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Online weight loss supplement market and public health: An analysis of Turkish websites marketing weight loss supplements

Çevrimiçi zayıflatıcı gıda takviyesi pazarı ve halk sağlığı: Zayıflatıcı gıda takviyesi pazarlayan Türkçe içerikli internet sitelerinin değerlendirilmesi

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Abstract

Aim. The Internet is becoming the primary tool of purchasing weight loss supplements since it is easily accessible to the consumers. When the uncontrollable nature of the Internet and the public's general tendency to use these supplements are considered together, the information conveyed to general audience in such websites become of great importance in the context of public health. This study aimed to analyze the quality and the quantity of the information conveyed to the consumers by Turkish websites marketing weight loss supplements. **Method.** This study was carried out between June and October, 2009. and a keyword search with the search query strings "weight loss drug" and "herbal weight loss" in Turkish conducted using Google to found websites of first 50 results of each search which were in Turkish and accessible to Turkish people and marketing these products **Results.** In majority of the websites, the information provided was found to be inadequate and misleading. **Conclusion.** Raising the public awareness and bringing restrictions of online marketing of these kinds of supplements are the urgent priorities to protect consumers from possible health risks.

Keywords: Weight loss supplements, herbal weight loss, internet, online, marketing, safety, public health

Özet

Amaç. İnternet, zayıflatıcı gıda takviyelerinin temininde öncelikli bir araç haline gelmeye başlamıştır. İnternetin kontrol edilmesi güç yapısı ve halkın bu takviyelere olan ilgisi düşünüldüğünde, zayıflatıcı gıda takviyelerini pazarlayan web sitelerinden tüketiciye iletilen bilginin halk sağlığı açısından ne kadar önemli olduğu anlaşılacaktır. Bu çalışmada, zayıflatıcı gıda takviyelerini pazarlayan Türkçe içerikli internet sitelerindeki bilginin niceliksel ve niteliksel açıdan değerlendirilmesi amaçlanmıştır. **Yöntem**. Bu çalışma 2009 yılının Haziran ve Ekim ayları arasında Google arama motorunda Türkçe olarak "kilo kaybı ilaç" ve bitkisel kilo kaybı" sözcük dizinleri kullanarak Türk halkının erişebileceği bu ürünleri pazarlayan ilk 50 web sitesinin taranması ile gerçekleştirildi **Bulgular.** Genel olarak web sitelerinin çoğunluğunun içerdiği bilgilerin yetersiz ve yanıltıcı olduğu gözlenmiştir. **Sonuç.** Tüketicilerin bu tür takviyelerin neden olabileceği olası sağlık risklerinden korunması için atılması gereken acil ve öncelikli adımlar, tüketici farkındalığının arttırılması ve bu ürünlerin internet üzerinden pazarlanmasına getirilecek kısıtlamalardır.

Anahtar sözcükler: Zayıflatıcı gıda takviyeleri, bitkisel ilaç ile zayıflama, internet, pazarlama, güvenlilik, halk sağlığı

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Introduction

In today's world the internet has become a major tool for seeking the health care information. Although this quest of information may have beneficial effects on consumer's health, many controversies exist if the presented information is of good quality [1]. Complementary and alternative medicine (CAM) is among the most popular research topics and one of the main elements of CAM is dietary supplements [2]. Dietary supplements, especially the ones designed for weight loss, are appealing to consumers since they have a "natural" image, are easy accessible without prescription, are claimed to be an effortless way to lose weight [3]. The internet is one of the primary places where consumers can utilize these supplements. However, many problems exist regarding the use of these supplements by general public. Firstly, the clinical evidence regarding these supplements' efficacy is controversial and safety is not adequate. As they are perceived as elements of normal diet, manufacturers in Turkey do not need to provide safety and efficacy data to the Ministry of Turkish Health, instead, approval is done by the Ministry of Agriculture and Rural Affairs without any requirement of clinical data. Many countries have similar problem, for example according to Dietary Supplement Health and Education Act of 1994, there is also no obligatory rule that weight supplement manufacturers provide the FDA with clinical efficacy and safety proofs before marketing their products [3]. Secondly, some of these supplements' are subject to adulteration with prescription drugs or chemicals which may lead to unwanted drug-drug interactions or adverse events in patients with chronic diseases. Contamination of these supplements with biologic (bacteria, fungi, moulds) or chemical (pesticides, fumigants, mycotoxins etc) contaminants which may lead to unwanted health effects is another significant problem [4]. Therefore the information provided by the websites marketing these supplements is of great importance from the public health point of view. The aim of this study is to evaluate Turkish websites selling weight loss supplements online, particularly in terms of the quality and the quantity of information they provide to the average consumer.

