Determining the practices and beliefs regarding nutritional supplement use in an urban adult population attending a medical centre in Rondebosch East, Cape Town.

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Abstract

Background

Empirical research on how and why nutritional supplements (including vitamin/mineral supplements and herbal supplements) are being taken by middle-income populations in South Africa is lacking. This study quantifies the types of nutritional supplements being taken. It unpacks beliefs regarding benefits and risks. This information is useful for healthcare practitioners in similar settings as it could affect their practice of history taking and alert practitioners to the need to know more about nutritional supplement benefits and risks. The information could be used to influence policy regarding advertising and labelling of nutritional supplements.

Method

The study was a cross-sectional survey. An anonymous self-completed structured questionnaire was completed by 123 participants attending a medical centre during the data collection period. Face-to-face semi-structured interviews were conducted on 16 participants to gather qualitative information.

Results

Nutritional supplements were widely taken in this questionnaire sample (59%). Consumption was not related to age, language, ethnic group, education and smoking, but nutritional supplements were more commonly used by women and higher income groups. Women who felt they had fair/poor health, women with chronic medical conditions, especially those with depression or women on chronic prescription medication were more likely to take nutritional supplements than those without these characteristics.

Wellness, treating tiredness and short-term disease prevention were the most common reasons for taking the supplements, although research proving these benefits is lacking. Chronic disease prevention was an uncommon reason for consumption. Participants were mostly unaware of possible drug interactions and side-effects and therefore felt it unnecessary to inform their practitioner of consumption habits.

Conclusion

Healthcare professionals should include a nutritional supplement question in their routine history taking, especially when prescribing chronic medication and in the presence of chronic conditions. They should be knowledgeable regarding efficacy, safety, possible side-effects and drug interactions of commonly consumed nutritional supplements in order to advise patients appropriately. Further empirical research is needed into proven benefits of nutritional supplements.

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Introduction

It is not known if and why nutritional supplements (including vitamin/mineral supplements and non-vitamin- non-mineral supplements, including herbal supplements) are being taken by the people who live in the community of Rondebosch East. No published studies regarding nutritional supplement use (prevalence or beliefs regarding intake) in a similar South African urban middle-income population could be found in a literature review. This study quantifies the types and amounts of nutritional supplements being taken and the associated beliefs regarding benefits and risks thereof. This information is useful for medical practitioners in similar settings as it could affect their practice of history taking and alert practitioners to the need to know more about nutritional supplements benefits and risks. The information could be used to influence policy regarding advertising and labelling of nutritional supplements.

Aim

To determine the usage, motivating factors and perceptions regarding nutritional supplement intake in the adult population attending a medical centre in Rondebosch East, Cape Town, a suburban middle-income community.

Objectives:

1. To establish who in this community takes nutritional supplements, which nutritional supplements they take and the frequency with which they take them.

2. To establish why people take nutritional supplements (perceived indications for use).

3. To determine where they received information about the benefits of the supplements they take (e.g. the media, a health professional, family/friends).

4. To find out if they have discussed these nutritional supplements with their health care professional

5. To determine whether they are aware of any potential risks of the supplements or potential interactions with other medication

Literature Review

This literature review is divided into 2 sections. The first section reviews studies on profiles of supplement users, correlations with certain behaviours, and reported

adverse events. The second section looks at the existing evidence regarding the benefits or risks related to the use of nutritional supplements.

Profile of supplement users

There are numerous studies looking at the prevalence nutritional supplement use in the developed world[1, 2, 3, 4]. Radimer[1] used data from the 1999-2000 National Health and Nutrition Examination survey (NHANES). This survey is a nationally representative, cross-sectional survey of US health and nutrition which analysed prevalence of dietary supplement use overall and its relation to lifestyle and demographic characteristics. It asked about dietary supplement use in the past month. It found that females, older age, higher education level, physical activity, non-Hispanic white race/ethnicity and never smoking were predictors of supplement use.

In a postal questionnaire Gordon and Shaffer[2] surveyed women who belonged to a specific health plan in Northern California. They found an 84 % prevalence of supplement use in the past 12 months for women over 65 years. Higher education, white, non-Hispanic and good health were predictors of higher consumption. Some conditions like arthritis and depression were associated with higher use of certain supplements and others like diabetes were associated with lower likelihood of use. This study suggests that surveys which employ one variable to represent presence of any chronic health problem may yield inaccurate results. Due to the high prevalence of use of supplements it was felt that research into safety and effectiveness of commonly used supplements is important (especially standards of product quality and recommended doses). It is also important to educate the public about becoming fully informed about safety, effectiveness and potential harmful effects of dietary supplements before starting their use.

Timbo BB[3] used data from the 2002 Health and Diet survey (a telephonic survey) and looked at prevalence as well as reports of adverse events (self-reported). Adverse events are difficult to monitor with nutritional supplements as there are not clear pathways for reporting. The findings showed 73% of non-institutionalised English-speaking US adults had used a dietary supplement in the previous 12 months and 4% of them reported an adverse event that they felt was due to the supplement. A higher proportion of supplement users with adverse events than users without adverse events were concurrently taking supplements *and* prescription drugs or *instead* of prescription drugs to treat or prevent a health condition.

These studies are mostly large US based studies looking at prevalence, rather than motivation for use. However one study by Singh[5] looked at the prevalence, patterns of usage and people's attitude towards complementary and alternative medicine (CAM) among the Indian Community in Chatsworth, South Africa. This paper is relevant to this study which also surveys a defined, small community in a suburb in South Africa. Using face to face structured interviews Singh examined health behaviour regarding CAM (including multivitamins) in a defined community, specifically looking at prevalence, patterns of usage, how they had heard about the CAM and perceived outcomes of use. Singh also looked at whether patients informed their doctors as to their use of CAM and concluded that patient –doctor communication needed to be improved and doctors should try to increase their attempts to take a CAM history (they suggested increased teaching about CAM in medical school curricula).

