

Vitamin Use Among University Students: Prevalence, Knowledge, And Rational Use of Vitamin Supplements

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Abstract: Vitamin and mineral supplements are widely used by university students, particularly during periods of intensive study, examination stress and irregular nutrition. Although vitamins are essential for normal physiological functions, inappropriate supplementation, unnecessary high-dose intake and self-medication may result in avoidable risks. This article reviews the use of vitamin supplements among university students, with particular attention to their knowledge, reasons for use, sources of information, patterns of consumption and principles of rational supplementation. Students may use vitamins to support immunity, reduce perceived fatigue, compensate for an unbalanced diet or improve general wellbeing. However, the decision to use supplements should be based on nutritional needs and, when appropriate, professional advice rather than advertising or informal recommendations. The pharmacist has an important role in promoting responsible use by identifying potential risks, explaining appropriate dosage and duration, checking possible interactions and directing students to healthcare professionals when assessment is necessary. Improving students' health literacy and pharmaceutical counseling may reduce inappropriate self-medication and encourage evidence-based use of vitamin preparations.

Keywords: Vitamins, university students, vitamin supplements, nutritional knowledge, self-medication, rational use, pharmaceutical counseling, health literacy.

Introduction: Vitamins are biologically active organic compounds required in relatively small amounts for normal growth, metabolism, immune function and maintenance of physiological processes. Most vitamins cannot be synthesized by the human body in sufficient quantities and therefore must be obtained primarily through food. Vitamin requirements can vary according to age, physiological condition, dietary pattern and other individual factors.

University students represent a population in which nutritional habits may change considerably. Academic workload, irregular schedules, limited time for meal preparation, insufficient sleep and reliance on convenient foods can influence dietary quality. During

examination periods, some students may additionally perceive fatigue or reduced concentration and consequently turn to vitamin supplements. The popularity of such products is also influenced by advertising, social media, family recommendations and advice from friends.

Vitamin supplements can be useful when a deficiency or increased requirement has been established. Nevertheless, taking vitamins without an appropriate indication does not necessarily improve health or academic performance. Some vitamins are water-soluble, whereas fat-soluble vitamins can accumulate in the body. Therefore, excessive intake of certain vitamins may cause adverse effects. From a

pharmaceutical perspective, rational vitamin use means selecting an appropriate product, dose, duration and route according to the individual's needs and available evidence.

METHOD

Factors Influencing Vitamin Supplement Use Among University Students

The use of vitamin and mineral supplements among university students is influenced by a combination of nutritional, social, academic and psychological factors. Students may experience irregular meal patterns, limited food choices, changes in living conditions and increased academic demands. These circumstances can encourage some students to use supplements as a convenient way to compensate for perceived nutritional deficiencies. However, the decision to take a supplement should be based on an individual assessment of nutritional needs rather than on the assumption that every student requires additional vitamins.

Research conducted among university populations demonstrates that dietary supplement use is relatively common, although the prevalence varies considerably between countries and student groups. A study involving students from several universities in the United States found frequent use of multivitamin and mineral preparations as well as individual vitamin products. Students commonly reported general health, increased energy and physical performance among their reasons for using supplements. These findings indicate that students may associate vitamin preparations with improved wellbeing even when a nutritional deficiency has not been established.

The information available to students can strongly influence their decisions. Social media, online advertising, friends, family members and commercial websites can provide information about vitamins without adequately explaining their limitations or potential risks. As a result, students may select products based on popularity, positive personal experiences or promotional claims rather than scientific evidence. This situation is particularly important because dietary supplements can differ considerably in their composition, dosage and combinations of active ingredients. The National Institutes of Health emphasizes that supplement

products vary widely and that supplements should not be considered a replacement for a varied and nutritious diet.