Material and methods

Internet search

This study was carried out between June and October, 2009. Basically, a keyword search has been conducted using Google with the search query strings "weight loss drug" and "herbal weight loss" in Turkish. The strings were chosen between a numbers of options regarding the ones which have resulted in more websites marketing these products. The particular word "drug" in first keyword was chosen because in Turkish the term "Drug" has a broad meaning covering all prescription drugs, herbal drugs and pharmacy made drugs. Websites which were in Turkish and accessible to Turkish people were included and they were chosen from the first 50 results of each search with each keyword. First 50 results can be accepted as adequate since it was shown in a study that users tend to explore only the first few links on search engines when seeking for health information [5]. Websites were included when they are specific to a particular product and selling it online and were excluded if they are not selling the product online, are retail stores, or selling more than one product. Since the focus of the study is to evaluate the quality and the quantity of the information in the context which the average consumer is exposed to, duplicate vendors for a single product were also included. Selection of the websites was done by one author.

Data evaluation

The content of each website was evaluated with regard to the standard website evaluation form, which was based -yet extended-, on a previous form by Jordan and Haywood [6]. Before the main evaluation, authors went into a pre-evaluation stage in which they evaluated one website individually and then compared their records on the form and discussed their results. The main evaluation was done with three authors and all the

evaluation forms and websites was then controlled by one author. Information presented by the website was analyzed with regard to four dimensions, which were product labeling, weight loss claims, product safety and marketing communications.

Evaluation of product labeling

The questions were directed to analyze active, inactive ingredients and their quantity. Information regarding dose and usage, claimed mechanism of effect was also recorded. Active ingredient is described as the primary ingredient(s) suggested causing weight loss and inactive ingredients as the ingredients which are not suggested to cause weight loss but being present for pharmaceutical or other purposes. Claimed mechanism of effect is described as how the active ingredients are proposed to cause weight loss in the body.

Evaluation of weight loss claims

For this purpose the websites were evaluated if they suggest diet and/or exercise with the supplements they market. This was very important because in preliminary examination some websites were figured out to not suggest diet and/or exercise, furthermore some were putting emphasis on their products does not need to be supported with diet and/or exercise. Websites were also evaluated regarding the expected quantity of weight loss. This can be described as the quantity of weight loss that the website claims during a specific period of usage of their product.

Evaluation of product safety

The reasonability of the safety claims (Statements like "100% safe", "No side effects" were accepted as misleading), adverse effects, warnings or contraindications regarding pregnancy, lactation, diabetes, thyroid disease, renal or hepatic diseases etc. and drug interaction information were evaluated. Websites were also analyzed if they involve one or more phrase that is described as "clue to fraud" by the FDA. These were "easy, scientific breakthrough, miraculous cure, secret ingredient and ancient remedy" [7].

Evaluation of marketing communications

In the preliminary examination it was detected that most of the sites use "Ministry Approved" as a catchy phrase. This was important because most websites use this phrase without giving the specifications of the related ministry and probably create a misperception that the approval was done by The Ministry of Health. However, most of these approvals are usually done by Ministry of Agriculture and Rural Affairs. So, the phrase "Ministry Approved" was searched among the websites and the ones using this were accepted as misleading ones. Websites were also evaluated regarding the color scheme they use, price of the product and communication information.

Results

Thirty-three websites with a total of 26 products were analyzed between June-October 2009. Various herbal ingredients were found in the content of products. Most common herbal ingredients identified in supplements were Garcinia Cambogia (27%), Lotus flower extract (27%), Guarana (23%), Cassia species (31%), Yerba mate (15%), green tea (23%), and Citrus aurantium (15%) (Table 1).

Table 1. Herbal ingredients which are most frequently included by the weight loss supplements identified in the Turkish Online market. Numbers in parentheses are the percentages of the evaluated supplements (n=26) containing related herbal ingredient.

Garcinia Cambogia	27 %
Lotus flower	27 %
Guarana	23 %
Cassia species	31 %
Yerba mate	15 %
Green tea	23 %
Citrus aurantium	15 %

Product labeling

Active ingredients were listed in most of the websites (82%), however the information was partial or missing in the remaining 18%. The quantities of active ingredients were not specified in 88% of websites. Inactive ingredients were stated in only 9%. Overwhelming majority of the websites (94%) claimed one or more mechanisms of effect regarding the product, mostly being futile statements.

Information regarding weight loss goals

Nearly one-half of the websites (54%) did not give information whether the product should be used with diet and exercise, and 18% of them were found to claim that diet and exercise were not required. Almost three-fifth of the websites (58%) specified the expected quantity of weight loss.

