

SOCIO-DEMOGRAPHIC PREDICTORS AND REASONS FOR VITAMIN AND/OR MINERAL FOOD SUPPLEMENT USE IN A GROUP OF OUTPATIENTS IN SKOPJE

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Abstract: *Background:* Vitamins and/or mineral food supplements (VMS) are mono- or multi-component products prepared in different pharmaceutical forms and categorized as food supplements. Numerous researchers have investigated the epidemiological predictors of use of VMS in population. Data of this kind in our setting are limited.

Aims: This survey aimed to gain information on the prevalence of use, certain socio-demographic predictors and reasons for VMS use in a group of 256 outpatients in Skopje.

Materials and methods: This study was designed as an open-ended, cross-sectional survey. Data on VMS use were collected by survey method with a specially designed questionnaire as an instrument for this research. Appropriate statistical tests were used to analyse the data.

Results: Data from 256 outpatients from Skopje were analysed. Of them, one hundred and five (41.02%) reported using VMS. Female outpatients ($p < 0.01$) and participants of Macedonian ethnicity ($p < 0.01$), with a higher educational level ($p < 0.01$) and those having their own income ($p < 0.05$) reported significantly higher consumption of VMS. We found a statistically significant difference between the group of users and non-users of VMS regarding smoking status ($p < 0.05$), alcohol consumption ($p < 0.05$) and presence of a chronic disease ($p < 0.01$).

Physicians, magazines and friends were the most common source of information on VMS while maintaining good health and prevention of disease was the most common reasons for the use of these products. Only 63% of the users had disclosed the information on taking VMS to their physicians.

Conclusion: This research provided an insight into VMS in our setting. Predictors on the use of VMS are of interest since these products contribute to total intake of vitamins and minerals in the population and they represent a source of valuable information when planning public health activities.

Key words: sociodemographic predictors, vitamins, minerals, food supplements.

Introduction

Commercially available vitamin and/or mineral supplement use is widespread in many populations and there is a trend of its increase. The percentage of United States adults using any vitamin/mineral supplement daily increased from 23.2% (1987) to 23.7% (1992) to 33.9% (2000). This pattern was consistent for both genders, all race/ethnic groups, and adults aged ≥ 25 years [1]. Latest data show that prevalence of VMS users may be as high as 56.5% in the United States [2].

The prevalence of dietary supplement users depends on the population studied as well as the definition of supplements and survey methods used.

Many epidemiological studies have found associations between VMS use and demographic factors such as gender, age, ethnicity, place of living socio-economic status as well as with life-style habits (alcohol consumption and smoking) and health status [1, 3, 4].

Knowledge of the population's supplement use is essential in research on the relationship between nutrition and disease because a considerable percentage of a person's micronutrient intake may come from supplements. Moreover, it is important to monitor total nutrient intake to assess adequate as well as excessive intakes in the population [5].

Furthermore, many studies have confirmed the positive role of supplementing the diet with VMS in some specific groups of the population. After it has been well documented that supplementation of the diet before conception and the first months of pregnancy with 400 $\mu\text{g/day}$ of folic acid reduces the risk of neural tube defects, many researchers focused on studying the prevalence and predictors of the use of folic acid-containing supplements among women [6, 7, 8]. Although osteoporosis treatment guidelines include recommendations for calcium and vitamin D intake, routine use of adequate supplementation is often low. This is the case even when vitamin D and calcium supplements are provided free with osteoporosis drug prescriptions, as occurs in Austria [9].

There are numerous products containing vitamin and/or minerals that are categorized as food supplements on the market in R. Macedonia. Data on the prevalence and sociodemographic predictors of the users of VMS and reasons for their use in our setting is very limited. Therefore, the current study was undertaken to fill this gap in the literature.

Aim of the study

The objective of the current study was to determine the prevalence of vitamin and mineral supplement use in a group of outpatients from Skopje, and assess its association with demographic and lifestyle factors as well as the reasons for their use.

