi^2(1)=161.230, p=0.000<0.05 \); specifically 97.1\% were seen in women’s magazines and 2.9\% in men’s magazines.

5.2.3. Criteria Related to Information Given About Health Concerns

There was a statistical association between notification to National Organisation for Medicines and types of magazines \( \chi^2(1)=218.153, p=0.000<0.05 \) as it was seen only in women’s magazines (100\%). No statistical association between health benefits claims and types of magazines was found \( \chi^2(1)=1.143, p=0.285>0.05 \). There was a statistical association between advertisements of food supplements and types of magazines which claimed that they were available only in pharmacies and types of magazines \( \chi^2(1)=411.759, p=0.000<0.05 \); specifically 99.4\% of the advertisements were seen in women’s magazines and 0.6\% in men’s magazines. Recommended dosage/directions for use was statistically significant \( \chi^2(1)=9.316, p=0.002<0.05 \); specifically 80.3\% were seen in women’s magazines and 19.7\% in men’s magazines. Claims that the nutritional supplement was recommended from health professionals were not statistically significant \( \chi^2(1)=1.757, p=0.185>0.05 \). None of the nutritional supplements’ advertisements gave a recommendation on the age of the consumer. Disclaimers and warnings were statistically significant \( \chi^2(1)=50.021, p=0.000<0.05 \); specifically 88.1\% were seen in men’s magazines and 11.9\% in women’s magazines.

5.2.4. Criteria Related to Photographs of People Seen to Promote Food Supplements

There was no statistical association between women’s photographs and types of magazines \( \chi^2(1)=1.091, p=0.296>0.05 \). Photographs of men were statistically related to types of magazines \( \chi^2(1)=74.635, p=0.000<0.05 \) as they were seen only in men’s magazines (100\%). Among the magazines reviewed, no photographs of children in food supplements advertisements were found. No statistical association was found between family’s photographs and types of magazines \( \chi^2(1)=0.871, p=0.351>0.05 \). Couples’ photographs were statistically significant \( \chi^2(1)=93.094, p=0.000<0.05 \); specifically 85.7\% of couples’ photographs were seen in men’s magazines and 14.3\% in women’s magazines. Among the advertisements reviewed, none of them showed a professional athlete to promote food supplements. Also, no advertisement showed photographs of elderly people, celebrity women, or celebrity men.

5.2.5. Criteria Related to Claims of Suitability for Various Categories of Consumers

There was no statistical association between advertisements of food supplements claiming suitability for both sexes and types of magazines \( \chi^2(1)=0.217, p=0.642>0.05 \). Claims about suitability for women were not statistically significant \( \chi^2(1)=0.871, p=0.351>0.05 \). Among the advertisements reviewed, none of them claimed suitability for men. No statistical association was found between suitability for elderly and types of magazines \( \chi^2(1)=2.092, p=0.148>0.05 \). Claims of suitability for children were not statistically significant either \( \chi^2(1)=3.112, p=0.078>0.05 \). Advertisements of food supplements which stated suitability for athletes were statistically significant \( \chi^2(1)=50.975, p=0.000<0.05 \); specifically 69.4\% were seen in women’s magazines and 39.6\% in men’s magazines. Claims about suitability for postmenopausal women were not statistically significant \( \chi^2(1)=0.217, p=0.642>0.05 \). Among the advertisements reviewed, none of them claimed suitability for students. Advertisements of food supplements which stated that they were suitable for all were not statistically significant \( \chi^2(1)=0.108, p=0.742>0.05 \).

6. DISCUSSION

Differentials have been found on how companies target men and women in order to persuade them to consume food supplements. It seems that in terms of product branding women’s magazines, they were more likely to be targeted. For instance, brand name remained an important factor in women’s magazines of both the years along with contact details of distributor company, price and photographs of packaging/container of the product. According to Childs [23], the consumer of functional foods is considered female who is “elite, informed and educated” [23]; therefore targeted female consumers belong to a niche market and require specific marketing strategies such as gender differentiated products, utilization of structure-function messages or optimizing the nonverbal assurances included in the communication messages [23]. Even consumers’ perceptions of functional foods conclude that such products should target women because they purchase foods on behalf of their families [24].