Product safety information

The safety claims of the product were not found to be scientifically reasonable in 91% of websites. 30% of the websites referred to scientific studies, however only half of the referrals were able to specify a study, and among these, only 3% pointed to a clinical study. 18% of websites did not carry information regarding the use of their product during pregnancy and lactation, while 6% of them encouraged use of the supplement during lactation, which is entirely unacceptable. Hypertension and cardiac disease were stated as contraindications in only 48% and 42% of the websites, respectively; however for both groups 6% of websites indicated that the use of product in patients who had this kind of diagnosis is acceptable. A high percent of the websites presented no information regarding the use of their product in diabetes, thyroid disease and chronic liver and/or renal diseases (70%, 73%, and 82%, respectively). Likewise, 64% of websites lacked information about drug interactions. 42% of the websites did not specify an age range for the use of their product. The statement "natural" was displayed in 76% of websites.

Marketing communications

Seventy percent of the websites had approval from the Ministry of Agriculture and Rural Affairs for their product, which is the legal procedure to market these kinds of supplements in Turkey; however 27% of websites did not refer to or specify any institutional approval. Only 3% of the websites were approved by The Turkish Ministry of Health. Almost one third (27%) of websites were found to present an opinion leader. The occupations of these opinion leaders were various: famous Turkish singers and models, some popular medical doctors, product managers and anonymous national athletes were used as opinion leaders. More than one-half of the websites included a green color scheme (54%) followed by white (24%), and all of them included price information. The price of one box was < € 25 for 21%, between € 25-50 for 76% and > €50 for 3% of the products, respectively [1]. All of the websites were found to be offering various promotions, which included discounts for purchasing multiple boxes of the product and gift packs such as weight loss belts. Permanent address information of the firms was included in only one-third of the websites (33%), while most of them provided mobile phone numbers for contact.

Discussion

Reasons for overweight and obese patients' aptitude to weight loss supplements are various. To name a few, previous ineffective attempts at dieting and/or exercise, appealing natural image of these products, easy access without prescription, and claims of losing weight without any effort renders them attractive to average consumer [3]. From the public health point of view the main problems regarding these supplements are their safety and efficacy. In the United States, according to dietary Supplement Health and Education Act of 1994, there is no obligatory rule that weight supplement manufacturers provide the FDA with clinical efficacy and safety proofs before marketing their products [3]. The situation is similar in Turkey, as the manufacturers are able to get approval from

the Ministry of Agriculture and Rural Affairs without presenting any clinical safety and efficacy information. Actually, recent reviews suggest that great majority of weight loss supplements lack adequate efficacy and safety data [8]. Chromium picolinate, for instance, which is currently used as an active substance in popular weight loss drugs, led to a reduction of 0.08-0.2 kg/week compared with placebo during an administration period of 6-14 week. Although this finding was statistically significant, it is suggested to lack clinical meaning [9]. A meta-analysis by Pittler et al. [10] also showed that there is no compelling evidence about the effectiveness of herbal popular weight loss ingredients like chitosan, Garcinia cambogia, guar gum, psyllium, pyruvate and yohimbe. The other side of the problem is the safety of these supplements. A range of adverse events are identified in literature regarding herbal food supplements, although only a small number of such reports are available compared to the popularity of these products. However, a possibility of under-reporting of these adverse events may also exist [10]. In a study of Cuzzolin et al. [11], which surveyed 1,063 women using herbal medicines, 9.6% of the sample population reported adverse events, more importantly in 61.7% of cases the adverse reaction was not conveyed to the doctor. Moreover, several examples of adverse events regarding weight loss supplements exist in literature. Probably the most recognized adverse event profile belongs to Ma Huang, which is an ephedra alkaloid. This substance was demonstrated to cause harmful cardiac and CNS effects [12], and subsequently banned by the FDA in April 2004 [13], although it is still reported to be available through online sources in different forms and mixtures. Hydroxycut, which is a popular weight loss supplement, has been reported to be associated with hepatotoxicity [14]. Chromium, another popular active ingredient, was linked with cases of acute hepatitis, thrombocytopenia and renal failure in a woman with chronic excessive use [15], and with rhabdomyolysis in two cases who used chromium as exercise aid [16, 17]. Cassia species were the most frequent ingredient as declared by the evaluated websites within this study. Similarly, Saraçoğlu and Ergun [18] also has reported cassia species as the most prominent ingredient in their study which had investigated the composition of 13 different trademarks of slimming tea contents. Furthermore, authors stated that slimming tea contents were usually composed of herbal ingredients which are known for their diuretic and laxative actions that may lead to electrolyte imbalances such as hypokalemia and associated complications like arrhythmias in predisposed patients. During the analysis, websites were also examined regarding how side effect information was conveyed. Misleading statements like “100% safe”, “No side effects” were present in 91% of the websites. Recent studies indicate that consumers often (44.7%-71.8%) take herbal drugs in combination with prescription drugs [19, 20], and it is suggested that herb-drug interactions may also be significantly underreported, and accompanying the fact that monitoring the adverse effects of herbs and herb-drug interactions is not fully developed in many countries [21]. Since the majority of the available weight loss supplements include herbal ingredients, the awareness of the potential drug interactions is of great importance in daily clinical practice considering that patients may not perceive herbal supplements as drugs and they may ignore to inform their health care provider of their use [22]. Our search showed that 64% of websites did not contain any information regarding drug interactions, which may be misleading for patients who use other drugs. Furthermore, 6% of the websites claimed that their supplements have no drug interactions. The lack of information about drug interactions, or misleading claims that drug interactions are not present is extremely dangerous, since there is considerable evidence in literature that herbal ingredients are reported to interact with drugs [21, 23]. Guar gum, for instance, was shown to potentiate the effects insulin and interfere with the absorption of oral contraceptives [9]. Pausinystalla yohimbe may increase the risk of hypertension if it is used with tricyclic antidepressants [22]. Erkekoğlu et al. [24], evaluated the constituents of commercial powder and liquid weight loss products and reported that whey protein was the most frequent constituent which was followed by soy protein, kreatin, aminoacids, psyllium etc. The authors highlighted the possibility of previously identified drug interactions between whey protein, due to its calcium