Methods

The study was designed as an open-ended cross-sectional survey.

We recruited the participants randomly and surveyed outpatients above the age of 18 in general practitioner surgeries located in the city of Skopje including the suburbs. The respondents surveyed visited their general practitioner either because of an acute or chronic illness or just for a consultation without having a complaint about their health.

Inclusion criteria for participation in the study were age above 18, being a citizen of Skopje or the suburbs and willingness of the subject to take part in the survey. Non-inclusion criteria were being aged below 18, not being a citizen of Skopje or the suburbs and unwillingness or inability of the subject to participate in the study.

After the aim of this investigation had been explained, respondents were asked to fill in the questionnaire that we had previously self-designed for this research on the basis of known indicators. The questionnaire consisted of three parts. In the first part, the participants had to fill in general sociodemographic data (age, gender, ethnicity, marital status, education, place of living and income status). In the second part of the questionnaire, the participants were asked if they had used any vitamin and/or mineral supplement during the past month. There were also questions about the type of products used, main sources of information about these products, the place of their purchase and the reasons for use of these supplements). The third part of the questionnaire recorded information on two lifestyle factors – tobacco and alcohol consumption and data on personal history of disease. In this section of the questionnaire, the participants also had to answer if they had informed their physician on the use of VMS.

In the questionnaire, the education level was categorized into four groups: primary education, secondary school level, university degree and post-graduate degree. Participants who had attained only 4 years of primary education were included in the primary education level group.

Smoking status was categorized into current smoker, former smoker and never smoked. Alcohol consumption was present if the subject answered positively to the question 'Do you currently drink alcoholic beverages?'

The criteria for defining users of VMS were adopted from a previously published manuscript [4]. Regarding use of these products, each participant was asked "In the past month, did you take vitamins/minerals". Users of dietary supplements were defined as subjects who used at least one vitamin or mineral supplement over the previous month. The reasons for use of VMS were also recorded.

In the statistical analysis, between-group comparisons (users versus nonusers) were made using Chi square test for qualitative variables. Statistical significance was assessed for $p \leq 0.05$.

Results

Our survey included 256 outpatients, 61.72% of whom were female and 98 (38.28%) males. The average age of the participants was 40.3 ± 15.3 years. Most of the patients, 211 (82.42%), were Macedonians, 20 patients (7.81%) were Albanians and 25 (9.77%) were of other ethnicity). More than half the participants were married –141 (55.08%) and the rest 106 (44.92%) were not married (claimed to have never married, were divorced or widowed). Of all the participants in this study, 28 (10.92%) had graduated from elementary school, 90 (35.16%) participants held a high school degree, 129 (50.39%) held a university degree and 9 (3.53%) patients held a post-graduate degree. Most of the respondents in this survey, 205 (80.08%), lived in urban neighbourhoods of the city of Skopje and the remainder, 51 (19.92%), lived in suburb neighbourhoods of Skopje. In our investigation, 184 (71.88%) of the respondents had their own income (were employed or retired receiving a pension) and the remaining 62 respondents (18.22%) did not have their own income (were either not employed or were students).

The prevalence of use of vitamin and mineral food supplements in our study was 41.02% (105 respondents claimed to be users and 151 (58.98%) presented as non-users of these products).

Most of the users, 64 (61%), used more than one VMS product. Forty-one participants (39%) of all users indicated using only one type of VMS. The most commonly used products in our survey were multicomponent products containing several vitamins (multivitamin food supplements) and these were

consumed by 60 users. Supplements containing Vitamin C were consumed by 35 users, Vitamin B supplements by 19 users, Calcium supplements by 14 users, Magnesium by 7 users, Zinc by 4 users, multimineral supplements by 4 users, Selenium by 3, Co-enzyme Q10 by 2 users and Germanium 132 by 1 user.