One qualitative study in the United States by Nichter[6] looked at supplement related practice from an anthropological perspective and found that Americans take nutritional supplements for a variety of reasons including health management, harm reduction, for resisting illness and managing illness. Patients often do not discuss

their nutritional supplements with their doctors as they “believe that the physicians knew little or nothing about these products and may be biased against them”. Dosing of nutritional supplements is seen as flexible and more in the control of the patient and side effects are considered uncommon.

The main insights of this literature review are that there is a high prevalence of nutritional supplement consumption. Different groups have different consumption habits. There is often failure to communicate consumption of nutritional supplements to health practitioners.

Evidence regarding efficacy and safety of nutritional supplements

Evidence that multivitamins are effective in preventing disease has been researched in numerous studies. In 2002 Fletcher and Fairfield[7] advised all adults to take a multivitamin to prevent chronic diseases pending the results of randomized trials. However since 2003 Haung et al.[8], the US Preventative Task Force[9] and Prentice et al.[10] found that that there is insufficient evidence to either support or advise against the use of multivitamin and mineral supplements by the general population to prevent chronic disease (including cancer and cardiovascular disease). These observations exclude use of specific vitamins for known deficiencies. Bjelakovic et al.[11] in a meta-analysis showed that there is no convincing evidence that antioxidant supplements have a beneficial effect on mortality. Beta-carotene, vitamin A and vitamin E seem to increase the risk of death and further trials are needed to assess the effects of vitamin C and selenium. A meta-analysis on the use of multivitamins to prevent infection in the elderly by El-Kadiki et al [12] found that the evidence was weak and conflicting. This meta-analysis does not support routine use of such supplements suggesting that further trials are needed.

Support of multivitamin use is presented by Barringer[13], who published results from a randomized, double-blind, placebo controlled trial looking at the effect of a daily multivitamin and mineral supplement on infection. The study found that multivitamin and mineral supplements reduced the incidence of participant-reported infection and related absenteeism in a sample of participants with type 2 diabetes and high prevalence of participant-reported infection. Larger studies are needed to see if these findings can be extrapolated to the entire population and not only diabetics.

These studies looked at their effect on the incidence of cancer and chronic diseases, infections, absenteeism and mortality. Studies which looked at the overall perception of improved “well-being” by nutritional supplements compared to placebo are lacking.

Study Design

A cross-sectional survey was used with a two pronged approach. Quantitative data was obtained from an anonymous self-completed structured questionnaire. This was offered to all clients attending the medical centre during the data collection period. Secondly, with a smaller sample of participants, face-to-face semi-structured interviews were conducted to gather more qualitative information on perceptions and beliefs regarding nutritional supplement use. By using 2 data collection instruments the reliability and convergent validity of the data was increased. There was methodological triangulation which confirmed trends and provided a more compete picture of the topic.

Study Population

The study population were residents of the suburb of Rondebosch East. Ideally the entire population of the suburb would have been sampled. However logistics (including safety of door-to-door interviews), cost and possible poor return of a mailed questionnaire restricted attempting this community-wide approach. Therefore attendees of a medical centre within the suburb were chosen as the study population. This was the best available representative sample of the community as a whole because:

- The centre offers a comprehensive range of private services including 3 medical doctors, pharmacy, physiotherapist, dentist, occupational therapist, midwife/baby clinic, psychologists and speech therapist.
- The area is a middle-income residential area with few people who only access day hospitals/state health care (there is no day hospital or clinic in the area).
- The suburb lacks a central meeting area (such as a shopping centre) where a similarly comprehensive group could be surveyed.

Nevertheless there is going to be a sample selection bias in this study because people who do not attend the centre will be omitted from the study. Reasons for not attending could include:

- They cannot afford any private health care (and only attend day hospitals or self medicate)
- They are very well with no need of any health services for themselves or their families
- People may only use complementary and alternative medicine (CAM) like homeopaths/ chiropractors/ kinesiologists.
- They work full time and cannot attend our practice during the hours it is open (8am-6pm).

The time of year and current common illnesses could cause a client selection bias. The time of year could also affect their recall of their most recent supplement use and influence the types of most recently used supplements. The sampling time was May and June a common time for coughs and colds.

Data collection

A pilot study was conducted at the medical practice with 20 questionnaires in English. After a preliminary statistical analysis of the results, the questionnaire was adjusted to accommodate ambiguities, allowing for ease of completion and optimal analysis of data. It was translated into Afrikaans, the other common language spoken at the practice.

All adult clients waiting for any service in the medical centre's waiting room between 8am and 6pm from 13-16 May 2008 were asked by the receptionists to complete the questionnaire. The receptionists were provided with a small monetary incentive to collect completed questionnaires, however completion of the questionnaire was entirely voluntary and there was no coercion to complete them. The inclusion criterion was any adult (over 18 years) who enters the medical centre on the days of the sample. It included people who had accompanied children/friends/relatives, but did not have an appointment themselves. Exclusion criteria were children, exceptionally sick (needing hospital admission) and those with a cognitive problems. Over this period 123 questionnaires were completed (121 in English and 2 in Afrikaans).

In depth face-to face interviews were conducted with 16 randomly selected clients waiting in the waiting room on the days of interviewing. The principal investigator was the interviewer. She was not seeing medical patients on the interviewing days. She approached any client waiting for in the waiting room and provided them with the informed consent to read. If there was time, they were interviewed before their appointment, otherwise afterwards. The acceptance rates for being interviewed was generally good, although lack of time or “not feeling like it” were used as reasons for declining the interview (n=3). The interviews were done until there was saturation of responses. The interviewees were given a choice of language (English or Afrikaans) in which to conduct the interviews. All 16 interviews were done in English.

The data of the questionnaire was captured by a data capturer and collated onto excel spreadsheets and analysed using Statistica. The interviews were recorded digitally onto a computer. Common ideas and threads from the interviews were summarised by the investigator.

