

# The advertising of nutritional supplements in South African women's magazines: a descriptive survey

**Schoonees A**, BScFood Science, M Nutrition, MScMedSciClin Epi, Researcher

Centre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University

**Young T**, MBChB, FCPHM, MMed, Director

**Volmink J**, BScBiochemistry, MBChB, DCH(SA), MPH(Harvard), DPhil(Oxon), MASSAf, Dean

Centre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University

South African Cochrane Centre, South African Medical Research Council

**Correspondence to:** Anel Schoonees, e-mail: [anelschoonees@sun.ac.za](mailto:anelschoonees@sun.ac.za)

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## Abstract

**Objective:** Nutritional supplements are inadequately regulated in South Africa. These types of products are increasingly advertised and the advertisements frequently contain health claims. Because advertisements play a considerable role in informing potential consumers, it is crucial that information about supplements in advertisements is accurate. A survey was carried out to determine the extent to which health claims are made in nutritional supplement advertisements and to describe the appropriateness of the research cited within the advertisements in support of the health claims.

**Design:** The design was a descriptive survey.

**Method:** The five women's magazines with the highest circulation figures in South Africa in July 2010 were identified by the Audit Bureau of Circulations of South Africa as *Cosmopolitan*, *Finesse*, *Move!*, *Rooi Rose* and *Sarie*. Issues of these magazines were obtained during the period from September 2010 to August 2011. Pre-specified eligibility criteria were used to identify suitable advertisements and to determine the percentage of nutritional supplements about which health claims were made. The percentage of these supplements for which research was cited in support of the claims was also determined, and the level and appropriateness of the cited research, described.

**Results:** In total, 486 eligible advertisements were identified which referred to 158 nutritional supplements. Of these, 137 (86.7%) made health claims and 9 of the 137 (6.6%) cited research to support their claims. The cited research was judged to be largely inappropriate based on study design and/or the characteristics of the study.

**Conclusion:** South Africans should be wary of advertisements that make claims about the health benefits and safety of nutritional supplements. Regulation of the advertising of nutritional supplements is urgently needed.

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## Introduction

Advertising nutritional supplements with health claims is becoming increasingly common in South Africa. References to research that is included in these advertisements may lend credibility to certain claims and promote the marketing of these products. Yet cited research that is contained in advertisements may not always be appropriate, sufficient or valid for the products being advertised.<sup>1-3</sup> A study that was carried out among Stellenbosch University students in 2003 showed that 42% of the 400 sampled students regularly consumed supplements, while 19.5% sporadically took supplements when stressed, tired or ill.<sup>4</sup> Steele and Senekal found that the reasons that were provided by regular supplement users for taking supplements reflected the advertising strategies of supplement manufacturers. Furthermore, participants indicated that the main source of information about supplements were family and friends, followed by doctors and advertisements.<sup>4</sup> Therefore, advertisements

may play a considerable role in informing potential consumers. It is crucial that the information about supplements in advertisements is accurate.

Nutritional supplements are inadequately regulated in South Africa. Their regulation is meant to be provided for either by the Medicines and Related Substances Act (Act 101 of 1965),<sup>5</sup> or the Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972).<sup>6</sup> However, there is ongoing debate about which Act is applicable and a final decision about this is still pending. The Advertising Standards Authority, an industry body, can in some cases intervene in the case of misleading claims to prevent further advertising of an ambiguous product in the media, e.g. regarding supplements that include weight-loss claims, over-the-counter medicines and protein claims relating to food and smoking deterrent products. However, they cannot prevent the sale of these products or stop misleading advertising in areas in which they have no jurisdiction, e.g. nutritional supplements that include claims

about cardiovascular health, cancer protection, detoxing and acne. The Medicines Control Council recently published draft regulations for the management of complementary and alternative medicines,<sup>7</sup> but they do not contain any criteria to determine the efficacy and safety of nutritional supplements. Promulgation of the new food labelling and advertising legislation in March 2010 in South Africa was a welcome development, but currently, this legislation only covers health claims on food packaging and not those that relate to nutritional supplements. The Foodstuffs, Cosmetics and Disinfectants Act defines a food claim as “any written, pictorial, visual, descriptive or verbal statement, communication, representation or reference brought to the attention of the public in any manner, including a trade name or brand name, and referring to the characteristics of a product, in particular to its nature, identity, nutritional properties, composition, quality, durability, origin or method of manufacture or production”.<sup>6</sup> However, this definition does not explicitly refer to health effects.

