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Individuals at risk of metabolic syndrome are more likely to use a variety of dietary supplements

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ABSTRACT

Background: It has been suggested that users of dietary supplements are likely to be people who are more health conscious. It is therefore conceivable that developing a metabolic disorder, such as diabetes, insulin resistance or hypertension, may make an individual more receptive to dietary supplement use. The aim of this study was to determine whether individuals with self-reported features of metabolic syndrome (FeMS) were more likely to use different dietary supplements compared with individuals without self-reported FeMS.
Method: In this cross sectional survey a total of 300 individuals working or studying in a UK university were invited to participate in the study. A self-administered questionnaire was used to collect data on demographics, health status, use of dietary supplements and lifestyle.
Results: A total o the 210 individuals completing the questionnaire, 32% ($n = 66$) were currently using or had used dietary supplements in the past 12 months. The five most common dietary supplements used were; multi vitamins (38%), fish oils (35%), calcium (26%), different herbal supplements (24%) and omega 3 oils (24%). Individuals with FeMS (defined as at least 1 self reported condition of; diabetes, hypertension, dyslipidaemia or obesity), ($n = 54$; 28%) were more likely ($P < 0.05$) to use different types of dietary supplements and less likely to report or discuss the use of dietary supplements with their general practitioner ($P = 0.043$) than those without FeMS.
Discussion: FeMS may be an independent predictor of dietary supplement use. Dietary supplement use is more common in older individuals and those with higher educational status.

1. Background

Dietary supplements are used as a form of nutrition not only by healthy individuals but also by patients with a variety of health issues. People tend to consider that dietary supplements are natural and safe and can help their symptoms, maintain health and prevent disease. Increased health awareness due to the presence of a chronic health problem may prompt people to use dietary supplements more so than those who are seemingly healthy. The use of dietary supplements has been increasing rapidly in the UK over the last decade [1]. Dietary supplements are widely available for purchase both in shops and from online vendors and sales of commercially available dietary supplements in UK have grown tremendously, and their variety and number continue to grow [2,3]. Up to 50% of adults take at least one dietary supplement [1], and in the UK 40% of women and 29% of men now take dietary supplements, compared with 17% of women and 9% of men 15 years ago [1]. The National Health and Nutrition Examination Survey (NHANES) 1999–2000 data, which are the most recent nationally representative data on comprehensive dietary supplement use, indicated that more than half of US adults aged 20 years or older took at least one dietary supplement [2].

The use of dietary supplements by older British people is increasing, and the use of these supplements frequently involves the several herbs [3]. More than 10% of the adults in England take herbal supplements and this is associated with age, gender, ethnicity and social class [4]. Furthermore the rise in the use of dietary supplements by the UK population can be attributed to several factors, including promotion via health programmes, awareness of dietary supplements, particularly by individuals

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with different health conditions, increased media publicity, a change in public attitude and training as a result of the increased availability of courses [5].

The use of different types of dietary supplements is of interest to epidemiologists because supplements can be an important exposure variable or a confounding factor for many diseases and disorders [6]. Differences in socio demographic and lifestyle characteristics between users and non-users of dietary supplements would demonstrate the importance of including a supplement assessment in both the planning and analysis of any epidemiological study investigating diet or lifestyle characteristics and health [6,9]. Many studies have extensively investigated dietary supplement use with respect to demographic and lifestyle factors. However, in recent years do not appear to have been studies conducted to compare patterns of dietary supplement use by individuals with or without specific health conditions; such as metabolic syndrome [9]. The consumption of dietary supplements may be determined by a combination of social, psychosocial, knowledge based, and economic factors. Surveys conducted in various developed countries suggest that personal use of dietary supplements is becoming widespread and increasingly popular [9–11]. However, little is known about dietary supplementation practices among those suffering from diabetes or hypertension or hypercholesterolemia or obesity. In the US and in Europe, nearly half of the adult population reported to use dietary supplement consumption [10]. It is possible that individuals who are aware of their metabolic disorder, such as diabetes or hypertension, may be more receptive to supplement use. The aim of this study was to determine whether individuals with self-reported FeMS were more likely to use different dietary supplements compared with individuals without self-reported FeMS.

