

Prevalence of Intake of Dietary Supplements in the Population of Saudi Arabia– Jeddah

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ABSTRACT

Background: Several studies have shown micro-nutrient deficiencies in the Middle East region. Prominent defects in vitamin D, folate, and iron were especially noted. There are not many studies currently that tell us about the prevalence of dietary supplement intake in Saudi Arabia.

Aim: The aim was to observe the current prevalence of dietary supplement use in Saudi Arabia. We will also attempt to elicit the reason they take the supplements, and how it affects their overall quality of life.

Method: Cross-sectional study among 489 Saudi patients was without any exclusion criteria using a standard questionnaire. The study was held at the endocrinology department of King Abdul Aziz Hospital & Oncology Center in Jeddah, Saudi Arabia.

Results: The overall prevalence of multivitamin, mineral and supplement intake in the Saudi population was found to be 22%. Among them 16% were male and 24% were female.

Conclusion: Healthcare providers must spread more awareness about the potential benefits of dietary supplements in preventing non-communicable diseases.

Keywords: multivitamin and mineral intake; dietary supplements; food fortification; Saudi Arabia public health awareness.

INTRODUCTION

The US Food and Nutrition Board of the Institute of Medicine (IOM) defines Dietary Reference Intakes (DRI) for 29 vitamins and minerals (**table 1**)^[1]. Experts recommend obtaining the essential micronutrients by eating a varied and balanced diet^[2]. Nevertheless, persistent or periodic nutritional gaps are not uncommon in the general population^[3], and people who don't consume adequate amounts of certain foods may fall short on nutrients. Throughout the life cycle there are times when the body requires more nutrients than the typical diet may provide, for instance iron during pregnancy and vitamin B12 after the age of 50 years^[4]. Deficiencies in one or more nutrients may sometimes contribute to serious health issues^[5].

Diet supplementation is relatively common in the United States. It was noted by the National Health and Nutrition Examination Survey (NHANES) that approximately half of the people living in the United States take some form of dietary supplements, the most common being multivitamin and mineral^[6].

The US National Institutes of Health defines multivitamins and minerals as supplements that consist of at least 3 or more micronutrients at doses less than Tolerable Upper Level determined by the

Food and Nutrition Board of the IOM, and they must be free of herbs, hormones, or drugs^[7]. Using this definition, products with widely varying compositions are classified as multivitamin and mineral supplements. Food fortification, as defined by the World Health Organization, is "a process of deliberately increasing the content of an essential micronutrient in a food irrespective of whether the nutrients were originally in the food before processing or not, so as to improve the nutritional quality of the food supply and to provide a public health benefit with minimal risk to health"^[26].

Dietary supplements are capable of providing large amounts of micro-nutrients to the diet. Multiethnic Cohort Study showed that dietary supplement users consumed higher amount of thiamin, riboflavin, niacin, vitamins A, B-6, B-12, E, and folate from the supplements alone^[8]. Evidence has also suggested that eating patterns that include high intakes of vegetables, fruits, nuts, and whole grains are linked to a significantly lower risk of cancer, heart disease, and stroke^[9, 10]. Therefore, use of dietary supplements can be a preventive measure to lower the prevalence of many non-communicable diseases and micronutrient deficiency^[11]. However,

excess intake of these supplements may also have the potential to increase the risk of toxicity^[12].

Several studies were done in the Middle East region that point to a very high prevalence rate of vitamin D deficiency, reaching as high as 50% among the females of child-bearing age^[13]. A survey done by *Alquaiz et al.* in Saudi Arabia among 203 males and 192 females aged 13–18 years showed that 16.7% of males and 34.2% of females had anemia with Hb < 12 g/dL^[14]. This study showed significant associations between female gender and anemia. Another study depicted the incidence of neural tube defects in Saudi Arabia to be 1.05-1.90/1000 live births indicating the lack of dietary folate among the pregnant women^[15]. The prevalence of vitamin A deficiency was reported to be roughly 10% in the Kingdom^[16].