In contrast, the regulation of nutrition and health claims for both food and nutritional supplements, and the advertising thereof, has been in place in the EU since 2007.<sup>8</sup> In the EU, a health claim is defined as “any claim that states, suggests or implies that a relationship exists between a food category, a food or one of its constituents and health”. More specifically EU regulations refer to a “reduction of disease risk claim” as “any health claim that states, suggests or implies that the consumption of a food category, a food or one of its constituents significantly reduces a risk factor in the development of a human disease”. Furthermore, the European Food Safety Authority has specified wording for claims that are allowed on the packaging of relevant food and nutritional supplements.<sup>8</sup> In the USA, the Nutrition Labeling and Education Act of 1990 requires that health claims on food and nutritional supplements are made with the approval of the US Food and Drug Administration (FDA).<sup>9</sup>

This study sought to provide information on health claims that were made in nutritional supplement advertisements in South Africa. South African women's magazines were sampled over a one-year period to determine the number of nutritional supplements covered, what percentage of these advertisements contained health claims, and of these, what percentage cited research. The evidence level and study characteristics were then assessed to determine the appropriateness of the cited research for the health claims that were made.

## Method

### Selection of study sample

The Audit Bureau of Circulations (ABC) of South Africa was contacted in July 2010 to identify the five registered women's magazines with the highest circulation figures. These magazines, in alphabetical order, are *Cosmopolitan*, *Finesse*, *Move!*, *Rooi Rose* and *Sarie*. *Move!* is published weekly, and the others, monthly. *Cosmopolitan* and *Move!* are published in English, while *Finesse*, *Rooi Rose* and *Sarie* are published in Afrikaans. The number of South Africans who read these five women's magazines, as well as demographic information estimated for 2011 by the South African Advertising Research Foundation (SAARF), is displayed in Table 1.<sup>10</sup>

For the period September 2010 to August 2011, all issues of the monthly magazines and the first issue in each month of the weekly magazine (60 issues in total) were purchased. Each magazine issue was screened at least twice by the first author to identify potentially eligible advertisements. Then the first and second authors used the following pre-specified eligibility criteria to finalise the sample: an advertisement that specified or named at least one supplement intended for oral consumption by people; the supplement could be in any form, e.g. a tablet, capsule, gel, powder or liquid, as long as it contained at least a vitamin, mineral, herb (or other botanical), amino acid, carbohydrate or fatty acid; and it was not allowed to be a functional food.

### Data extraction

A 22-question data extraction form was designed and piloted to guide data collection. This form included closed- and open-ended questions and consisted of different sections, namely general (product and manufacturer's name, contact details, months and magazines in which the advertisements were published), and quotes (health claims, referrals to research or statistics, persuasive remarks, and anecdotes or recommendations). The Levels of Evidence tool, developed by Oxford University's Centre for Evidence-based Medicine, was used to determine the level of evidence that was cited in the advertisements.<sup>11</sup> Finally, after reading the full text of the cited articles, the appropriateness or directness of the research was assessed by taking the study design, types of study participants, interventions, controls and outcome measures (primary outcomes) into account.

**Table 1:** South African readership statistics of the researched magazines in this study<sup>10</sup>

	ER number*	ER %, (95% CI)**	Population group distribution (% readership)				Home language distribution (% readership)					Age (years) distribution (% readership)				LSM group distribution (% readership)***		
			B	C	I	W	Afr	Eng	Xho	Zul	Oth	1-24	25-34	35-49	≥ 50	LSM 1-4	LSM 5-8	LSM 9-10
<i>Cosmopolitan</i>	833 000	2.4 (2.21-2.29)	54.4	9.8	7.6	28.1	15.2	32.9	12.2	17.0	22.7	28.1	29.4	28.6	13.9	1.6	54.0	44.4
<i>Finesse</i>	245 000	0.7 (0.6-0.8)	5.3	29.8	0.4	64.9	83.3	11.4	3.7	0	1.6	14.6	15.8	26.0	43.6	1.1	42.7	56.2
<i>Move!</i>	2475 000	7.1 (6.78-7.42)	96.4	2.7	0.3	0.6	3.1	3.4	14.3	20.6	58.6	41.2	29.7	21.5	7.6	13.2	74.2	12.6
<i>Rooi Rose</i>	909 000	2.6 (2.4-2.8)	23.3	32.0	0.5	44.2	67.2	10.6	2.4	1.6	18.2	19.3	18.5	30.8	31.4	10.4	56.4	33.2
<i>Sarie</i>	868 000	2.5 (2.31-2.59)	20.6	30.0	0.6	48.8	70.5	10.0	2.6	2.0	14.9	16.8	17.3	31.4	34.3	8.6	54.8	36.6

