

## **Gender Differentials in Level of Use of Vitamin Supplements among Non-Academic Staff of Tertiary Institutions in Benue State**

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### **Abstract**

This study investigated the level of use of vitamin supplements among the non-academic staff of tertiary institutions in Benue State. A cross-sectional descriptive survey research design was adopted for the study. The population for the study comprised all non-academic staff of tertiary institutions in Benue State. A multi-stage sampling procedure was used to select 300 non-academic staff from a population of 3,956 staff. The instrument for data collection was a self-developed Vitamin Supplement Use Questionnaire (VSUQ) which was validated by three experts, with a reliability index of 0.92. Mean and standard deviation were used to answer the research questions, while independent t-test was used to test hypothesis at .05 level of significance. The results indicated higher level use of vitamin supplements among females than their male counterparts (females  $M = 2.22 \pm 0.84$  > males  $M = 2.11 \pm 0.87$ ). Further statistics revealed that there was no statistically significant gender difference in the level of use of vitamin supplements ( $p > .05$ ). The authors recommended that health committees in the tertiary institutions in Benue State to embark on enlightenment programmes for the safe use of vitamin supplements on the part of the staff so as to enhance their health status.

**Keywords:** Vitamins, Vitamin supplements, Non-academic staff, Tertiary institutions

### **Introduction**

The need for enhanced nutritional status through the fortification of available foods with necessary vitamin supplements cannot be overemphasized. Vitamins are a group of substances that are needed for normal cell function, growth, and development. Yvette (2020) sees vitamins as organic compounds that people need in small quantities. Most vitamins come from food because the body either does not produce them or produces very little. Vilaplana et al. (2017) opines that vitamins are a wide group of organic compounds that are required for normal body function. Deficiencies of micro-nutrients are a major global health problem. WHO (2023) estimated that more than 2 billion people worldwide are deficient in key Vitamins and mineral; it is reported that most of these people live-in low-income countries and are typically deficient in more than one micro-nutrient (Kay, 2020; Zhang et al., 2020). Around the world, cereals are staple foods and good sources of vitamins A, B and E (Garg et al., 2021). According to the authors, cereals are in-expensive and are consumed in large quantities, attempts are being made to enrich cereals using fortification and bio-fortification in order to address vitamin deficiency disorders in a vulnerable population. The dietary intake of vitamins is crucial because, except for vitamins D and B<sub>1</sub>, the human body cannot synthesize them. Vitamin deficiency can lead to various disorders. However, as vitamins are present in staple foods, the consumption of vitamin containing foods can alleviate such disorders (Combs & McClung, 2016).

Values have been calculated from dietary reference intake recommendations for male healthy adults (19+ years) according to the United States Food and Drug Administration (FDA, 2023). Foods rich in provitamin A carotenoids include orange-coloured fruits (papaya and mango) and vegetables (carrot and sweet potato), vitamin B, C, and K are found in kiwis and bananas and in vegetables such as spinach, kale, broccoli, mushrooms and peppers, while foods such as nuts (almonds and peanuts) and cereal germ (wheat and brown rice) provide rich sources of vitamin E (McPherson, 2017). Deficiencies in vitamins are however corrected by vitamin supplementation.

Vitamin supplements are organic micronutrients that the body requires in small quantities to function correctly. They play a fundamental role in cell growth, development and activity. Vitamin supplements are products intended to add nutritional value to diets, boost the immune system and general growth and development. Vitamin supplements or dietary supplements are a combination of nutritional, herbal and hormonal supplements consumed to complement deficiencies in regular diet and to treat and prevent diseases (Kay, 2020). Health benefits of vitamin supplements are to correct micronutrients deficiency or maintain an adequate intake (Zhang et al., 2020). According to Brandon (2023), multivitamins and mineral supplements make up 40% of all the vitamin sales on the market; and contain fish oil, omega 3, Decosahexaenoic acid (DHA) or Eicosapentaenoic acid (EPA) and fatty acids. Common mineral supplements are in the form of multivitamins and include; Vitamin B12 which help to keep the nerves and blood cell healthy, make Deoxyribonucleic Acid (DNA) and prevent anaemia; Folic acid reduces birth defects when taken by pregnant women; vitamin D strengthen bones when combined with calcium thus promote bone health. Vitamins C and E prevents cell damage while vitamin A slows vision loss from age related macular degeneration. United Nations Children's Fund (UNICEF, 2019) states that, a deficiency in vitamins has been implicated to be the leading cause of blindness and high risk of death from common illnesses such as diarrhea in children and thus has been classified by the World Health Organization (WHO, 2019) as a public health problem affecting children in South Asia and Sub-Saharan Africa. Peters (2022) opines that the deficiency of vitamins can cause a range of symptoms such as fatigue, irritability and changes to the skin and hair. The specific symptoms depend on which vitamin(s) are at low levels, as each one plays a different role in the body.