Associations between use of vitamin/mineral food supplements with gender, ethnicity, and marital status, education, place of living, and income status are presented in Table 1 below:

Table 1

Association between vitamin/mineral supplementation status with some sociodemographic predictors

	Users	Non users	Total	Chi Square results
Gender				
Males	28 (10.94%)	70 (27.34%)	98 (38.28%)	chi square (Yates) = 9.35; df = 1 p = 0.0022 and p < 0.01
Females	77 (30.08%)	81 (31.64%)	158 (61.72%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Ethnicity				
Macedonians	97 (37.9%)	114 (44.52%)	211 (82.42%)	chi square = 12.96; df = 2; p = 0.0015 and p < 0.01
Albanians	5 (1.95%)	15 (5.86%)	20 (7.81%)	
Others	3 (1.17%)	22 (8.6%)	25 (9.77%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Marital status				
Married	54 (21.1%)	87 (33.98%)	141 (55.08%)	chi square (Yates) = 0.72; df = 1; p = 0.395 and p > 0.05
Not married	51 (19.92%)	64 (25%)	106 (44.92%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Education				
Elementary	5 (1.95%)	23 (8.97%)	28 (10.92%)	chi square = 11.46; df = 3; p = 0.009 and p < 0.01
High school	33 (12.9%)	57 (22.26%)	90 (35.16%)	
University	61 (23.83%)	68 (26.56%)	129 (50.39%)	
Post-university degree	6 (2.34%)	3 (1.19%)	9 (3.53%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Place of living				
Urban	88 (34.38%)	117 (45.7%)	205 (80.08%)	chi square (Yates) = 1.18; df = 1; p = 0.277 and p > 0.05
Suburbs	17 (6.64%)	34 (13.28%)	51 (19.92%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Income status				
Own income	88 (34.38%)	96 (37.5%)	184 (71.88%)	chi square (Yates) = 7.08; df = 1; p = 0.0078 and p < 0.05
Do not have own income	17 (6.64%)	45 (11.58%)	62 (18.22%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	

We did not find a statistically significant association either between marital status or place of living with use of VMS ($p > 0.05$). On the other hand, we did find that VMS products were much more commonly used by female respondents, compared to males ($p < 0.01$), in respondents of Macedonian ethnicity ($p < 0.01$), in patients with higher educational status ($p < 0.01$), and in those having their own income ($p < 0.05$).

As presented in Table 2 below, we found that there was a statistically significant difference between the two groups (users and non-users of VMS) regarding cigarette smoking status ($p < 0.05$), alcohol consumption ($p < 0.05$), and presence of a chronic disease ($p < 0.01$):

Table 2

Association between vitamin/mineral supplementation status with smoking status, alcohol consumption and presence of a chronic disease

	Users	Non users	Total	Chi Square results
Smoking				chi square = 8,623; df = 2; p = 0,0134 and p < 0.05
Yes	21 (8.2%)	54 (21.1%)	75 (29.3 %)	
No	74 (28.91%)	90 (35.19%)	164 (64.1%)	
Former	10 (3.91%)	7 (2.69%)	17 (6.6%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Alcohol consumption				chi square (Yates) = 4,67; df = 1; p = 0.0307 and p < 0.05
Yes	35 (13.67%)	72 (28.13%)	107(41.8%)	
No	70 (27.35%)	79 (30.85%)	149 (58.2%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	
Chronic disease				chi square (Yates) = 8.06; df = 1; p = 0.0045 and p < 0.01
Yes	45 (17.58%)	38 (14.84%)	83 (32.42%)	
No	60 (23.44%)	113 (44.14%)	173 (67.58%)	
Total:	105 (41.02%)	151 (58.98%)	256 (100%)	

Physicians were the most common source of information for these products both among users and non-users, followed by magazines, friends and television as shown in Table 3.