\* Readership between January and December 2011 was estimated by the South African Advertising Research Foundation (SAARF) by asking the surveyed respondents whether or not they had read a copy of a specific magazine within a certain period prior to the survey. The period was no longer than the issue period of that magazine, i.e. within seven days for a weekly magazine.<sup>10</sup>

\*\* Denominator is South Africa, with an estimated 34 million people aged ≥ 15 years in 2011.<sup>10</sup>

\*\*\* Living standards measure (LSM), which is a wealth measure based on standard of living, rather than income. The higher the living standards measure group, the wealthier the household, e.g. has hot running water, a refrigerator and freezer, an electric stove and a home security service.<sup>10</sup>

Afr: Afrikaans, B: black, C: coloured, CI: confidence interval, Eng: English, ER: estimated readership, I: Indian, Oth: other, W: white, Xho: Xhosa, Zul: Zulu

**Table II:** Levels of evidence for health claims and criteria for appropriateness<sup>11</sup>

Level	Study design
1	Systematic review of RCTs: First-prize evidence of health claims' effectiveness
2	Individual RCT (with narrow confidence interval): Gold standard for primary research on effectiveness
3	Systematic review of cohort studies
4	Individual cohort study (and low-quality RCT, e.g. < 80% follow-up)
5	"Outcomes" research and ecological studies
6	Systematic review of case control or cross-sectional studies
7	Individual case control or cross-sectional study
8	Case series (and poor quality cohort and case control studies, and uncontrolled studies)
9	Expert opinion, animal research and laboratory studies
10	None of the above
Study criteria	
A	Appropriate study design: Ideally systematic reviews of RCTs, otherwise individual RCTs.
B	Appropriate participants: Humans diagnosed with the specific outcome of interest where eligibility criteria were reasonable and reported baseline characteristics per group were similar to the product's target market.
C	Appropriate intervention: The product being advertised (preferably as a whole, otherwise evidence is needed for all ingredients) where the dose and frequency of use are similar to the product instructions. There may have been a co-intervention, provided it was also given to the control group.
D	Appropriate control: Standard treatment or placebo.
E	Appropriate primary outcomes: Patient-important clinical outcomes.

RCT: randomised controlled trial

The criteria that were used to assess the level and appropriateness of cited research are provided in Table II. One data extraction form per nutritional supplement was completed, using information from all relevant advertisements for a specific product during the course of the year.

**Analysing data**

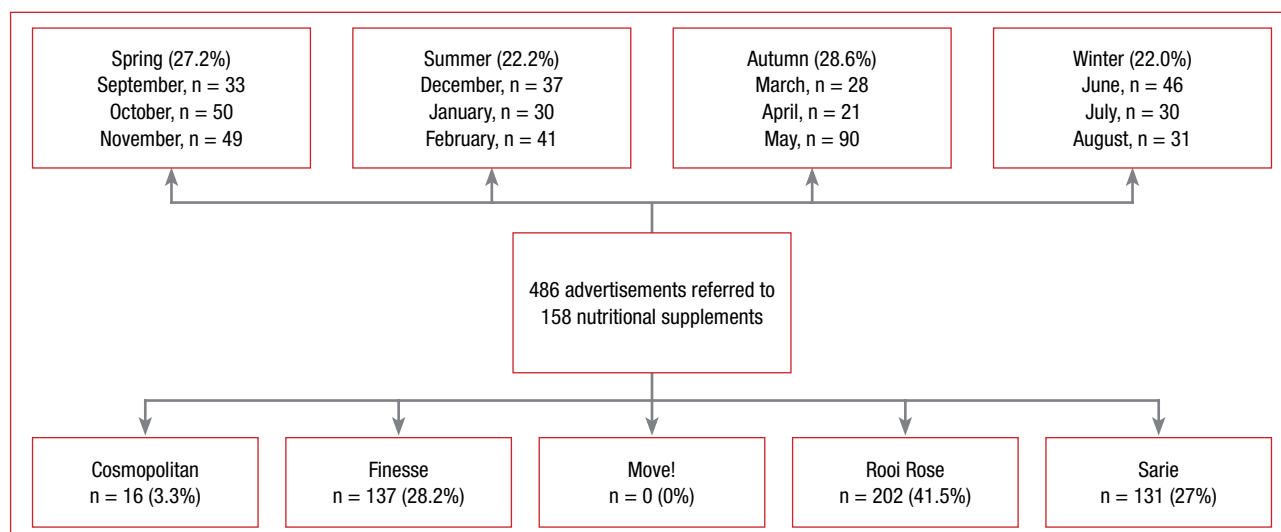
Data were summarised in a diagram, bar chart and table. The health claims of the nutritional supplements were grouped into various categories, e.g. weight loss and toning, immune system and energy, cardiovascular health, and joint and cartilage, according to the broader health area to which the main or first health claim applied.