Vanburen and Everts (2022), lists some of the symptoms of vitamin deficiency to include: Fatigue and weakness, dry skin and hair, depression, easy bruising or bleeding, poor wound healing, drawbacks of vitamin E, predisposition to infections, bone fractures and, skin colour changes among others.

The effect of vitamin supplements on the risk of non-communicable diseases in generally healthy populations is controversial. O'Connor (2022) noted that vitamin and mineral supplementation was associated with little or no benefit in preventing cancer, cardiovascular diseases and death with the exception of a small benefit for cancer incidence with multivitamin use. However, Kay (2020) pointed out that medical conditions like fibroid, dementia and insomnia have been improved with vitamin supplements use.

The recommended daily allowance (RDA) for vitamin K can be easily met by consuming vegetables (e.g. spinach, kale and broccoli). The RDA for vitamin D is difficult to meet from food sources alone; however, sunlight is a good source (Choi et al., 2018). In healthy adults, deficiencies in vitamins B<sub>5</sub>, B<sub>6</sub>, B<sub>7</sub>, C, and K are uncommon. However, in the vulnerable population (e.g. the elderly, infants, children and pregnant/lactating women) the RDA for vitamins A, B<sub>2</sub>, B<sub>3</sub>, B<sub>6</sub>, B<sub>9</sub>, B<sub>12</sub>, C, D, E and K increases deficiency diseases (Thakur, et al., 2020). According to the National Library of Medicine (NLM) (2022), vitamins are grouped into two categories: Fat-soluble vitamins which are stored in the liver, fatty tissue, and muscles. The four fat-soluble vitamins according to the NLM are vitamins A,

D, E and K. These vitamins are absorbed more easily. The second group as stated by the NLM is water-soluble vitamins which are not stored in the body. The nine water-soluble vitamins are vitamins C and all the B vitamins. These are essential for health and must be consumed or supplemented for health.

Disease of the liver reduce the absorption of vitamins A, D, E, and K from the intestine, likewise ileac diseases reduces vitamin B<sub>12</sub> absorption, while renal diseases reduce vitamin D absorption (McPherson, 2017). Though the human body needs vitamins, they appear not synthesizes within the body. At least not in sufficient amounts to meet our daily needs and therefore must be obtained from the diet (Kumanyika & Oria, 2017).

In Nigeria, food supplement use is prevalent as people take it for diverse reasons. Aina and Ojedokun (2014) reported that the reasons for vitamin supplements use range from making up for nutritional gaps in the foods eaten to health benefits. Some of the health benefits include increased mental performance, improved immunity, weight loss especially among the female population, and even total healing from diseases such as erectile dysfunction, cerebral stroke, diabetes mellitus (DM), hypertension, arthritis, coronary heart disease (CHD) and cancer. Other reasons ranged from good health, poor diet, to boost immunity, for weight gain and doctor's prescription. Most of the students were occasional and once in a while user. For many, the use of supplements represents an effort to take charge of and be instrumental in their healthcare. food supplements are consumed to promote general health, improve energy or memory and to treat or prevent medical conditions such as arthritis, erectile dysfunction, obesity, diabetes mellitus, hypertension, cerebral stroke, cancer and coronary heart disease (Aina & Ojedokun, 2014). Food supplements use in the prevention and treatment of diseases has risen globally owing to aggressive advertisement on the part of manufacturers, coupled with increased ease of access to, and the relatively low cost of substances in question (Berginc & Kreft, 2014).

The usage of food supplements in general has been associated with demographic characteristics of gender. Salmean and Alhuwail (2018) reported vitamin supplement use higher in females (76%) than males (74%). Velicer and Ulrich (2018) reported that, among breast and prostate cancer survivors, females reported higher use of vitamins supplements than males. Austin, Price, McGraw and Lieberman (2018) reported that the use of individual vitamins or minerals was significantly greater in males than in females ( $p < 0.01$ ). Prevalence of protein and amino acid use was higher in males ( $p < 0.01$ ). Use of combination products was significantly greater in males than females ( $p < 0.01$ ) The most commonly reported reasons for using supplements are to improve or maintain overall health. Women use calcium products for bone health or for improving healthy skin appearance, whereas men are more likely to report supplement use for heart health or to lower cholesterol (Arthur, 2015). Morton et al. (2018) reported the use of vitamins supplements among postmenopausal women who were receiving therapy for low bone mineral density (BMD). Daily vitamin supplement intake ranged from 100 to 5000 mg; the mean daily dose was 745 mg (high). Average duration of use was 12.4 years; 85% had taken vitamin supplements for more than 3 years. The study concluded that Vitamin supplement use appears to have a beneficial effect on levels of BMD, especially among postmenopausal women using concurrent estrogen therapy and calcium supplements. This may be an indication that vitamin supplement use may differ among non-academic staff based on gender.