Inadequate vitamin and mineral intake has been linked to factors such as low socio-economic status, less access to healthy food, eating disorders, unqualified weight-loss programs, emotional and physiological stresses, lack of awareness, and unhealthy practices such as smoking^[17].

In this study, we will find the prevalence of multivitamin and dietary supplement intake among the healthy population in Saudi Arabia, as not many studies were done about this topic. We will also attempt to find the reasons behind their intake, and how they feel it has affected their overall quality of life.

METHODOLOGY

Study Setting: The study was conducted at the endocrinology department of King Abdul Aziz Hospital & Oncology Center in Jeddah, Saudi Arabia.

Study Design: It is a cross-sectional study among 489 Saudi volunteers in the age range of 18-65 years, using a questionnaire. No exclusion criteria were used in the study.

Variables: The dependent variables in this study were:

Patients' gender and age

- Intake of supplement (yes/ no)
- How often (regular/ irregular)
- Type of supplement (multivitamin and mineral pill/ specific vitamin/ fortified dietary substance)
- The reason for supplement intake (prescribed with other medications/ beauty blogs/ increased health awareness/ gymnasium)
- Who recommended it? (Health care worker/ online media/ fitness trainer/ friends and family/ other)

- Changes perceived in quality of life (Better/ same as before/ worse/ not sure)

Data Collection: Data collection was done from December 2016 till February 2017 from those attending the Department of Endocrinology. Consent for study was obtained from all participants, and they were given a brief description.

The study was approved by the Ethics Board of NAJRAN University.

Data Analysis: Statistical analyses were performed to detect association between different independent variables using SPSS.

RESULTS

After having the 489 volunteers to fill in the questionnaire, it was found that 381 (77.91%) did not consume any form of supplements, while 108 (22.08%) did (**Fig1**).

(**Table 2**) Shows the analysis based on gender. Out of 158 male participants, 26 (16.46%) said they take supplements, while 132 (83.54%) said they do not. From the 331 female participants, 82 (24.77%) responded that they did take supplements, while 249 (75.23%) said they do not. Furthermore, we divided the people who take supplements into age groups of 18- 35, 36-50, and 51- 65 (**Table3**). For males, 13 (50%) are of age group 18-35, 6 (23.01%) are 36-50 years old, and 7 (26.92%) are 51-65 years old. Among females, 21 (25.61%) fall in age range 18-35, 23 (28.04%) are of age 36-50 years, and 38 (46.34%) are of age 51-65 years old.

Upon asking those who take supplements if they did so regularly, 47 (43.52%) said they took them on a regular basis, while 61 (56.48%) said they do not take them regularly, as demonstrated in (**Fig2**).

(**Fig3**) shows the types of supplements that were being taken. 19 (17.59%) said they take multivitamin and mineral pills, 44 (40.74%) said they were taking a specific vitamin or a mineral (ex. only folate or vitamin C), 34 (31.48%) said that they take dietary supplements in the form of fortified food (ex. fortified cereal or milk, protein shakes etc.), and lastly 11 (10.19%) said they took a combination of the above.

(**Fig 4**) demonstrates the reasons for supplement intake. The primary reason for 37 (34.25%) was because they were prescribed to take them by a health care provider. 40 (37.04%) said they had learnt about the beauty benefits of taking the supplements on the net and media. 14 (12.96%) are taking them because of increased health awareness and to improve their overall health. 13 (12.03%)

took the supplements for fitness and learned about them in the gym. 4 (3.70%) started taking the supplement because their friends or family recommended it after they had experienced benefits.

Lastly, (Fig 5) breaks down the responses about the overall change perceived in the quality of life. 63 (58.33%) reported they felt an improvement in life

quality after taking supplements. 11 (10.19%) said they had not noticed any significant difference. 32 (29.63%) said they were not sure because they were also making other lifestyle changes along with taking the supplements, for instance eating healthy and exercising. Only 2 (1.85%) reported their general overall quality of life had deteriorated.