Results

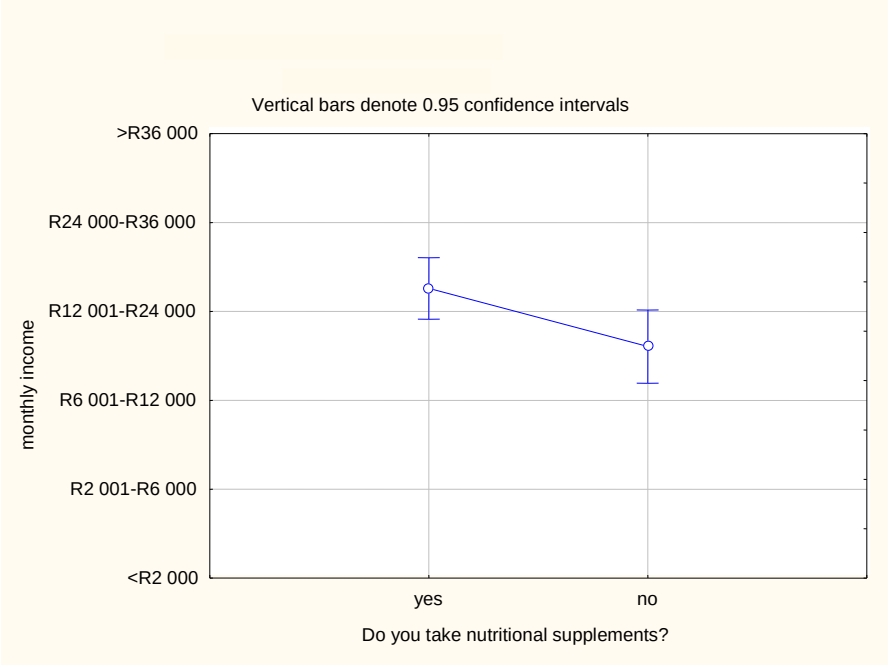
Profile of nutritional supplement users (Table 1 and Figure 1)

From the questionnaire 41% of respondents had not taken nutritional supplements in the previous 12 months and 59% had taken nutritional supplements. The probability of use differed significantly across gender, with females more likely to use nutritional supplements (p=0.000). Nutritional supplement use did not differ significantly across age, ethnic group, language, education, employment, and smoking categories. The proportion of respondents using nutritional supplements increased with income and the rank order association is significant at the 3% level (Mann-Whitney p=0.03)

Table 1: Profile of respondents who do and do not take nutritional supplements.

	Does not take nutritional supplements		Takes nutritional supplements		
	number	**%**	**number**	**%**	**Probability Statistics**
Taken NS in last 12 months	43	41%	62	59%	
Gender					
Male	24	69%	11	31%	Pearson chi-squared
Female	19	28%	50	72%	p=0.000
Age (Average years)	36.4		37.9		
Ethnic group					
Asian	4	36%	7	64%	Pearson chi-squared
Black	2	33%	4	67%	p=0.937
Coloured	24	43%	32	57%	
White	11	38%	18	62%	
Language					
Afrikaans	2	40%	3	60%	
English	38	40%	56	60%	Fisher's exact = 1
Xhosa	2	50%	2	50%	
Other	0	0%	1	100%	
Income					
<R2 000	2	100%	0	0%	
R2 001-R6 000	6	55%	5	45%	Fisher's exact = 0.212
R6 001-R12 000	8	44%	10	56%	Mann-Whitney p=0.03
R12 001-R24 000	14	44%	18	56%	
R24 000-R36 000	5	38%	8	62%	
>R36 000	3	19%	13	81%	
Education					
Less than Grade 12	10	71%	4	29%	
Completed Matric (Grade 12)	13	43%	17	57%	current effect p=0.09
Post school certificate/diploma	6	24%	19	76%	Mann-Whitney p=0.1
University degree or Technicon national diploma	14	41%	20	59%	
Employment					
Employed	33	47%	37	53%	Pearson chi-squared
Other	10	31%	22	69%	p=0.128
Smokers					
current smoker	14	70%	6	30%	
Total ex-smoker	7	33%	14	67%	Pearson chi-squared
non-smoker	22	35%	40	65%	p=0.017
current smoker	10	91%	1	9%	
Male ex-smoker	4	50%	4	50%	Pearson chi-squared
non-smoker	10	63%	6	38%	p = 0.129
current smoker	4	44%	5	56%	
Female ex-smoker	3	23%	10	77%	Pearson chi-squared
non-smoker	12	27%	33	73%	p = 0.500

Figure 1.Income using Mann-Whitney rank order test



Relationship between health status of respondents and nutritional supplement use. (Table 2)

Respondents were asked to grade themselves in terms of their perceived health status (excellent/very good/good/fair/poor). Those who considered themselves to be of poor/fair health were more likely to use nutritional supplements (p= 0.048). However this association can be attributed to the female gender sub-group, where the relationship was highly significant (p=0.001). The relationship in men is not significant (p= 0.467).

Respondents were then asked if they had any chronic or severe diseases (e.g. stroke, heart problems or previous heart attack, high blood pressure, diabetes, cancer, adult depression, problems with alcohol or drugs, arthritis or rheumatism and chronic pain). There was no relationship in the whole sample with taking a nutritional supplement and having chronic condition. However, if looked at by gender, women were more likely to take nutritional supplements if they have a chronic condition (1-sided Fisher's exact p= 0.037). 86% of women who suffer from any of the specified chronic illnesses use nutritional supplements, compared to 63% use of nutritional supplements by women without chronic medical conditions. In men there is no relationship (1-sided Fisher's exact p= 0.546).

When looking at specific conditions, depression in women, but not in men, had a relationship with taking a nutritional supplement (Fisher's exact = 0.052). For the other diseases the numbers were too small to be statistically significant.