**Ethics**

As the data source of this project was advertisements that were in the public domain, the Health Research Ethics Committee of Stellenbosch University provided ethics review exemption (N11/10/306).

**Results**

In total, 486 eligible advertisements referring to 158 different nutritional supplements were identified. Figure 1 displays the number of nutritional supplement advertisements according to month and magazine. There were no eligible advertisements in *Move!* Almost all of the advertisements (96.7%) were sourced from



**Figure 1:** Number of nutritional supplement advertisements (n = 486) according to month and magazine for the period September 2010 to August 2011

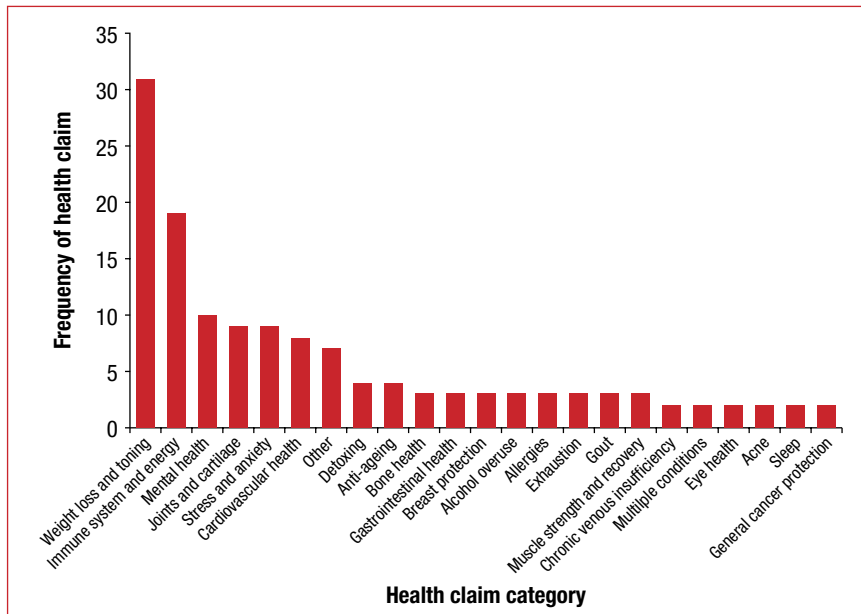


Figure 2: Range of health claims (n = 137) that appeared in the included advertisements

Table III: Selected health claim quotes for the specified categories

#### Weight loss and toning

- *Slender Max Glucoslim®*: "Slim down and feel immediately satisfied by this stimulant-free solution that is clinically proven to work".
- *Ultima 1® and Ultima Burnxpress®*: "With Ultima1® and Burnxpress® you have the perfect weight loss combination to not only lose weight fast, but keep it off forever".
- *Organo-Slim®*: "Organo-Slim works by normalising your blood sugar levels so that you have a reduced craving for sweets. This makes it much easier to eat healthily because you lose your appetite for junk food. It also reduces the absorption of calories and helps your tummy to work regularly".

#### Immune system and energy

- *Vita-thion®*: "vita-thion® is the only registered supplement in South Africa that gives you sustainable energy because it contains ATP".
- *Solal All You Need Teens™*: "Contains high dosages of vitamins, minerals and herb extracts that decrease stress and enhance brain function. It also contains probiotics and antioxidants for a stronger immune system and spirulina for detox".