Table 1
Dietary Reference Intakes: Tolerable Upper Intake Levels

	Age 9-13 y	Age 14-18 y
Vitamin A (ug/d)	1700	2800
Vitamin c (mg/d)	1200	1800
Vitamin k (mg/d)	ND	ND
Thiamin (mg/d)	ND	ND
Riboflavin (mg/d)	ND	ND
Niacin (mg/d)	20	30
Vitamin B6 (mg/d)	60	80
Folate (ug/d)	600	800
Vitmain B12 (ug/d)	ND	ND
Vitamin E (mg/d)	600	800

ND: Not Determines

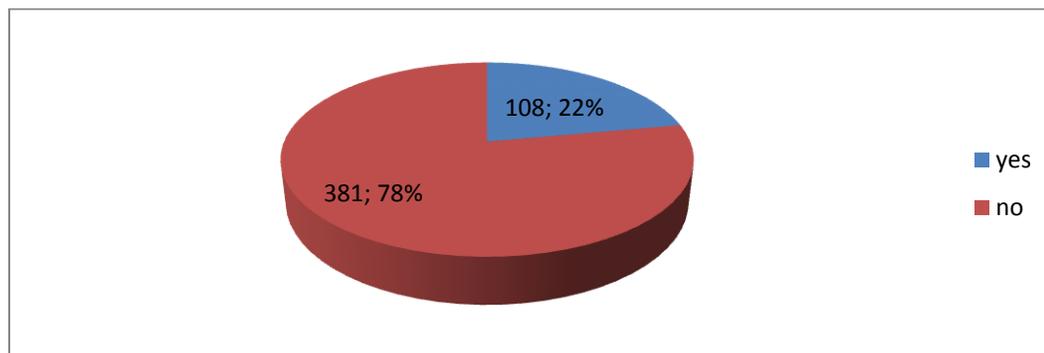


Figure 1: Number of people who take dietary supplements

Table 2: Distribution of Supplement Intake Based on Gender

Males (158)		Females (331)	
Take supplement	Do not take supplement	Take supplement	Do not take supplement
26 (16.46%)	132 (83.54%)	82 (24.77%)	249 (75.23%)

Table 3: Supplement Intake with Respect to Age Groups and Gender

Age (in years)	18- 35	36- 50	51-65
Males	13 (50%)	6 (23.01%)	(26.92%)
Females	21 (25.61%)	23 (28.04%)	38 (46.34%)

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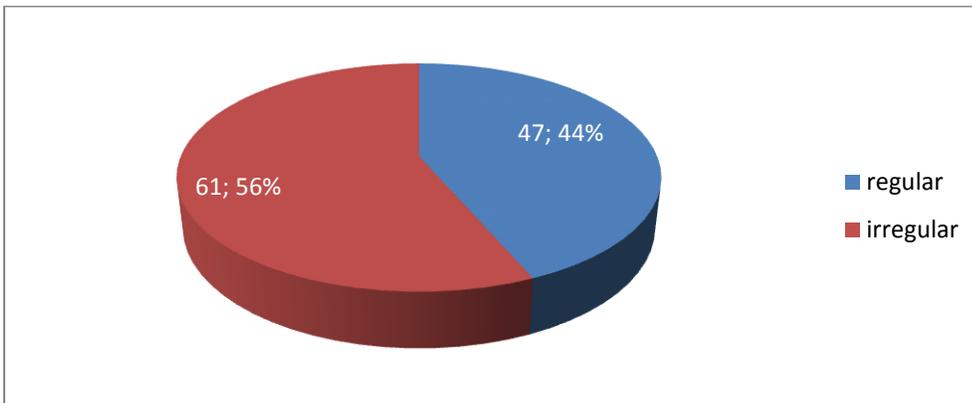