Benue State also has a fair share of food supplement use as most of its population both males and females including pregnant women ingest food supplements for one reason or another. Okon et al. (2020) reported that pregnant women were aware of folic acid as a supplement in a study on awareness and use of folic acid among women of childbearing age in Benue State.

Non-academic staff are those who work in the universities in Benue State and perform duties other than lecturing or teaching. Some may be highly educated while others may not leading to poor retrieval of information skills, lack of resources in the library and may be easily convinced into supplements use. It was deemed necessary to study their use of food supplements especially as most information about the supplements are obtained from print materials.

The researchers have been around and are conversant with the Benue environment especially as it relates to tertiary institutions, and are disturbed by the craving for vitamin supplements by a cross section of the population especially on campuses. Based on observation, the reasons for this patronage appear to include hope for cure of diseases, performance enhancement, weight loss, energy boost and other personal reasons. It seems that both men and women in these institutions use vitamin supplements, the researchers are interested in gender differences in the level of use of vitamins supplements among the non-academic staff of tertiary institutions in Benue State. Specifically, the study assessed the level of vitamin supplement use among non-academic staff of tertiary institutions in Benue State, assessed the level of vitamin supplement use among the staff based on gender and to test if there are significant gender differences in the level of use of vitamin supplements among the non-academic staff. The findings of the study will be of benefit to the general public, educators, food supplement users of both gender, and researchers.

### **Methods and Materials**

A cross-sectional descriptive survey research design was adopted for the study which according to Emaikwu (2013) and Atovigba (2019) is one in which a group of people or items are studied by collecting and analyzing data from a few people considered to be a representative sample of the entire population. The population for the study comprised all non-academic staff of tertiary institutions in Benue State. A multi-stage sampling procedure was used to select 300 non-academic staff from a population of 3956 staff (Registrars' office, 2023). The instrument for data collection was researchers designed questionnaire titled 'Vitamin Supplement Use Questionnaire (VSUQ) which was validated by 3 experts in the Department of Human Kinetics and Health Education, Benue State University Makurdi. The reliability of the instrument was ascertained through split half method using Product Moment Correlation co-efficient and yielded a reliability coefficient index of 0.92 indicating a substantial reliability and was used for data collection. Data was collected from the respondents in their offices across the institutions. Respondents filled and returned the completed questionnaire on the spot to avoid loss. Data were analyzed using mean to answer research questions. Mean scores between 3.5 – 4 were interpreted as high usage, 2.5 – 3.49 were interpreted as moderate use; while mean scores of between 1.5 – 2.49 were interpreted as low use; and scores between 1.0 – 1.49 were interpreted as very low use. The hypothesis was tested using t-Test statistic at .05 level of significance.

## Results

**Table 1**  
**Level of Vitamin Supplement Use among Non-Academic Staff of Tertiary Institutions in Benue State (n = 286)**

S/N	Item	Mean	SD	Remark
	<i>Vitamin Supplement use</i>			
1	How often do you use Reloaded (multivitamins & antioxidants)?	2.14	0.92	Low
2	How often do you use B complex (B <sub>1</sub> , B <sub>2</sub> , B <sub>3</sub> , B <sub>5</sub> , B <sub>6</sub> , B <sub>4</sub> , B <sub>9</sub> , B <sub>12</sub> )?	2.40	0.82	Low
3	How often do you use Cellgevity (Vitamin C, Selenium, Riboceine)?	2.11	0.89	Low
4	How often do you use Tre-en (vitamin E)?	2.07	0.86	Low
5	How often do you use Pro-vitality (vitamin C, B <sub>1</sub> , B <sub>2</sub> and B <sub>3</sub> )?	1.99	0.82	Low
	Cluster	2.14	0.86	Low

Results in Table 1 shows a cluster mean of 2.14 (SD = 0.86) on level of use of vitamin supplements indicating low use among non-academic staff of tertiary institutions in Benue State. The Table further indicates low use of these vitamin supplements: Reloaded ( $\bar{x}$  = 2.14, SD = 0.92); Vitamin B complex ( $\bar{x}$  = 2.40, SD = 0.82); Cellgevity ( $\bar{x}$  = 2.11, SD = 0.89); Tre-en ( $\bar{x}$  = 2.07, SD = 0.86) and Pro-vitality ( $\bar{x}$  = 1.99, SD = 0.82).