A shift in providing more information to women about the quality characteristics of food supplements has been noticed in 2016 compared to 2014. Information about the ingredients of food supplements was more likely to be seen in women’s magazines in 2016 as well as information about banned substances. The safety of food supplements lacks documentation which concerns health professionals and consumers. Potential risks with botanical dietary supplements may be contamination with pesticides, heavy metals, side effects with prescribed medicine or overdose. The safety of botanical dietary supplements is self-regulated by manufacturers and they can be marketed until proven unsafe [25].

Information about health concerns should be given in all advertisements and all recommendations of food supplements. However, in 2014 and 2016, not all advertisements provided such information and among those which informed readers about health concerns, differentiation was observed in target audiences. It seems that in 2016, information about health concerns was gendered i.e. notification to National Organisation for Medicines was found only in women’s magazines and most disclaimers and warnings in men’s magazines. In 2016, none of the advertisements selected had claims of recommended age of the consumer. Disclaimers and warnings were found
to be statistically significant in 2016 and they were more likely to be found in men’s magazines.

Health professionals can individualise dietary recommendations in order to guide individuals’ food choices and well-being [26]. As food supplements contain a mixture of active chemical compounds, many health risks are related to their use. Therefore, patients who take prescription medications or cancer patients should be informed about the side-effects the herb-drug use may have on them [27]. Also, people with HIV/AIDS commonly use dietary supplements in the context of health information seeking behavior but it is associated with vulnerability to medical misinformation on the internet [28]. The commercialization of human microbiome research, such as dietary supplements, depends not on health or well-being but on mass consumption in chase of potential profits [1].

In this study, claims of availability in pharmacies were gendered in both years i.e. were found more in women’s magazines. Pharmacy stores are considered the most suitable retail outlets for sales of foods for special medical purposes as assistance from healthcare professionals is needed for foods consumed under medical supervision [3]. Moreover, there is increased demand for foods for special medical purposes to manage various therapeutic conditions [3]. As many dietary supplements and natural health products are purchased from pharmacies, the ethical role of pharmacists is important [29]. Specifically, the conflict between increasing patients’ choice regarding access to dietary supplements and natural health products and the pharmacists’ role to protect patients is highlighted. Dietary supplements and natural health products are doubted for their safety and quality; if they are sold in pharmacies, customers consider them as being effective, safe and of high quality [29].

Photographs which showed people promoting food supplements as well as claims of suitability for various categories of consumers, seem to be gendered in 2014 but this trend was not strong enough in 2016. With the exception of men’s photographs which were found to be important in both years’ magazines, photographs were gendered in most cases in 2014 but not in 2016. Professional athletes’ pictures were not found in the sample of lifestyle magazines in 2016 compared to 2014. Athletes’ use food supplements in order to improve their performance or endurance or because of doctor’s advice but accurate information is essential in order to make informed choices [30]. Among all the advertisements in 2014 and in 2016, none of the advertisements used the elderly alone; they may appear in family photos together with their descendants. Photographs of celebrity women/men were not significant in 2014; this may be the reason for their disappearance in 2016 in these samples. It seems that photographs of people seen in food supplements advertisements and recommendations were based on gender stereotypes in 2014 but it was not strong enough in 2016.

Dietary supplements with exaggerated claims in print and on television can mislead consumers who wish to lose weight. Such products are sold by retailers because of customer’s demand even if clinical support is lacking. However, many other dietary supplements provide information based on clinical trials and published data and customers will get the maximum benefit if they prefer those

7. LIMITATIONS

Taste was not counted as a criterion because the sensory experience could not be counted in this analysis.

CONCLUSION

Women’s magazines attracted the majority of food supplements marketing and marketing of food supplements was gendered in Greek lifestyle magazines. Based on the results, it can be argued that the marketing strategy of food supplements changed from 2014 to 2016 and focused on health issues with gendered stereotypes which were applied to appeal to potential customers. It can be argued that marketing of food supplements was aggressive and gendered in 2014 and changed in 2016 with better information given about health concerns and a shift to better information given was noticed in 2016. Marketing claims were gendered in 2014 but in 2016, this trend was not strong enough.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No animals/humans were used for studies that are the bases of this research.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

Not applicable.

FUNDING

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CONFLICT OF INTEREST

Author declares no conflict of interest, financial or otherwise.