Another important issue is self-medication. University students may begin taking vitamin preparations when they experience tiredness, reduced concentration, frequent illness or changes in appetite. However, these symptoms are not necessarily caused by vitamin deficiency. Fatigue, for example, may be associated with insufficient sleep, psychological stress, inadequate food intake, dehydration, excessive academic workload or an underlying medical condition. Therefore, using vitamins without identifying the actual cause of a symptom may delay appropriate assessment and treatment. Recent research has also found no consistent relationship between vitamin and mineral supplement use and reduced fatigue, demonstrating that supplementation should not automatically be considered a solution for tiredness.

The rational use of vitamin supplements requires attention to dosage and duration. Water-soluble vitamins are generally eliminated more readily through urine, although excessive intake of some water-soluble vitamins can still produce adverse effects. Fat-soluble vitamins, particularly vitamins A, D, E and K, can accumulate in the body and therefore require greater caution when used in high amounts. The risk may increase when students combine several products that contain the same vitamin or mineral. For example, a student may simultaneously use a multivitamin, a separate vitamin preparation and a fortified sports or energy product without realizing that the same nutrient is present in all of them.

Interactions between supplements and medicines should also be considered. Some vitamins and minerals can influence the absorption or effect of medicines, while certain medicines can affect nutrient status. Calcium and iron, for example, may interfere with the absorption of some medicines when taken together, and vitamin K intake is clinically relevant for people using certain anticoagulant medicines. For this reason, students who regularly use prescription or non-prescription medicines should inform a healthcare professional about all supplements they are taking. A complete assessment of the student's medication and supplement use can help prevent avoidable interactions.

The choice of a supplement should also take into account the student's dietary pattern. Students following vegetarian or vegan diets may have different nutritional considerations from students who regularly consume animal-derived foods. Vitamin B12 is naturally present in foods of animal origin, while fortified foods and supplements can provide alternative sources for people who consume little or no animal-derived food. Vitamin D intake may also require attention because relatively few foods naturally contain substantial amounts of this vitamin. Iron requirements and iron status can be particularly relevant for students with increased physiological needs or inadequate dietary intake. Nevertheless, supplementation should be based on dietary assessment and, when appropriate, laboratory evaluation rather than routine self-prescription.

The concept of rational supplementation is also important because a higher dose does not necessarily produce a greater health benefit. Students may believe that taking large amounts of vitamins will provide faster improvement in energy, immunity or academic performance. Such assumptions can encourage unnecessary high-dose supplementation. In reality, the biological effects of nutrients depend on physiological requirements, baseline nutritional status and the dose consumed. Therefore, appropriate supplementation should aim to correct or prevent a specific nutritional inadequacy rather than maximize nutrient intake.

The role of pharmacists is especially important in promoting safe vitamin use among university students. A pharmacist can assess the student's reason for choosing a supplement, review the product composition, identify duplicate ingredients and explain appropriate administration. Pharmacists can also ask about prescription medicines, dietary habits and other supplements that may contribute to interactions or excessive nutrient intake. When symptoms suggest a possible medical condition or nutritional deficiency, the pharmacist can recommend consultation with a physician or another qualified healthcare professional. Educational interventions at universities may improve students' ability to distinguish evidence-based information from commercial claims. Short educational programs, pharmaceutical counseling, informational materials and consultations with healthcare professionals can explain the difference between

dietary supplements and medicines, the importance of balanced nutrition and the potential risks of unnecessary supplementation. Research among university students has shown that supplement use can occur even when knowledge and safe-use practices are inadequate, supporting the need for targeted health-education programs.

An additional concern is the use of supplements marketed for concentration, energy and academic performance. University students may be attracted to products promoted as improving memory, reducing fatigue or increasing mental alertness. However, commercial claims should not automatically be interpreted as evidence of clinical effectiveness. The use of multiple products for the same purpose can also increase the likelihood of excessive intake or unwanted interactions. Consequently, students should evaluate the composition and evidence behind a product before deciding to use it.