ingredient, and drugs like floroquinolones, tetracyclines, digoxin and biphosphonates. Additionally, there is always a risk of experiencing unidentified drug interactions with such supplements. The FDA occasionally issues warnings and bans about weight loss supplements sold through the Internet which are confirmed to involve illegally added prescription drugs. Our study demonstrated that most of the websites marketing weight loss supplements provided inadequate information concerning product ingredients. Active ingredients' quantity was missing in the majority (88%) of the websites. In a recent case report, a patient who purchased a weight loss supplement over the Internet subsequently experienced adverse events. After the medical consultation, sibutramine was identified in the urine of the patient as the active ingredient, which is a prescription drug used in obesity treatment. Further analysis of the supplement had revealed that sibutramine content of a single capsule was nearly two times the daily recommended dose which may lead to toxicity [25]. Rimonabant was also detected in these kinds of supplements, which is launched to the market in 2007 for weight reduction treatment. Rimonabant was associated with 5 deaths and 720 adverse events and officially withdrawn form the market by the European Medicines Agency (EMEA) in October 2008 [26]. Moreover, prescription drugs like phenytoin, bumetanide and chemicals like phenolphthalein were also detected in weight loss supplements by the FDA [27] of which constitute a serious threat to individuals who consider using these supplements. Recently on January 21, 2010, EMEA recommended suspension of marketing authorizations for sibutramine [28]. Our study also revealed that almost one fifth (18%) of the websites examined did not seem to contain information concerning the dose and use of the product, which increases the possibility of overdosing and toxicity. Trustworthiness is a critical dimension of e-commerce and the literature suggests that the presentation of the online content has a significant impact on purchase intentions [29, 30]. Presentation in this context may entail the use of persuading phrases as well as the design elements such as graphics or color schemes, which are significantly important in building trust [31]. Evaluation of design elements revealed that 78% of the websites were developed on either a green or white color scheme, which probably was due to the referral of green to health, nature and "natural", and the referral of white to "purity" [32]. The websites were also investigated with regard to their use of catchy words or phrases for marketing purposes, which revealed that 76% of them contain at least one phrase that is described as "clue to fraud" by the FDA. These were "easy, scientific breakthrough, miraculous cure, secret ingredient and ancient remedy" [7]. Besides, websites were also assessed how frequently they include the phrase "natural", which may seem descriptive and innocent at first glance since majority of weight loss supplements hold herbal ingredients. However, consumers may tend to perceive "natural" as "safe" [19], therefore this phrase, which was used by 76% of websites include in our study, may also be misleading for the average consumer.

Finally, it was demonstrated in our study that the quality and the quantity of the information present in websites marketing weight loss supplements were far from being adequate and guiding. Online marketing of these kinds of supplements should be limited with legal codes. Random analysis of the ingredients is highly necessary to detect illegally added prescription drugs, while serious penalty and ban should be considered in case of presence. In addition, raising public awareness may be a major priority to minimize the risk of undesirable consequences.

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