Similarly, when looking at people on prescription medication, it was only when divided into gender that a relationship was elicited. Women on prescription medication were more likely to use nutritional supplements (1-sided Fisher's exact p = 0.016).

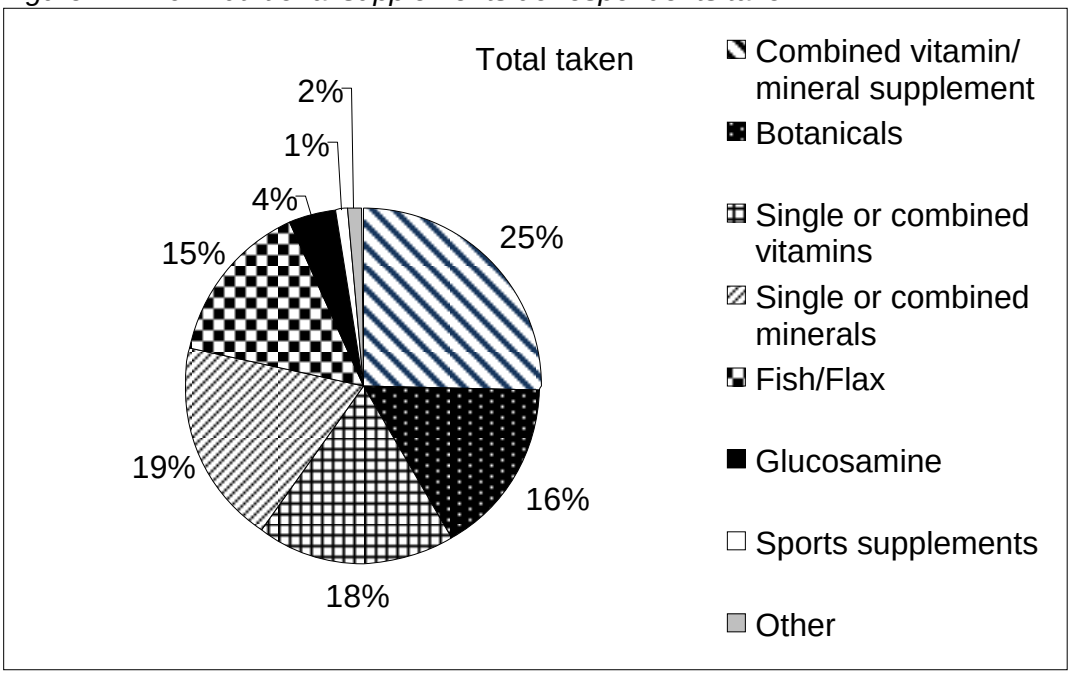
Table 2: Health related questions and nutritional supplements

		Does not take nutritional supplements number	%	Takes nutritional supplements Number	%	Probability statistics
Health						
Total	excellent/very good	25	52%	23	48%	Fisher exact p=0.048
	Good	14	35%	26	65%	
	fair/poor	3	19%	13	81%	
Male	excellent/very good	11	61%	7	39%	Fisher's exact p= 0.467
	Good	10	83%	2	17%	
	fair/poor	3	60%	2	40%	
Female	excellent/very good	14	48%	15	52%	Fisher's exact p = 0.001
	Good	4	14%	24	86%	
	fair/poor	0	0%	11	100%	
Have you suffered from any of the specified medical illnesses? [a]						
Total	No	27	46%	32	54%	Fisher's exact = 0.318 1-sided Fisher's exact = 0.175
	Yes	16	35%	30	65%	
Male	No	12	67%	6	33%	Fisher's exact = 1 1-sided Fisher's exact = 0.546
	Yes	12	71%	5	29%	
Female	No	15	37%	26	63%	Fisher's exact = 0.056 1-sided Fisher's exact = 0.037
	Yes	4	14%	24	86%	
Have you suffered depression?						
Total	Yes	7	27%	19	73%	Pearson chi squared p=0.088
	No	36	46%	43	54%	
Male	Yes	6	67%	3	33%	Fisher's exact = 1
	No	18	69%	8	31%	
Female	Yes	1	6%	15	94%	Fisher's exact = 0.052
	No	18	34%	35	66%	
Are patients who take chronic prescription medication more likely to take NS?						
Total	No	32	47%	36	53%	Fisher's exact = 0.143 1-sided Fisher's exact = 0.077
	Yes	11	31%	25	69%	
Male	No	15	71%	6	29%	Fisher's exact = 0.721 1-sided Fisher's exact = 0.467
	Yes	9	64%	5	36%	
Female	No	17	36%	30	64%	Fisher's exact = 0.022 1-sided Fisher's exact = 0.016
	Yes	2	9%	20	91%	

[a]. Specified illnesses include: stroke, heart problems or previous heart attack, high blood pressure, diabetes, cancer, adult depression, problems with alcohol or drugs, arthritis or rheumatism and chronic pain