#### Mental health

- *Vital® Ginkgo Biloba*: "Survive exams and think on your feet with this wonder herb. Ginkgo biloba is widely used in Western medicine as an aid for poor memory and concentration".
- *Solal Theanine®*: "Helps the brain to relax and enhances brainwave function which enhances sleep".

#### Multiple conditions

- *Essies® tea*: "Prevents the build-up of excess fat in the veins, heart, kidneys and liver; regulates cholesterol by converting sugar and fat into energy; neutralises acids, absorbs toxins in the intestines and eliminates both; prevents and slow down the formation of tumours; and removes heavy metals around joints to reduce inflammation and stiffness".

#### Acne

- *Clear Skin B5®*: "It shrinks the pores, reduces the functioning of oil glands and heals the colour and texture of your skin. It provides sufficient coenzyme A, which regulates hormones and breaks down oil on the skin. Clinical research shows that it is just as effective as accutane or roaccutane, but without the side-effects. As a 100% natural product, it is safe and much more effective than any other antibiotic for acne on the market today".

These quotes were translated from Afrikaans to English by one of the authors.  
ATP: adenosine triphosphate

the three Afrikaans language magazines. The proportions of eligible advertisements across the four seasons of the year were similar, ranging from 22% in winter to 28.6% in autumn.

Health claims were made for 137 (86.7%) of the 158 identified nutritional supplements which covered a wide range of conditions (see Figure 2). The most common claims related to weight loss and body toning (22.6%), and the immune system and energy boosting (13.9%) category. The category "Other" represented seven nutritional supplements in instances when the main health claim did not fall into any other category. These seven products contained health claims relating to diarrhoea, prostate health, menopausal symptoms, enhancing a tan, cold sores, school performance, as well as hair, skin and nail health.

In Table III, illustrative quotes are presented from the three categories with the highest number of health claims, as well as from the categories' "multiple conditions" and "acne".

Only nine (6.6%) of the 137 nutritional supplement advertisements with health claims cited research. Table IV shows the nature of the cited research, including the level of evidence and study characteristics. Seven of 15 (46.7%) citations were judged to be inappropriate in terms of study design because they were laboratory studies, expert opinion (websites and a product monograph that referred to a textbook), a package insert and an uncontrolled trial. No systematic reviews were cited. Most of the cited randomised controlled trials (RCTs) had small sample sizes and a long list of exclusion criteria. These factors would limit the applicability of study findings to a broader group of patients suffering from various conditions. Antistax® is the only product whose direct efficacy was tested in a RCT. The other cited studies only investigated the efficacy of specific ingredients or their association with certain outcomes, while the product as an entity was not studied. The longest intervention period was 12 weeks which is insufficient to draw conclusions about the long-term benefits or safety of the product. All controlled trials cited were placebo-controlled.

Finally, it is worth noting that several advertisements used arguments other than research evidence to persuade consumers. Examples include citing Bible verses "... and also that every man should eat and drink and enjoy the good of all his labour; it is the gift of God" (translated from Afrikaans, New King James Version, Ecclesiastes 3:13; Cosmo Slimming Solutions); thanking God for the product "our deepest thanks to the Creator who lets these herbs grow that we may use them" (translated from Afrikaans, Essies Tea); reassuring potential consumers of the product's efficacy and safety by mentioning that doctors and pharmacists endorse the product "prescribed by doctors, recommended by pharmacists" (Solal Technologies); and implying that the product is a necessity "you will have to eat enormous portions of calcium-rich foods such as milk, broccoli, salmon and almonds to meet your body's