**Table 2**  
**Level of Vitamin Supplement Use among Non-Academic Staff of Tertiary Institutions in Benue State based on Gender**

Food Supplements	Male (n = 210)		Female (n = 76)	
	M	SD	M	SD
Vitamin Supplements	2.11	0.87	2.22	0.84

M= mean; SD= Standard Deviation

Table 2 shows that female participants had higher mean scores than their male counterparts on the level of use of vitamin supplements: vitamins (females M = 2.22 ± 0.84 > males M = 2.11 ± 0.87)

**Table 3**  
**Result of t-Test Analysis Verifying Level of Vitamin Supplements Use among Non-Academic Staff of Tertiary Institutions in Benue State based on Gender**

Food Supplements	Male (n = 210)		Female (n = 76)		t (284)	p-value	Decision
	M	SD	M	SD			
Vitamin Supplements	2.11	0.87	2.22	0.84	-0.92	.373	Significant

\* $p < .05$ ; M= mean; SD= Standard Deviation

Table 3 indicates that the non-academic staff of tertiary institutions who were males ( $n = 210$ ) had a higher mean score ( $M = 2.11$ ,  $SD = 0.87$ ) on the level of use of vitamin supplements compared to the 76 female non-academic staff ( $M = 2.22$ ,  $SD = 0.84$ ). The results in Table 3 show the independent t-value of mean scores responses on level of vitamin supplements use based on gender of non-academic staff ( $t = -0.92$ ,  $p = .373$ ) the null hypothesis which states that there is no significant difference in the level of food supplement use among non-academic staff of tertiary institutions in Benue State based on gender was not rejected. This means that the level of food supplements use was the same for both males and females among non-academic staff of tertiary institutions in Benue State.

## **Discussion**

Data in Table 1 indicates low level of use of vitamin supplements among non-academic staff of tertiary institutions in Benue State. The result is surprising and not expected based on the observations of the researchers where there have been craving for the vitamin supplements. The level of vitamin supplement consumption found in this study is slightly lower than the medium level of dietary supplement consumption reported among staff of Obafemi Awolowo University, Ile-Ife (Ogunba & Iyiola, 2019). These findings contrast the result of a study that reported high level of use of vitamin supplements among postmenopausal women who were receiving therapy for low bone mineral density (Morton et al, 2018). It could be that for the postmenopausal women receiving therapy for low BMD, the use of vitamin supplements was recommended for them by their physicians unlike the non-academic staff of tertiary institutions in Benue State who may not have had special health need for vitamin supplements. The findings also disagree with the result of a systematic review in the US which reported high level of use of vitamin supplements among the study subjects in the US after cancer diagnosis (Velicer & Ulrich, 2018). This again could be attributed to the fact that adults in the US were cancer patients who deemed it necessary to use food supplements in managing their health conditions. These findings of low vitamin supplement use also contrast the result of a study that reported high level of use of vitamin supplements for COVID-19 prevention among a Japanese population (Chiba & Tanemura, 2022b). The reason for the variation in the findings could be that the prevalence of COVID-19 in Japan was higher than in Nigeria and could have caused heavy use of vitamin supplements with the intention of preventing COVID-19 among the Japanese population.

Results in Table 2 revealed that female participants had higher mean scores than their male counterparts on the level of use of vitamin supplements: vitamins (females  $\bar{x} = 2.22 \pm 0.84 >$  males  $\bar{x} = 2.11 \pm 0.87$ ). This result supports the findings of Salmean and Alhuwail (2018) which reported vitamin supplement use higher in females (76%) than males (74%). Velicer and Ulrich (2018) reported that, among breast and prostate cancer survivors, females reported higher use of vitamins supplements than males. Women use calcium products for bone health or for improving healthy skin appearance, whereas men are more likely to report supplement use for heart health or to lower cholesterol (Arthur, 2015). Further statistics reveal that the differences observed in the use of vitamin supplements were not significant based on gender ( $t = -0.92$ ,  $p = .372$ ). The findings on vitamin supplements use disagree with Radwan et al. (2019) who reported significant gender difference in the use of vitamin supplements among college students in the UAE with male students using amino acid supplements more than females for muscle mass; while female students preferred vitamin and mineral supplements more than males. This finding also contradicts Austin, Price, McGraw, and Lieberman (2018) in which the authors reported that the use of individual vitamins or minerals was significantly greater in males ( $p < 0.01$ ). Prevalence of protein and amino acid

use was higher in males ( $p < 0.01$ ). Use of combination products was significantly greater in males ( $p < 0.01$ ). The most commonly reported reasons for using supplements were to improve or maintain overall health. The result show that both male and female gender use of vitamin supplements depends on the need at a particular point in time.

## Conclusion

The study concluded that the women gender more than the male gender use vitamins supplements (females  $\bar{x} = 2.22 \pm 0.84 >$  males  $\bar{x} = 2.11 \pm 0.87$ ). Further statistic however revealed that there were no significant gender differences in the use of the vitamin supplements. Based on the conclusion, it is recommended that health committees in various tertiary institutions in Benue State should from time to time organize public enlightenment programme in the form of health education about safe use of vitamin supplements by male and female staff to minimise the potential toxicity of the food supplements used.

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