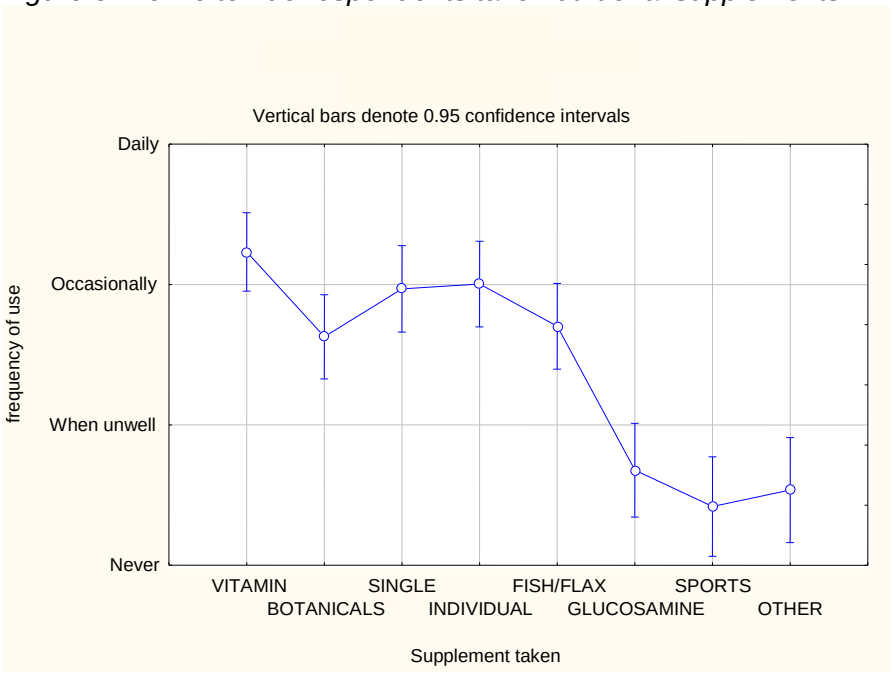
Which nutritional supplements do respondents take? (Figure 2)
Combined vitamin/mineral supplements were taken most often (25% of all supplements taken). Botanicals (16%), single or combined vitamins (18%), single or combined minerals (19%), fish or flax oils (15%) where all taken relatively frequently. Other supplements were taken infrequently.

Figure 2.Which nutritional supplements do respondents take?



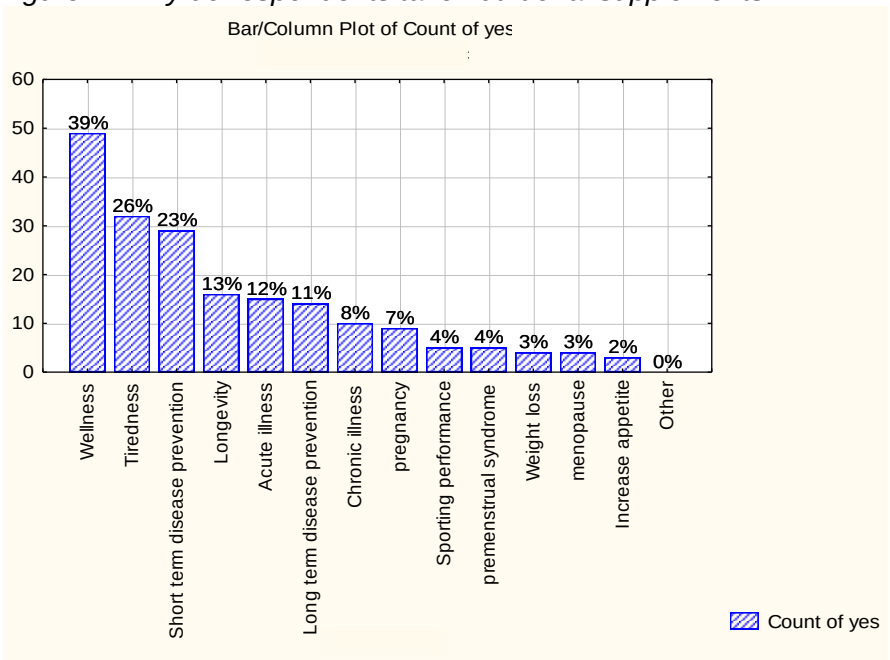
How often do respondents take nutritional supplements? (Figure 3)
Frequency of consumption varied according to type of supplement. Most supplements consumed were taken occasionally; except for the multivitamin/minerals which were taken more regularly (there is a trend towards daily consumption). Glucosamine and sports supplements were used infrequently.

Figure 3. How often do respondents take nutritional supplements?



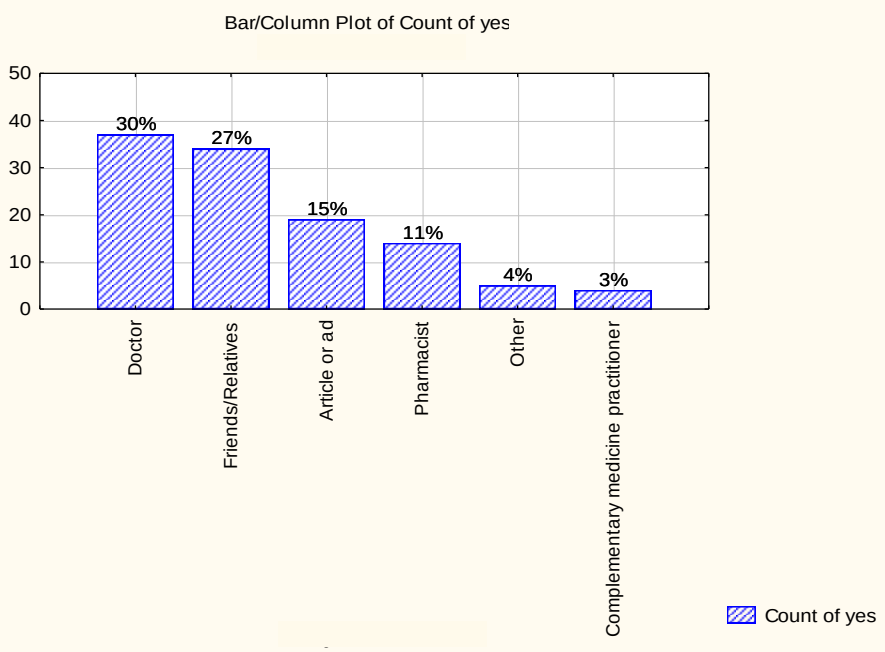
Why do respondents take nutritional supplements? (Figure 4)
More than one reason for taking nutritional supplements was permitted. The reasons most often given for taking supplements were “wellness” (39%), to treat tiredness (26%) and for short-term disease prevention (23%). Less common reasons given were longevity (12%), acute illness (12%) and long term disease prevention (11%). The least common reasons for taking nutritional supplements were for chronic illness, pregnancy, sporting performance, premenstrual syndrome, weight loss, menopause or increased appetite.