Table IV: Nature of evidence cited in sampled advertisements

Nutritional supplement	Health claim category	Level of evidence	Sample size	Study characteristics
<b>Antistax®</b> <i>Ingredients:</i> One tablet contains 360 mg Antistax®. <i>Instructions:</i> One tablet daily before breakfast, which may be increased to 2 tablets daily.	Chronic venous insufficiency	RCT	260	<i>Participants:</i> Men and women (25-75 years) with stage 1-2 CVI in Germany. There was a long list of exclusion criteria, such as insulin-dependent diabetics, those with renal failure, liver disease, peripheral arterial disease, malignancies, neuropathies, hyper- or hypocalcaemia, decompensated heart pump failure, oedema that did not relate to CVI, drug or alcohol abuse, and patients who required acute specific treatment for venous disorders. Baseline characteristics per group were reported for age, gender, weight, height and BMI. <i>Intervention 1:</i> Antistax® 360 mg daily for 12 weeks. <i>Intervention 2:</i> Antistax® 720 mg daily for 12 weeks. <i>Control:</i> Placebo. <i>Outcome:</i> Change in lower leg volume.
<b>Ensure®</b> <i>Description:</i> Meal replacement containing numerous vitamins, minerals and FOSs. 100 ml provides 420 kilojoules, 3.72 g protein, 3.27 g fat, 13.42 g carbohydrates and 1.01 g FOSs.	Immune system and energy	Expert opinion	-	-
<b>eye q™</b> <i>Ingredients:</i> Two capsules contain 800 mg fish oil omega-3 (which gives 186 mg EPA and 58 mg DHA), 200 mg evening primrose oil omega-6 (which gives 20 mg GLA), and 3.6 mg natural vitamin E. <i>Instructions:</i> Six capsules daily with food for the first 12 weeks, and 2 capsules daily thereafter.	School performance (part of category called "Other")	RCT	117	<i>Participants:</i> Mainstream school children (5-12 years) with developmental coordination disorder in the UK. Eligibility criteria excluded children with epilepsy, diabetes, depression and chronic fatigue syndrome. Baseline characteristics per group were not reported. <i>Intervention:</i> Supplement containing 732 mg omega-3, 60 mg omega-6 and 9.6 mg vitamin E for 3 months. <i>Control:</i> Placebo. <i>Outcomes:</i> Change in motor function, reading and spelling, and teacher-rated attention-deficit hyperactivity disorder-related symptoms.
<b>HeartChoice™ Optimal with CoQ10</b> <i>Ingredients:</i> One capsule contains 150 mg coenzyme Q10, 15 mg resveratrol and 15 mg magnesium. <i>Instructions:</i> One capsule daily.	Cardiovascular health	Expert opinion. Package insert. Cross-sectional study.	- - 98	- - <i>Participants:</i> Hispanic and African-American women of whom 50 were premenopausal and 48 postmenopausal (15 on HRT). Baseline characteristics per group were provided for age, weight, LDL and HDL cholesterol, total cholesterol and triglyceride levels. <i>Exposure:</i> Natural menopause and HRT. <i>Outcome:</i> Serum levels of coenzyme Q10.
<b>Nativa Hormonal Complex®</b> <i>Ingredients:</i> 160 mg piceae pollen/pollen-pistil extract and 7.85 mg vitamin E. <i>Instructions:</i> Two tablets daily for 3 months. Thereafter, the dosage can be adjusted to individual needs.	Menopausal symptoms (part of category called "Other")	Uncontrolled trial	417	<i>Participants:</i> Menopausal women in France with menopausal symptoms and those not on medication. Eligibility criteria excluded people with hot flushes and/or night sweats not associated with the menopause. Baseline characteristics were reported for age, weight, height and BMI. <i>Intervention:</i> Séréllys® to provide daily 10 mg vitamin E, 80 mg pollen extract (GC FEM), and 240 mg cytoplasmic pollen and pistil extracts (PI 82) for 84 days. <i>Outcome:</i> Descriptively assessed hot flush occurrence, irritability, fatigue and quality of life.
<b>Procydin®</b> <i>Ingredients:</i> 70 mg proanthocyanidin (from grape seed extract), 30 mg calcium ascorbate, 30 mg bioflavonoids and 15 mg vitamin E. <i>Instructions:</i> Adults weighing < 70 kg should take 3 capsules simultaneously in the morning for 3 days, then 2 capsules daily for 5 days, thereafter 1 capsule daily; whereas adults weighing ≥ 70 kg should take 3 capsules simultaneously in the morning for 5 days, and 2 capsules daily thereafter.	Multiple disorders	RCT	27	<i>Participants:</i> Men and women (25-80 years) in the USA with metabolic syndrome. Eligibility criteria excluded smokers and those with clinical evidence of coronary heart artery, pulmonary, gastrointestinal or renal disease. Baseline characteristics were reported per group for age, gender, waist circumference, BMI, glucose and insulin levels, as well as LDL cholesterol levels. <i>Intervention 1:</i> Grape seed extract 300 mg/day for 4 weeks. <i>Intervention 2:</i> Grape seed extract 150 mg/day for 4 weeks. <i>Control:</i> Placebo. <i>Outcome:</i> Mean daytime systolic and diastolic blood pressure.