Figure 2: The pattern of Supplement Intake

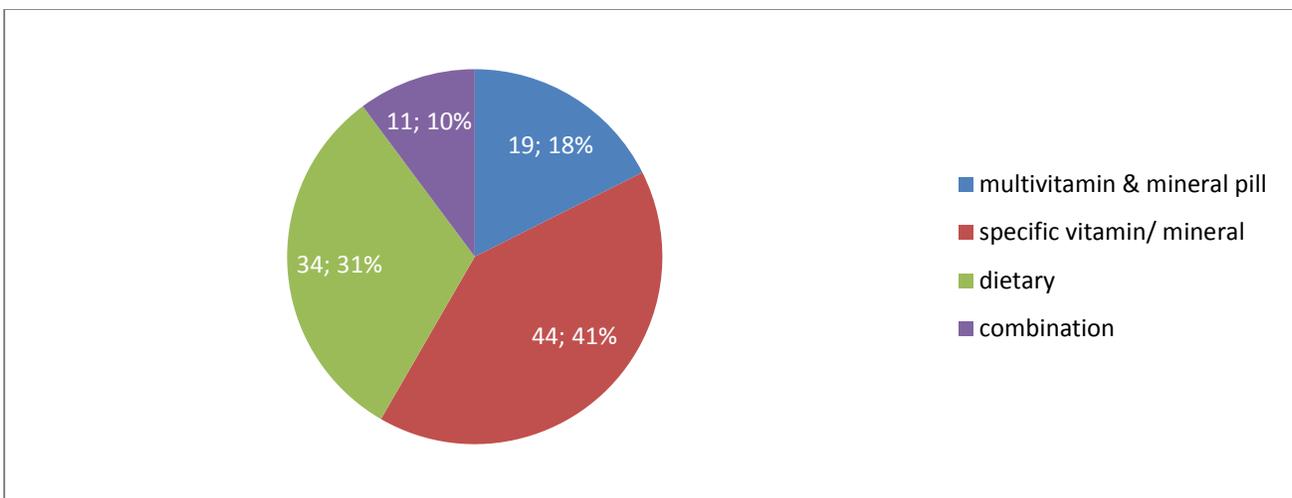


Figure 3: The Type of Supplement Taken

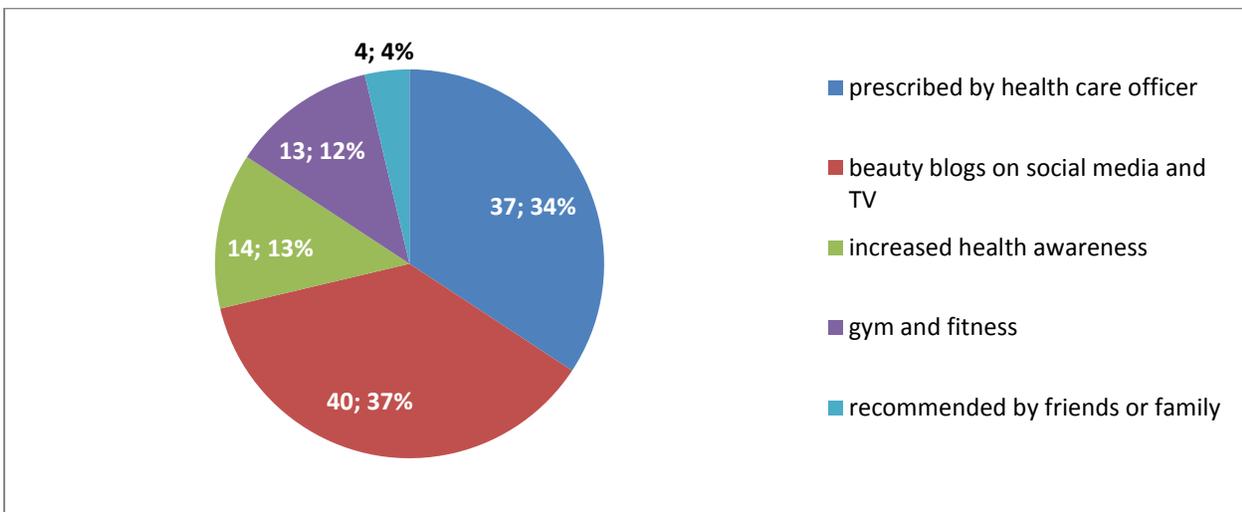


Figure 4: Reason for Supplement Intake

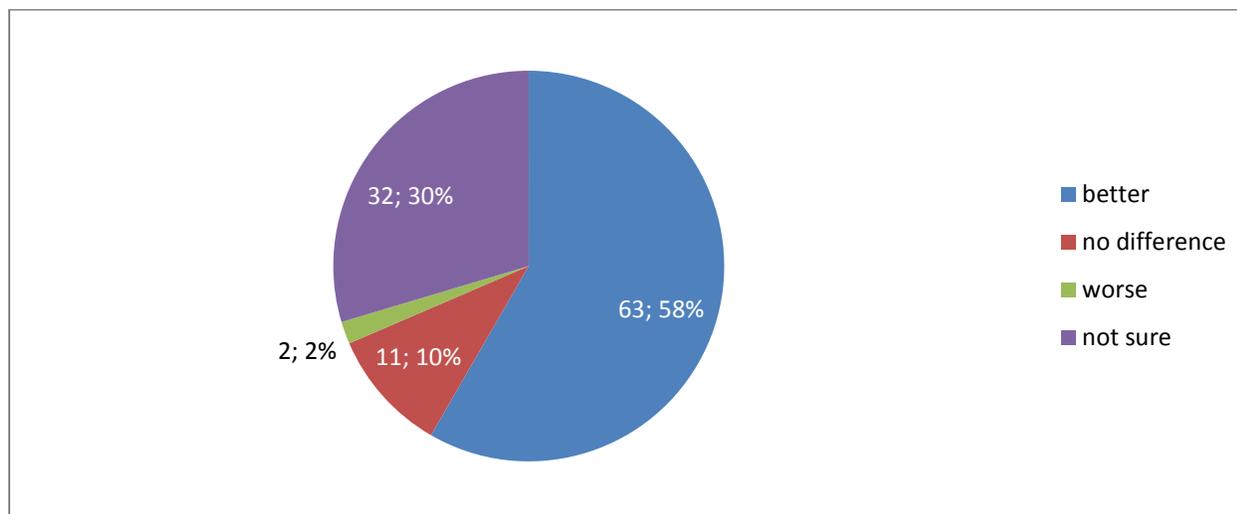


Figure 5: Outcome on Quality of Life as Perceived by the Subject

DISCUSSION

As we had mentioned earlier, several studies done in the Middle-east showed the prevalence of various vitamin and mineral deficiencies; especially vitamin D, iron, and folic acid. Therefore, it is worth paying attention to this issue, especially since the solution is very simple. Additionally, Saudi Arabia has a high prevalence of overweight and obesity (74%–86% in women and 69%–77% in men), which is also considered a form of malnutrition^[18].

Some of the benefits of vitamin and mineral supplementation are mentioned. For instance, vitamin D supplementation has been shown to increase the density of minerals in bones and reduce turnover. If vitamin D and calcium are taken together, they have shown decreased bone loss and fracture rates^[19]. Study done by McNulty *et al.* concluded that increasing the amount of vitamins B6, B12, and folic acid effectively decreases the total plasma homocysteine by 3 mmol/L. They also demonstrated a reduction in risk of CVD by 11%–16%, and of stroke by 19%–24%^[20], while giving folic acid supplementation alone reduced the overall risk of stroke by 18%^[21]. Supplementation has shown to have no effect on cancer or vascular mortality, but they showed a slight decrease in all-cause mortality^[22].

Micronutrients are very inexpensive. Low cost supplements and fortifiers are easily available via an array of commercial channels^[23]. National fortification programs must easily be able to target common food items consumed and add nutritional

value in effective doses for the general population^[24].

CONCLUSION

The overall prevalence of multivitamin and mineral and supplement intake in the Saudi population was found to be 22%; among them 16% were males, and 24% were female. It is relatively a smaller number compared to many other countries like the United States where the prevalence of multivitamin intake is more than 50%^[25]. Since multivitamin intake has been shown to prevent or reduce risk of many non-communicable diseases, such as malnutrition, anemia, neural tube defect, stroke, and cardiovascular diseases, it is important that people should be made more aware of it during medical consultations, health-awareness programs, mass media, and food fortification programs.

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