Table 3

Source of information on VMS among users and non-users

Sources of information on VMS*	Users	Non-users	Total
Physician	40	28	68
Pharmacist	18	8	26
Natural products' shop assistant	3	3	6
Friends	29	14	43
Magazines	40	21	61
Internet	16	11	27
Television	21	20	41
Radio	6	4	10
other	7	2	9
No information on VMS products	0	45	45

*More than one information source could be cited by participants.

The most common reasons for use of VMS were prevention of disease and maintaining good health, as presented in Table 4.

Table 4

Reasons for use of vitamin/mineral supplements

Reasons for use of vitamin/mineral supplements VMS*	Number of answers by the users
Keeping the good health and prevent diseases	53
Enrichment of the diet	24
Gaining more energy	8
Feeling and looking better	12
Other (like the taste or flavour, refreshment, feeling in good mood)	9
No specific reason	25
Total	121

*More than one reason could be cited by participants.

The results of the question presenting flow of information on VMS consumptions between doctors and their patients are shown in Table 5. Only 60 (63%) of the users had informed their physician on the use of these products and the rest 45 (47%) had not disclosed this information to their physicians.

Table 5

Answer to the question: "Have you informed your physician on the use of VMS"

Answer to the question: "Have you informed your physician on the use of VMS"	Users of VMS
Yes	60 (63%)
No	45 (47%)
Total	105 (100%)

Discussion

In the current study, the prevalence of dietary supplement use and its association with demographics, lifestyles, and health status were investigated.

Forty-one percent (41.02%) of the subjects surveyed reported using VMS. Our results were very similar to the results of the study conducted by Guo X *et al.* 2009 [4] where the prevalence of vitamin and mineral supplement use among adult Canadians was 40.1%.

Consistently with the data from other researchers [10–13], our survey demonstrated that females, respondents with a higher educational level, and those of higher socio-economical status were more likely to use vitamin and mineral supplements. The fact that these products are more commonly used in sectors of the population with higher socio-economic status and education [11] leads to the conclusion that it is the population of lower socio-economic status that is at higher risk of dietary inadequacy (vulnerable population) and may benefit most from using VMS, uses them the least.

Consistent with the findings of other researchers [3, 13, 14], the use of VMS was also significantly associated with some lifestyle habits such as smoking and alcohol consumption.

The results of our study showed that about 47% of users of VMS had not informed their physician on their consumption of these supplements. Several authors have shown that use of nutritional supplements including VMS is usually without any specialized professional guidance and based primarily on self-prescription [15]. Research conducted by Hensrud DD *et al.* 1999 [16] con-

cluded that patients should be specifically asked about use of dietary supplements and non-prescription medications, since that information is often not disclosed by the patient. Our finding confirms this conclusion.

In our research, presence of a chronic disease was significantly associated with use of VMS among the outpatients in our survey. Although some researchers have found a positive association between supplement use and self-reported health status, [17, 18] others have found no significant association [2, 19].

Consistently with finding from other researchers [17, 20, 21], physicians were most frequently reported as the information source for vitamin/mineral preparations in our study followed by other popular information sources such as magazines, friends and television.

Our study confirmed our previous findings [22] that outpatients are concerned about their health and are willing to take steps on a personal level to "maintain good health" and "prevent disease". Those were the most commonly reported reason for VMS consumption, followed by "enrichment of the diet". VMS were also used for "gaining more energy" as well as for "feeling and looking better", which is in consistence to findings from other studies including those conducted in other subpopulations [23]. We noted that some supplements prepared in pharmaceutical forms of effervescent were used "as refreshment". It is interesting that 25 of the users could not give a specific reason for use of these products, which indicates that the idea of positive attitudes toward these supplements is a main driving factor for VMS use. During the surveys, participants would explain that they have heard that VMS supplements are beneficial and that they used them without any particular reason. This use emphasizes the need and importance for communication between patients and their health professionals or pharmacists on the appropriate use of supplements.