2. Methods

The study l was approved by the Faculty of Health Sciences research ethics committee, University of West London (FREC31/Feb07). Participants were men and women aged 25 years or older and were selected from students and staff members at the University of West London, UK. The names and contact details of the staff ($n = 150$) and students ($n = 150$) were randomly chosen from University intranet and the questionnaires along with information sheets, consent forms and return envelopes were sent via university's internal post. A total of 300 individuals invited to participate in this study. Of these, 210 individuals completed the questionnaires, giving a 70% response rate.

3. Data collection

Participants were asked to complete a self-administered, semi-structured questionnaire which contained questions on their socio demographic characteristics, lifestyle characteristics, perceived health status and regular dietary supplement use in the past 12 months. A draft questionnaire was piloted on 5 staff members of the university and some minor alterations were made prior to formally undertaking the survey.

Information on socio-demographic data includes, age, gender, ethnicity, educational level and household income. Five age categories were created; 25–34, 35–44, 45–54, 55–64 and ≥65 years. According to the census UK [1,3], fifteen ethnic categories were defined: White British, White Irish, Other White, White and Black Caribbean mixed, White and Black African mixed, White and Asian mixed, other mixed background, Asian or Asian British Indian, Asian or Asian British Pakistani, Asian or Asian British Bangladeshi, other Asian background, Black or Black British Caribbean, Black or Black British African, other black background and Chinese. Five levels of education were used: secondary, college, university, postgraduate and others. Household income was categorised as GBP £0–9999, £10,000–14,999, £15,000–19,999, £20,000–29,000, £30,000–39,000, £40,000 and above. The use of any conventional over the counter medicines including non-herbal pain medicines such as paracetamol, ibuprofen, non-herbal; laxatives and any other over the counter medicines that did not meet the criteria for being a dietary supplements were excluded from the analysis.

4. Definition of features of metabolic syndrome (FeMS)

According to the Third Report of the National Cholesterol Education Programme (NCEP) Adult Treatment Panel (NCEP, 2001), the combination of abdominal obesity, type 2 diabetes mellitus, hyperlipidemia and hypertension have become characteristic of the condition known as Metabolic Syndrome [7]. Moreover, the diagnosis of Metabolic Syndrome is made when three or more of the following criteria's are present: (1) abdominal obesity consisting of a waist circumference greater than 40 in. (102 cm) for men or more than 35 in. (88 cm) for women, (2) triglyceride levels more than 150 mg/dL (1.7 mmol/l); HDL levels less than 40 mg/dL (1 mmol/l) in men or less than 50 mg/dL (1.3 mmol/l) in women, (3) blood Pressure ≥130/85 mmHg and (4) fasting plasma glucose levels ≥100 mg/dL (≥6.1 mmol/l).

Therefore, diagnosis of the above mentioned risk factors such as diabetes mellitus, high blood pressure, high blood cholesterol and obesity in this study was based on self-report and self-perception of respondents (having been informed about these metabolic disorders by a physician or being under pharmacological treatment). In this analysis the diagnosis of FeMS was defined by any individuals having at least one clinically diagnosed self-reported health condition of diabetes, hypertension, hyper-cholesterol or obesity. Furthermore, FeMS was also defined in previous studies [7,8].

5. Definition of dietary supplements

As per the US food and drug administration (FDA) (www.fda.gov/) guideline, a dietary supplement was defined as "a product intended for ingestion that contains a dietary ingredient intended to add further nutritional value to (supplement) the diet". "A "dietary ingredient" may be one, or any combination, of the following substances: (i) a vitamin, (ii) a mineral, (iii) an herb or other botanical supplement, (iv) an amino acid and (v) a dietary substance for use by people to supplement the diet by increasing the total dietary intake". Some dietary supplements can help to ensure that the individual obtains an adequate dietary intake of essential nutrients; others may help the individual to reduce your risk of disease.

6. Data analysis

All statistical analysis was performed using SPSS (version 15) software. The questionnaire was developed bearing in mind the requirements for cross tabulation and reporting. Cross tabulation yielded information about any potential correlations between dietary supplementation practices and socio-demographic and other dietary variables. The Chi square test was employed to test whether any correlations reached statistical significance. Two different methods of statistical analyses were performed in this study. Firstly, descriptive statistics and frequencies were used to calculate individuals with or without FeMS by using demographic characteristics and other variables. Secondly, individuals with FeMS were compared to individuals without FeMS by using cross tabulation/Chi square statistics. Results mentioned and discussed as 'significant' are statistically significant at the $P < 0.05$ level at 95% confidence interval.