<b>Promato®</b> <i>Ingredients:</i> 10 mg lycopene and 150 mg ellagic acid. <i>Instructions:</i> One capsule daily after meals.	Breast protection (but a second health claim in the advertisements is for prostate health)	Laboratory study. RCT	- 40	- <i>Participants:</i> Histologically proven benign prostate hyperplasia in men in Germany who were free of prostate cancer and had serum PSA levels > 4 µg/l. Eligibility criteria excluded people with liver and kidney diseases, inflammatory diseases of the urogenital tract, chronic inflammatory bowel disease, prostate malignancies, those having testosterone treatment and fat malabsorption or maldigestion. Baseline characteristics per group were reported for age, height, weight, BMI, energy intake, dietary lycopene intake, glucose levels, total cholesterol and LDL cholesterol levels, and for total testosterone and free testosterone levels. <i>Intervention:</i> Lycopene 15 mg/day for 6 months. <i>Control:</i> Placebo. <i>Outcome:</i> Serum PSA levels. <i>Participants:</i> Men with professional jobs in America (40-75 years) without any cancer at baseline. <i>Exposure:</i> Total lycopene intake, where high levels of intake were compared to the lowest level of intake. <i>Outcome:</i> Incidence of prostate cancer after being followed-up for 12 years.
<b>Prozen®</b> <i>Ingredients:</i> 100 mg L-theanine as Suntheanine®. <i>Instructions:</i> One to two tablets daily after a meal as needed to a maximum of 6 daily in divided dosages.	Stress and anxiety	Cross-over trial (unclear whether randomised or not. The information was only available in the form of a congress abstract).	22	<i>Participants:</i> Men in Japan (average age 27); 12 of the 22 were daytime workers. <i>Intervention:</i> Suntheanine® (pure L-theanine) 200 mg for 6 days, one hour before bedtime. <i>Control:</i> Placebo. <i>Outcome:</i> Sleep performance measured by interviews upon awakening.
<b>Solal Irvingia Plus™ Fat Burner</b> <i>Ingredients:</i> 150 mg <i>Irvingia gabonensis</i> extract, 150 mg bile acids, 8 mg zinc and 200 µg chromium polynicotinate. <i>Instructions:</i> One to two capsules, twice a day, on an empty stomach.	Weight loss and toning	Laboratory study (in mice). RCT	- 120	- <i>Participants:</i> Overweight men and women in Cameroon with BMI 26-40 kg/m <sup>2</sup> . <i>Intervention:</i> 150 mg <i>Irvingia gabonensis</i> extract (IGOB131) 30-60 minutes before lunch and dinner for 10 weeks. <i>Control:</i> Placebo. <i>Outcome:</i> Body weight (kg).

BMI: body mass index, CVI: chronic venous insufficiency, DHA: docosahexaenoic acid, EPA: eicosapentaenoic acid, FOS: fructo-oligosaccharide, GLA: gamma-linolenic acid, HDL: high-density lipoprotein, HRT: hormone replacement therapy, LDL: low-density lipoprotein, PSA: prostate-specific antigen, RCT: randomised controlled trial

calcium requirements if Caltrate® Plus is not part of your daily diet” (translated from Afrikaans, Caltrate® Plus).

## Discussion

This study found that most nutritional supplement advertisements in five popular South African women's magazines contained health claims that related to the prevention or treatment of a variety of conditions. Research to support these claims was cited in only a few advertisements, and this research was judged to be largely inappropriate because of the study design (risk of bias) or lack of applicability of the evidence, or both. Furthermore, several advertisements contained nonscientific arguments aimed at convincing consumers of the value of a particular supplement, e.g. the use of Biblical text or endorsement by healthcare professionals. This situation is unacceptable as it increases the likelihood of consumers being misled by unscrupulous marketing. Disingenuous advertising is forbidden by the Medicines and Related Substances Act<sup>5</sup> which states that “no person shall in any advertisement make any claim to the effect that the therapeutic efficacy and effect of any medicine is other than that stated by the (Medicines Control) Council”. However, it is not clear from the Act what research criteria need to be met in order for a legitimate health claim to be made.