Figure 4. Why do respondents take nutritional supplements?



Where did respondents receive the information about the nutritional supplements? (Figure 5) and perceived side effects.
Most respondents of the questionnaire said information about the nutritional supplements was obtained from the doctor (30%) or friends and relatives (27%). Articles or advertisements influenced only 15% of respondents, the pharmacist 11% and complementary medical practitioners 3%. 55% said they had discussed taking the supplements they had taken with their medical practitioner. 84% of respondents who had used nutritional supplements believed that nutritional supplements had no side effects. 13% of them had experienced what they believed as side-effects from the supplements.

Figure 5. Where did respondents receive the information about the nutritional supplements?



Qualitative Data
The qualitative data gathered from semi-structured interviews suggested a higher consumption pattern than the quantitative data. 15 out of 16 people interviewed (94%) had taken nutritional supplements in the previous 12 months. 9 out of 15 consumers of supplements took them daily. Most often this was a combined multivitamin/mineral supplement. The higher “booster” doses of vitamins were taken occasionally to give energy in times of stress, when there was lots of work, when respondents were run down or to ward off infection. Commonly perceived benefits were increased energy levels, treating depression, “helping you through the day”, preventing illness, treating a perceived deficiency of nutrients in the diet, improving a feeling of well-being. One respondent said that supplements were “less costly and had less side effects” than doctor prescribed medicine and “kept the mind strong” Only one interviewee believed that taking the supplements would make them live longer.

The most common sources of information about nutritional supplements were family members, followed by pharmacists. 75% of respondents saw no need to inform the doctor about the supplements they were taking. Only 2 respondents had experienced side effects from the supplements, one “felt quite sick” after taking Echinacea and

another felt “shaky” after taking a high dose Vitamin B and mineral supplement. Some thought there may be side effects, but were not sure what they were. One respondent who had watched a TV documentary on supplements said that nutritional supplements “did not make you live longer” and “have no proven benefits”, however she still took daily multivitamins and saw no need to tell her doctor because “there were no side effects at recommended doses”. Another said that she had once mentioned a tonic she was taking to her G.P. and her G.P. had said that she was “not into tonics” so she had not discussed any further supplements she was taking with her. Another interviewee felt that doctors were not informed about nutritional supplements and so were not consulted.

Discussion

This sample is the most representative sample of the community in Rondebosch East that was available to the researcher. The high percentage of women in this sample could be explained because women are “traditionally primary health-care managers in their families” [6] and therefore would be expected to be more prevalent in a primary health care setting. It is difficult to extrapolate the results to the whole Rondebosch East population, but the results may be seen to be representative of people who attend private medical centres in similar communities.

The profile of nutritional supplement users

In this questionnaire sample 59% had taken a nutritional supplement in the last 12 months. This is lower than the findings of Timbo [3] in the 2002 Health and Diet survey which showed 73% of non-institutionalised English speaking US adults had used a dietary supplement in the previous 2 months. One factor suggested for this is less aggressive marketing of nutritional supplements in South Africa. 94% (15 out of 16 respondents) of those interviewed had taken a supplement in the previous 12 months. This may reflect a patient selection bias (those willing to be interviewed were more likely to have an interest in the topic and therefore higher consumption habits) or the interviews allowed more time to recall products consumed. There are no comparative statistics in the total South African population to compare these figures to.

When eliciting the profiles of nutritional supplement users, some trends emerge. It is clear that women are far more likely to take nutritional supplements than men (72% compared to 31%, chi-squared p=0.00). This is supported in the NHANES study from the United States[1] where females, older age, higher education level, non-Hispanic white race/ethnicity and never smoking were predictors of supplement use[1]. In this study however; age, ethnic group, language and education are not significantly associated with nutritional supplement use. There is a trend towards higher use of nutritional supplements in people of higher income which is also supported by international studies[1].

Smoking and nutritional supplements

On first analysis being a current smoker looked like it was associated with not taking nutritional supplements and ex-smokers or non-smokers were more likely to take nutritional supplements. However, when broken down by gender no relationship is evident. The apparent negative relationship between smoking and nutritional supplements reflects the fact that men are more likely to smoke and men less likely to take nutritional supplements.

Relationship between health status and taking of nutritional supplements

Women who feel they have fair/poor health, women with chronic medical conditions, especially women with depression and women on chronic prescription medication are all more likely to take nutritional supplements than those without these

characteristics. This is in keeping with international studies[2] which found some conditions, like arthritis and depression, were associated with higher use of certain supplements.

Reasons for taking nutritional supplements compared to international trends
39% of the sample who took nutritional supplements took it for wellness and 26% took it to treat tiredness. Prevention of short term illness was a reason given in 23% of the sample. Long term disease prevention (11%) and longevity (13%) seemed to be lesser reasons for taking the supplements. In America "supplement use appears to have become a common means by which Americans engage in wellness, protect them selves from illness and treat disease"[6].In this study respondents take the supplements for short term benefits rather than long term disease prevention. This is appropriate because current evidence-based research suggests that nutritional supplements do not protect you against chronic disease[8, 9, 10, 11] Research into subjective benefits like wellness and treating tiredness were not found in the literature review.

Where did respondents get information about the nutritional supplements?
It appears that most of the sample completing the questionnaire either received information from the doctor (30%) or friends/relatives (27%). This may be a skewed result because respondents wanted to give the "correct" answer knowing a doctor was doing the study in a medical centre. Only 15% admitted to being influenced by the media. In the interviews it appears that family and friends or the pharmacist were the most common sources of information. Advertisements for supplements are often highly targeted (gender-based, age-based, performance-based), however in a qualitative study in the US "most men as well as women we talked with denied being strongly influenced by advertisements for supplements"[6]. They found that if a friend had successfully tried a product it was more convincing than if an advert suggested it. The interviews conducted suggested this too, with many people trying things because it was recommended by a friend or relative.

