

The Use of Dietary Supplement Among Soldiers From the Macedonian Special Operations Regiment

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ABSTRACT

Objectives: To determine the prevalence and type of dietary supplement used, reasons for use, and sources of supplement information among Macedonian elite Soldiers. **Methods:** Anonymous self-reported questionnaires containing questions about demographic characteristics and dietary supplementation practices were distributed to 134 Soldiers, of whom 80 were recruited from the Ranger Battalion (R) and 54 from the Special Force Battalion (SF). **Results:** The Soldiers completed and returned 132 questionnaires. Overall, 66.6% of the Soldiers, including 70.3% of SF and 64.1% of R, reported using supplements within the 3 months before the survey. On average, each of these Soldiers used 3.7 ± 2.9 supplements. The most commonly used supplements were multivitamins (50.0%) and vitamin C (47.7%). The most frequently cited reason for using supplements was to improve general health (51.6%). Primary sources of supplement information were friends (42.0%) and books/magazines (40.9%). **Conclusions:** Dietary supplement use was found to be common and widespread among this military subpopulation. Given this, and the fact that the majority of the Soldiers do not receive accurate information about supplements, educational intervention regarding the safety and efficacy of these products is needed if unnecessary or harmful supplementation practices are to be prevented.

Introduction

The popularity and acceptance of dietary supplements are on the rise throughout the world. Several recent studies conducted worldwide reported that the prevalence of supplement use in the general population ranges between 23% and 62%, with multivitamins and individual vitamins and minerals being the most commonly used supplements.¹⁻⁸ Some of the prior studies have also revealed that people decide to use such products for a variety of reasons, of which the most frequently cited are to prevent illness, increase energy, ensure adequate nutrition, improve well-being, lose weight, build muscle,

and enhance athletic performance.⁹⁻¹¹ However, the beneficial effects of supplementation are still not well established. Moreover, it has been shown that certain type of supplements may cause serious health problems.¹²

While supplementation practices among the civilian population have been investigated extensively, little is known about the use of supplements among military populations. In fact, there are some data available from studies conducted mainly with U.S. Army Soldiers,¹³⁻¹⁵ but they may not be applicable to the armed forces from other countries, such as Macedonia. Therefore, the purpose of this study is to determine the prevalence and type of supplement used, reasons for use, and sources of supplement information among the Soldiers from the Macedonian Special Operations Regiment. We decided to study the members of an elite unit because it appears that supplement use is most prevalent among this military subpopulation.¹⁴

Methods

One hundred thirty-four male Soldiers from the Macedonian Special Operations Regiment volunteered to participate in this study, which took place from November 2009 to January 2010. Eighty of them were recruited from the Ranger Battalion (R) and 54 from the Special Force Battalion (SF). All Soldiers were briefed about the purpose and procedure of the study before providing their informed consent to participate. Approval to conduct this study was granted by the Ministry of Defense of the Republic of Macedonia.

For the purpose of the study, an anonymous questionnaire was developed based on previously published studies.¹³⁻¹⁵ Before administering the questionnaire to study participants, it was pilot tested for comprehension on 10 Soldiers who were not included in the subsequent study. The first section of the questionnaire required Soldiers to answer questions concerning demographic characteristics such as age, weight, height, smoking status, and

Army Physical Fitness Test score. The second section (see Appendix 1) asked Soldiers to identify any supplements they have used during the past 3 months from a list of 30 supplements. Those who reported supplement use were instructed to indicate the frequency of use (less than once a week, 1–6 times per week, daily) and main reason for use (performance enhancement, general health, physician directed, increase muscle mass, weight loss, other). In addition, Soldiers were provided space to write down any other supplement used but not listed on the questionnaire. Finally, the Soldiers were asked about their source of information regarding supplements. This question (see Appendix 2) included 10 closed-ended answer choices from which Soldiers could select as many as applied. Statistical analyses were performed using STATISTICA software (version 10.0, StatSoft). Descriptive data were calculated as frequencies. Comparisons between R and SF with respect to differences in selected demographic variables were assessed by *t*-test, whereas the differences in supplement use were assessed by χ^2 analyses, Fisher exact test, and *t*-test. Statistical significance was set at $p < 0.05$.