To our knowledge the current survey is one of the few investigations into the vitamin/mineral supplement use and its association with socio-demographic factors in our settings, which is the strength of this study. On the other hand, generalization of the results could be limited due to the size and representativeness of the sample studied.

Conclusion

Monitoring the use of VMS is of interest due to their contribution to the total intake of vitamins and minerals in the population. Physicians need to evaluate the patient's consumption when assessing overall nutrient and medication use. Surveys of this kind are valuable when research is conducted on confounding factors on disease prevention and investigations of the influence of

supplement use on disease outcomes are undertaken. Gaining data on beliefs and attitudes on VMS use are to be used when planning public health activities to increase VMS use among certain populations (such as folic acid supplementation before and during pregnancy and calcium supplements in osteoporosis). However, this is a poorly-investigated topic in R.Macedonia: hence our study is one of the first of this kind.

In this paper we investigated the use of VMS in 256 outpatients in Skopje. Our research showed that nearly half of the surveyed patients used some kind of vitamin and/or mineral food supplements over a period of one month. In particular, being a female and of Macedonian ethnicity, with a higher educational level and having one's own income were predictors for use of these products. Other predictors for VMS use were the presence of a chronic disease, non-smoking and non-consumption of alcohol. VMS supplements were most commonly used to maintain good health.

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Резиме

**СОЦИОДЕМОГРАФСКИ ПРЕДИКТОРИ И ПРИЧИНИ
ЗА УПОТРЕБАТА НА ДОДАТОЦИТЕ НА ХРАНА КОИ СОДРЖАТ
ВИТАМИНИ И/ИЛИ МИНЕРАЛИ КАЈ ГРУПА АМБУЛАНТСКИ
ПАЦИЕНТИ ОД СКОПЈЕ**

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Апстракт: *Вовед:* Додатоците на храна кои содржат витамини и/или минерали (ВМД) претставуваат моно или мулти компонентни производи, подготвени во одредени фармацевтски форми и категоризирани како додатоци на храна.

Повеќе истражувачи ги проучувале предикторите на употребата на ВМД во популацијата. Податоците во нашата средина се скудни.

Цели: Цел на ова истражување беше да се одреди преваленцата, одредени социодемографски предиктори како и причините за употреба на витамини и минерали како додатоци на храната во група од 256 амбулантски пациенти во Скопје.

Материјали и методи: Студијата е дизајнирана како отворена студија на пресек (cross-sectional study). За собирање на податоците за употребата на ВМД користен е методот на анкета. Инструмент на истражувањето претставуваше специјално дизајниран анкетен прашалник. За обработка на податоците беа употребени соодветни статистички тестови.

Резултати: Анализирани беа податоците за употреба на ВМД од 256 амбулантски пациенти од Скопје. Вкупно 105 (41,02%) од испитаниците се изјаснија како корисници на ВМД. Испитаниците од женски пол ($p < 0,01$), оние од македонска етничка припадност ($p < 0,01$), со повисок степен на образование ($p < 0,01$) и со сопствени примања ($p < 0,05$) значајно почесто ги применуваа овие производи. Утврдивме постоење на статистички значителна разлика меѓу групата корисници и некорисници на ВМД во однос на статусот на пушење цигари ($p < 0,05$), консумирањето на алкохолни пијалаци ($p < 0,05$) и присуството на хронично заболување ($p < 0,01$). Најчести извори на информации за овие производи беа докторот, списанијата и пријателите, додека најчеста причина за нивна употреба беше

одржување на здравјето и превенција од заболувања. Само 63% од корисниците ги информирале своите доктори дека применуваат ВМД.

Заклучок: Со ова истражување добивме податоци за примената на ВМД во нашата средина. Познавањето на предикторите на употребата на ВМД е значително поради контрибуцијата на овие производи врз вкупното внесување на витамини и минерали во исхраната и како извор на информации при планирање на јавно-здравствените активности.

Клучни зборови: социодемографски предиктори, витамини, минерали, додатоци на храна.

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