Have the respondents discussed these nutritional supplements with their health care professional?
55% of the questionnaire sample said they had discussed taking their nutritional supplements with a health care professional. This could be a biased result because the study was being conducted in a medical centre and by a medical doctor. In the interviews the majority of respondents said that they had not discussed using nutritional supplements with their doctor because they "didn't think it was necessary".

To determine whether they are aware of any potential risks of the supplements or potential interactions with other medication
In the study population knowledge about potential side-effects of nutritional supplements seemed to be very limited. 84% of the sample who had taken nutritional supplements were not aware of any potential short or long term side effects of nutritional supplements. 13% had experienced side-effects themselves (they were not asked to grade the severity of the side-effects). This is higher than in an international study[3] which showed 4% had experienced adverse events that they felt were due to the nutritional supplements. In the qualitative study most interviewees believed that vitamin and mineral complexes were a completely safe and had no maximum dose. Others thought that at normal doses there could be no adverse effects, but some could be experienced at high doses. Some interviewees mentioned that herbal supplements may have side effects, although few knew what they were.

Conclusion

This study was conducted in a private primary practice setting in an urban middle-income area in South Africa. Nutritional supplements were widely taken in this questionnaire sample (59%), mostly by women and those in higher income groups. Women who felt they had fair/poor health, women with chronic medical conditions, especially women with depression and women on chronic prescription medication were all more likely to take nutritional supplements than those without these characteristics. 55% of those completing the questionnaire said that they had discussed taking the supplement with their healthcare practitioner. However in the interviews it was elicited that the practitioners did not usually ask about supplement use. Respondents, because they were mostly unaware of any possible interactions and side effects, did not feel it was necessary to inform their practitioner. Practitioners were also felt by the respondents to be uninformed about nutritional supplements.

Medical practitioners should be alert to high consumption habits in patients in these profile groups. Asking a nutritional supplement consumption history in the general medical history questionnaire should become routine. Medical practitioners should be knowledgeable about scientifically proven evidence regarding efficacy, safety, possible side-effects and drug interactions of commonly consumed nutritional supplements or they should know where to find such information.

Legislation should ensure that possible side-effects and drug interactions are on the packaging of nutritional supplements. These should be easy to understand by the lay person. Claims about potential benefits should also be limited to what is known through systematically reviewing the evidence.

From this study it is clear that more research needs to be done into establishing exactly what are the health benefits and risks of taking nutritional supplements. For this well-designed large studies need to be done. Studies looking at the perceived benefits of “wellness”, preventing tiredness and prevention of acute illnesses would be useful. The South African population does not have the same consumption patterns as the rest of the world, so further studies into South African consumption patterns would be useful to know for health practitioners and regulators.

Acknowledgments
Prof Martin Kidd, statistician, University of Stellenbosch

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Appendix 1: Questionnaire

Nutritional Supplement Survey

You have been invited to participate in a survey which is attempting to understand the practices and beliefs regarding nutritional supplement use in the urban adult population attending this medical centre. This will be useful to the medical fraternity as the extent of consumption in the general population in South Africa of these products is not known. By completing the study you will help us to learn about health-related behaviour of our patients and allow us to make decisions about our current practices.

The study forms part of a Master's degree in Family Medicine through the University of Stellenbosch and has been approved by the Committee for Human Research (Ethics) of the university.

- **The questionnaire is anonymous and confidential.**
- **Please only complete it if you are 18 years old or older.**
- **By completing and handing in the questionnaire you are consenting to your answers being used in the study, however at no stage will your answers be identifiable to your person as your name will not be on the answer sheet.**
- **Participation is voluntary; you are under no obligation to complete the survey.**
- **Your medical care will not be affected in any way should you decide not to participate.**
- **There is no remuneration for participating.**
- **Completing the questionnaire should only take 5 minutes.**
- **An Afrikaans version of this questionnaire is available from reception.**

Thank-you for your time.

Regards,

Dr Anna Frost MBChB DCH (Principle Investigator)

e-mail: drfrost@willowmead.co.za telephone: +27 21 6968571

Supervisor: Prof P De Villiers, Head of Department of Family Medicine,

email: pjtdv@sun.ac.za telephone: +27 21 9389449

Section A

1. In general would you say your health is (tick appropriate box):

excellent	very good	good	fair	poor

2. Have you ever had:

	YES	NO
A Stroke		
Heart problems or heart attack		
High blood pressure (hypertension)		
Diabetes (except diabetes during pregnancy)		
Cancer (specify type)		
Adult depression (lasting more than 2 weeks)		
Problems with alcohol or drugs		
Arthritis or rheumatism		
Chronic (ongoing) pain		
Other chronic disease (please specify) ……		

3. Do you take chronic (long term) prescription medication?

YES	NO

If yes, can you name those medications?

_____

_____

4. In the last 12 months have you taken any nutritional supplements (see question 5 for possible examples)?

YES	NO

If NO go to question number 13 (Section B).

5. Which ones of the following **nutritional supplements** have you taken in the last 12 months to treat or prevent health problems? You can choose more than one. If possible please provide the trade name of the supplement you take. Please indicate how often you have taken them by ticking the relevant columns.