Results

Of the 134 Soldiers who received questionnaires, 132 completed and returned them. Two questionnaires were discarded because of incomplete data. Table 1 provides the characteristics of the Soldiers who participated. There was no significant difference between the R and SF in relation to age, height, body mass index, smoking status, and Army Physical Fitness Test score. However, SF were heavier than R ($p = 0.03$). Overall, 66.6% of the Soldiers reported using supplements during the past 3 months, of whom more than half (54%) were occasional users. The prevalence of supplement use was higher for SF (70.3%) than for R (64.1%), although this did not reach statistical significance ($p = 0.45$). A total of 25 different supplements were used, with a mean of 3.7 ± 2.9 (range 1–12)

supplements per user. When separating battalions, the average number of supplements per user for R and SF was 3.6 ± 2.8 and 3.9 ± 3.1 , respectively ($p = 0.64$).

Table 2 lists all types of supplements reported by Soldiers. As it could be seen, the most commonly used were multivitamins (50%) and vitamin C (47.7%). No significant difference was found in the use of any of supplements between R and SF. Regarding the reasons for supplement use, the most frequently cited response was to improve general health (51.6%), followed by performance enhancement (28.4%), direction by physicians (9.1%), muscle mass improvement (6.4%), other (3.3%), and weight loss (0.9%). Regarding the sources from which Soldiers obtained information about supplements, the majority reported these to be friends (42.0%) and books/magazines (40.9%), followed by television (29.5%), Internet (27.2%), newspapers (27.2%), physicians (22.7%), family members (12.5%), and coach (12.5%).

Discussion

This study is the first to report the patterns of supplement use among Macedonian elite Soldiers. The characteristics of these Soldiers in terms of age, weight, height, and body mass index are similar to those reported by Bovill et al.¹⁴ for U.S. Special Operation Forces (SOF) Soldiers. Our study reveals that 66.6% of the Soldiers interviewed, including 70.3% of SF and 64.1% of R, reported current supplement use. This high prevalence of supplement use is consistent with that observed in surveys of U.S. Army Ranger and Special Forces Candidates¹³ and U.S. SOF Soldiers¹⁴ (64% and 87%, respectively). Furthermore, the current study shows that the types of supplements used by Macedonian elite Soldiers are similar to those reported by their U.S. peers. In fact, identical to our findings, multivitamins and vitamin C were the two most commonly used supplements among U.S. SOF Candidates.¹³ In the study by Bovill et al.¹⁴ these supplements were also listed as the most popular, along with sports drinks and sports bars.

In this study, the most frequently cited reason for supplement use was to improve general health, which is in line with that reported by Lieberman et al. for U.S. Army Soldiers.¹⁵ A considerable number of Soldiers (28.4%) also reported using supplements to enhance performance. Contrary to these beliefs, according to current scientific evidence, most of the supplements reported by our respondents (i.e. vitamins and minerals) do not aid in health promotion^{16,17} or performance enhancement,¹⁸ unless a person has a particular nutritional deficiency. Because no evaluation of the Soldier's diet was undertaken, it is not known whether some of these Soldiers experienced suboptimal micronutrient intake and thus warranted supplementation. This also applies for protein

Table 1 Characteristics of Soldiers

	All (n = 132)	R (n = 78)	SF (n = 54)	<i>p</i> Value
Age (years)	28 ± 3.4	27.2 ± 3.4	29.2 ± 3.1	0.55
Height (cm)	178.4 ± 5.9	177.6 ± 5.9	179.5 ± 5.8	0.07
Weight (kg)	81.3 ± 9.1	79.7 ± 7.9	83.4 ± 10.2	0.03
Body mass index (kg/m ²)	25.5 ± 2.2	25.2 ± 2.1	25.8 ± 2.4	0.71
Army Physical Fitness Test score	279.5 ± 15.7	280.9 ± 15.7	277.4 ± 15.6	0.67
Smoke	50 (37.8)	25 (32.0)	25 (46.2)	0.09

Note: Data are expressed as mean ± SD or number (percentage)