Advertising of healthcare products has been studied elsewhere. Othman et al conducted a systematic review of the quality of

pharmaceutical advertisements that related to prescription products in medical and pharmaceutical journals.<sup>12</sup> Twenty-four studies, conducted in 26 countries, were included in the review. The authors found that fewer than 67% of the claims were supported by a systematic review, meta-analysis or RCT, and that most of the advertisements with quantitative information presented effects with relative rather than absolute measures of risk. Dumville et al investigated advertisements relating to wound care products and identified 217 unique advertisements from 40 wound journal issues and 154 from 24 *British Medical Journal* (BMJ) issues.<sup>13</sup> Eighty-nine per cent of advertisements in the wound care journals and 84% in BMJ contained at least one product claim. In 35% of advertisements, the claims that were made cited at least one study, of which 33% were RCTs, compared to 63% of advertisements in the BMJ, of which 75% were RCTs.

In the field of nutrition, Lobb recently investigated the health claims of a mangosteen supplement in a case study, and found that claims “overstate the significance of findings, and fail to disclose severe methodological weaknesses of the research they cite”.<sup>14</sup> The author recommended that manufacturers of health products should include full disclosure of the size of the research, the duration, funding source and quality of research that is pertinent to product claims. Findings are in agreement with those of the current study, which showed that health claims in advertisements aimed at healthcare professionals were as common as those in advertisements which

targeted the general public, and that high-level evidence from systematic reviews and RCTs is infrequently cited.

Advertisements for nutritional supplements appear to be an important source of revenue for South African women's magazines. Therefore they will continue to be attractive to publishers. However, stricter control over the nature of advertisements, especially those with health claims, is needed. The findings of this study strengthen the case for regulation of the nutritional supplement industry. South Africa can learn from the experience in other countries where models of regulation have been adopted. Establishing criteria for permissible health claims requires support from good research evidence, and in the case of interventions, this means systematic reviews of RCTs. In the EU, for example, the main scientific criterion for scientific substantiation of health claims is "generally accepted scientific evidence (achieved) by taking into account the totality of the available scientific data, and by weighing the evidence".<sup>15</sup> This relates to specific study characteristics, which are similar to the criteria that were used to judge the appropriateness of cited research in this study.

Recently, van Loveren et al reflected on EU health claim assessments of prebiotic and probiotic supplements and pointed out that challenges include claims targeting healthy populations while most experimental studies have been conducted among patients.<sup>16</sup> In the USA, the FDA uses an evidence-based review system for the scientific evaluation of health claims.<sup>17</sup> However, following a number of legal challenges by manufacturers of dietary supplements, the FDA has been directed to allow dietary supplement claims that do not meet rigorous scientific criteria through a disclaimer that aims to reduce the claim's potential to mislead.

### Study limitations

The findings of this study were based on one sample of advertisements from women's magazines with the highest circulation figures (as in July 2010) and cannot necessarily be extrapolated to all advertisements of nutritional supplements in South Africa. Other popular magazines, such as *Huisgenoot* and *You* could also have been sampled. However, the authors of this study wanted to focus on a specific type of magazine and decided on women's magazines. They could just as easily have focused on health and fitness magazines or family magazines. The South African ABC has a list of registered women's magazines in South Africa. Therefore, the authors asked them to indicate the most popular five. In this way, the sample for this study was obtained from an independent body. The ABC regulates circulation figures, which differ from the SAARF's readership figures. A "reader" is defined as someone who reads or pages through all or parts of a magazine issue, irrespective of whether or not it is the person's copy or someone else's, or the latest issue or an old issue.<sup>18</sup> On the other hand, the circulation figure is the number of each issue (per month or averaged per year) that gets distributed to magazine subscribers and retailers.

Data extraction was performed by one person while a second person quality checked 25% of the data. Although no major discrepancies were found regarding health claims, quotes and the level and appropriateness of evidence, it would have been ideal to utilise data extraction that had been performed independently and in duplicate.

### Conclusion

Advertisements of nutritional supplements in five South African women's magazines are widespread and often contain health claims. The South African consumer should be protected against misleading advertisements. Therefore, urgent measures are needed in South Africa to improve the regulation of advertising and the sale of nutritional supplements. Basic knowledge of the principles of evidence-based health care and nutrition should also be promoted in South Africa to help consumers make informed decisions about disease prevention and self-medication.

### Conflict of interest

There was no conflict of interest.

### Declarations

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