	Daily	Occasionally	Only when unwell	Never
VITAMIN AND MINERAL COMBINATIONS (e.g. DS24, Berocca, Vital Multitime, Pharmaton, Ciplaton, Centrum, Vita-Thion, Sypradyn, Bioplus, B-Cal-DM) **Specify**: ……				

BOTANICALS, HERBS, AND HERBAL MEDICINE PRODUCTS (e.g. Echinacea, Viral Guard, Viral Choice, ginseng, gingko, St John's Wort, Spirulina, Procydin, garlic (not as food), Evening Primrose Oil, Herbalife products, cinnamon extract, Cell Food, herbal menopause supplements) **Specify**: ……				
SINGLE or COMBINED VITAMINS (e.g. Vitamin C, Vitamin E, Vitamin B12, Vitamin B Co) **Specify**: ……..				
INDIVIDUAL OR COMBINED MINERALS (e.g. calcium, copper, iron, zinc, folic acid, calcium and magnesium combined e.g. CalMag)) **Specify:**…….……..				
FISH/FLAX OILS (Omega 3 and/or 6)				
GLUCOSAMINE AND/OR CHONDROITIN SULPHATE FOR ARTHRITIS (e.g. ArthroChoice, Arthro-eze, ArthroGuard, Flexeze, Osteo-eze, OsteoFlex etc.)				
SPORTS SUPPLEMENTS **Specify:** ….…….				
OTHER NUTRITIONAL SUPPLEMENT **Specify**:…….....				

6. Why have you taken these supplements? (You can choose more than one):

Acute (short term) disease prevention (for instance to stop you getting a cold)	
Chronic (long term) disease prevention (for instance to stop you getting heart disease or cancer)	
Treatment of acute illness (for instance when you already have a cold e.g. Ecchinacea, Viral Guard)	
Treatment of chronic illness (for instance as treatment for diabetes, cancer or arthritis)	
Longevity (a longer life)	
General wellness	
To treat tiredness	
Weight loss	
To increase appetite	
To improve sporting performance	
For pregnancy	
For premenstrual syndrome symptom relief	
For menopause symptoms	
Other (please specify)……..	

7. Are you aware of any possible unwanted side-effects/long term effects of the supplements you take?

YES	NO

Specify if possible:

_____

8. Have you ever experienced any side effects that you believe were from nutritional supplements?

YES	NO

9. How much do you spend per month (on average) on these supplements?

Less than R100	
R100-R300	
More than R300	

10. On whose advice did you take these supplements? (you can choose more than one)

Doctor	
Pharmacist	
Complementary medicine practitioner	
Article or advertisement in a magazine, newspaper or on TV	
Friends/Relatives	
Other (please specify)	

11. Have you discussed taking nutritional supplements with your doctor, pharmacist or other healthcare professional?

YES	NO

12. Have you, in the past 12 months, taken a nutritional supplement to delay seeking medical advice?

YES	NO

Section B: Personal Information

13. Are you:

MALE	FEMALE

14. How old are you? _____

15. What typical South African ethnic group would you classify yourself as?

ASIAN	BLACK	COLOURED	WHITE

16. What is your home language?

AFRIKAANS	ENGLISH	XHOSA	OTHER

17. What is the average monthly income of your household?

<R2 000	
R2 001-R6 000	
R6 001-R12 000	
R12 001-R24 000	
R24 000-R36 000	
>R36 000	

18. What is your highest education level?

Less than Grade 12	
Completed Matric (Grade 12)	
Post school certificate/diploma	
University degree or Technicon national diploma	

19. What is your employment status? (Select only one)

Employed	
Looking for work, but unable to find work	
Studying	
Homemaker	
Retired	
Not working for health reasons	
Other	

20. What is your smoking status?

CURRENT SMOKER	EX-SMOKER	NEVER SMOKED

Thank-you for participating in this survey. Please deposit the completed survey in the box next to reception.

Appendix 2: Informed Consent for interviews

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

Determining the practices and beliefs regarding nutritional supplement use in an urban adult population attending a medical centre in Rondebosch East, Cape Town.

REFERENCE NUMBER: N07/08/191

PRINCIPAL INVESTIGATOR: Dr Anna Frost

ADDRESS: Willowmead Medical Centre, 88 Kromboom Road, Rondebosch East, 7780

CONTACT NUMBER: 021 6968571

You are being invited to take part in a research project that forms part of a Masters Degree in Family Medicine at the University of Stellenbosch. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Committee for Human Research at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

The aim of the project is to try to elicit what the practices and beliefs regarding nutritional supplements are amongst people attending Willowmead Medical Centre. This will be useful to the medical fraternity as the extent of consumption in the general population in South Africa of these products is not known. Participants are randomly selected from people visiting the centre. We hope to conduct about 30 interviews.

Why have you been selected to participate?

You have been selected to participate as a random attendee of the centre.

What will be expected from you?

All that is required of you is your time (about 30 minutes) to participate in the interview. Your responsibilities include being honest with the interviewer and being willing to give of your time.

You will not be expected to take any medication and there will be no procedures. You have been invited to participate because we are interested in your views and usage of nutritional supplements.

Will you benefit from this research?

You may not benefit directly from participating; however the results will hopefully increase awareness in our medical centre and other medical centres of the consumption and beliefs regarding these supplements. This knowledge could make your doctors more alert to possible side effects or drug interactions. The information may be used to help motivate for regulation of the nutritional supplement industry.

Are there any risks involved?

There are no risks to participating. Participation is voluntary. Should you chose not to participate you will be free to do so and it will not affect your care in the centre in any manner.

Who will have access to responses?

The information collected will remain confidential and be protected. Only the principal investigator will be able to identify your responses. If the information is used in a publication or thesis the identity of all participants will remain anonymous.

Will you receive any compensation for your participation?

You will not be remunerated for your time; however there will be no cost to you if you do take part.

Is there any thing else that you should know or do?

- You can contact Dr Anna Frost at 021 6968571 if you have any further queries or encounter any problems.
- You can contact the Committee for Human Research at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by your study doctor.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I ……..……. agree to take part in a research study entitled: **Determining the practices and beliefs regarding nutritional supplement use in the urban adult population attending a medical centre in Rondebosch East, Cape Town**

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

Signed at (*place*) .....…..……. on (*date*) ……...……..

....
Signature of participant **Signature of witness**

Declaration by investigator

I *(name)* ……..…… declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above

Signed at (*place*) .....…..……. on (*date*) ……...…….. .

....
Signature of investigator Signature of witness