Table 2 *Types of Dietary Supplements Used by Soldiers*

Supplement	All (N = 132)	R (n = 78)	SF (n = 54)	p Value
Multivitamins	66 (50.0)	37 (47.4)	29 (53.7)	0.80
Vitamin C	63 (47.7)	34 (43.5)	29 (53.7)	0.39
B complex	24 (18.1)	11 (14.1)	13 (24.0)	0.20
Calcium	20 (15.1)	14 (17.9)	6 (11.1)	0.18
Sports drinks	20 (15.1)	12 (15.3)	8 (14.8)	0.74
Vitamin B6	18 (13.6)	11 (14.1)	7 (12.9)	0.68
Magnesium	17 (12.8)	8 (10.2)	9 (16.1)	0.37
Vitamin A	17 (12.8)	10 (12.8)	7 (12.9)	0.85
Vitamin E	15 (11.3)	7 (8.9)	8 (14.8)	0.38
Iron	13 (9.8)	6 (7.6)	7 (12.9)	0.40
Protein powder	12 (9.0)	6 (7.6)	6 (7.4)	0.61
Vitamin B12	10 (7.5)	5 (6.4)	5 (9.2)	0.64
Amino acids	8 (6.0)	4 (5.1)	4 (7.4)	0.68
Selenium	4 (3.0)	2 (2.5)	2 (3.7)	0.78
Chromium	3 (2.2)	2 (2.5)	1 (1.8)	0.73
Zinc	3 (2.2)	2 (2.5)	1 (1.8)	0.73
Glutamine	3 (2.2)	1 (1.2)	2 (3.7)	0.40
Creatine	3 (2.2)	2 (2.5)	1 (1.8)	0.73
Antioxidants	2 (1.5)	2 (2.5)	0 (0.0)	0.21
Branched-chain amino acids	2 (1.5)	0 (0.0)	2 (3.7)	0.10
Coenzyme Q10	1 (0.7)	0 (0.0)	1 (1.8)	0.25
Ginseng	1 (0.7)	0 (0.0)	1 (1.8)	0.25
Tribulus	1 (0.7)	1 (1.2)	0 (0.0)	0.38
Weight gainers	1 (0.7)	0 (0.0)	1 (1.8)	0.25
Carnitine	1 (0.7)	0 (0.0)	1 (1.8)	0.25

Note: Data are expressed as number (percentage).

and amino acid supplements. Sports drinks, on the other hand, may be of great value for Soldiers when consumed during prolonged exercises, as the nutrients these products provide could delay the onset of fatigue and improve both cognitive¹⁹ and physical²⁰ performance. When speaking about supplements, it should be mentioned that even creatine, a supplement with well-documented ergogenic properties, has been shown to be ineffective as a performance enhancer when it comes to specific military exercises.^{21,22}

Consistent with the findings of other studies,^{9–11} a majority of supplement users in our study obtained information about supplements from unreliable sources. The primary sources were friends and magazines/books. Unfortunately, physicians were less frequently cited. This finding is in contrast to recommendations of the U.S. Food and Drug Administration that individuals should

consult a healthcare professional before consuming any supplement.²³

A key positive finding of this study is that none of the Soldiers had reported use of potentially dangerous supplements such as weight loss products, ephedrine-containing supplements, or prohormones. Although the types of supplements used by the respondents are generally considered to be safe, adverse effects may occur from excessive supplementation. For example, the overconsumption of certain vitamins and minerals from supplements can be toxic,^{16,24} and too much protein or amino acid intake from either food or supplements may lead to side effects such as gout, kidney overload, dehydration, urinary excretion of calcium, and loss of bone mass.²⁵ There are also a few case reports describing compromised renal function associated with creatine consumption.^{26–28} Considering the above, it is important

that Soldiers are made aware that the misuse of supplements carries potential health risk.²⁹

The current study is not without limitations. Because all of the data were self-reported, a possibility exists that the Soldiers may have misreported some data. Also, the survey was performed in a single unit, and therefore the sample may not be representative of all Macedonian Soldiers. In conclusion, our study shows supplement use to be common and widespread among this military subpopulation. Given this, and the fact that majority of the Soldiers do not receive accurate information about supplements, educational intervention regarding the safety and efficacy of these products is needed if unnecessary or harmful supplementation practices are to be prevented.

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Appendix 1

Supplement	Frequency of Use					Reason for Use					
	Never	In the past but not now	Occasional (< once per week)	Frequent (1–6 times per week)	Daily	Performance enhancement	General health	Physician directed	Increase muscle mass	Weight loss	Other
Multivitamins											
Antioxidants											
Vitamin A											
Vitamin C											
Vitamin E											
B complex											
Vitamin B6											
Vitamin B12											
Calcium											
Magnesium											
Iron											
Chromium											
Selenium											
Zinc											
Dehydroepiandrosterone											
Androstenedione											
Caffeine pills											
Ephedra/Ma huang											
Coenzyme Q10											
Ginseng											
Tribulus											
Weight gainers											
Sport drinks											
Weight loss products											
Creatine											
Protein powder											
Amino acids											
Glutamine											
Branched-chain amino acids											
Carnitine											

Appendix 2

Sources of Supplement Information (select as many as applied)			
Scientific journals		Physician	
Books/magazines		Family members	
Newspapers		Friends	
Television		Coach	
Internet		Other	

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