Overall, rational vitamin supplementation among university students should be based on individual nutritional requirements, dietary habits, evidence of deficiency, appropriate dosage and consideration of possible interactions. Vitamins are essential nutrients, but supplementation is not universally necessary for healthy students who obtain adequate nutrients from a varied diet. Improving nutritional literacy and access to professional pharmaceutical counseling can help students make safer decisions and reduce unnecessary self-medication. In this context, pharmacists have an important role in

connecting scientific evidence with everyday health decisions and promoting responsible use of vitamin and mineral preparations among the student population.

1. Importance of vitamins for university students

Vitamins participate in numerous biochemical processes. B-group vitamins are involved in energy metabolism and normal nervous-system function, vitamin C contributes to antioxidant defense and normal immune function, while vitamins A, D, E and K have important roles in vision, bone health, antioxidant protection and blood coagulation. Adequate intake is therefore important for students as well as for the general population.

However, vitamins do not replace adequate sleep,

balanced nutrition, physical activity or appropriate management of academic stress. A supplement cannot compensate fully for a chronically poor diet. A varied diet containing vegetables, fruits, whole grains, legumes, dairy or suitable alternatives, eggs, fish, meat and other nutrient-rich foods remains the primary basis of vitamin intake.

2. Patterns of vitamin supplement use among students

Students may consume vitamin preparations in different forms, including tablets, capsules, effervescent formulations, powders and multivitamin combinations. Some use a single vitamin, while others choose multivitamin or vitamin-mineral products. The frequency and duration of use may vary from occasional consumption to daily long-term intake.

An important characteristic of student vitamin use is self-directed selection. Products may be chosen after seeing advertisements, reading online content or receiving recommendations from friends and relatives. Such behavior can be problematic because the student may not know whether a perceived symptom is related to a nutritional deficiency. Fatigue, for example, can have many causes, and simply taking a multivitamin may delay appropriate assessment of the underlying problem.

3. Knowledge and sources of information

The quality of information available to students can strongly influence their supplement choices. Reliable sources include physicians, pharmacists, registered dietitians, scientific publications and official health information. In contrast, social media posts, commercial advertisements and unverified online recommendations may exaggerate the benefits of vitamin products.

Health literacy should therefore include an understanding of the difference between nutritional adequacy and pharmacological dosing. Students should know that the term "vitamin" does not automatically mean "completely harmless." The dose, formulation, duration of use, individual health status and simultaneous use of other medicines or supplements all influence safety.

4. Rational use and potential risks

Rational use of vitamin supplements requires attention

to indication, dosage, duration and possible interactions. High-dose supplementation is particularly important because some vitamins can produce adverse effects when consumed excessively. Fat-soluble vitamins may accumulate in the body, while excessive intake of certain water-soluble vitamins can also be associated with undesirable effects.

Another concern is duplication. A student may simultaneously take a multivitamin, an individual vitamin preparation and a fortified food or beverage, unintentionally increasing total intake. Pharmaceutical counseling can help identify such duplication. The pharmacist should also ask about prescription and non-prescription medicines because supplements may affect treatment or may themselves be affected by other products.

5. The role of the pharmacist

Pharmacists are accessible healthcare professionals and can play a valuable role in promoting rational vitamin use among students. Before recommending a supplement, the pharmacist can clarify the student's purpose for use, current medicines and other supplements, dietary habits and relevant symptoms. When symptoms suggest a possible medical condition or nutritional deficiency requiring investigation, referral to a physician or other qualified healthcare professional is appropriate.

Counseling should include information about the product's composition, recommended dose, duration, administration and storage. Students should also be informed that taking more than the recommended amount does not necessarily produce a greater benefit. Clear counseling may reduce unnecessary supplementation and improve safe use.

6. Strategies for improving students' awareness

Universities can support better nutritional knowledge through educational seminars, health campaigns and evidence-based information materials. Pharmacy students themselves can participate in awareness projects by preparing educational content about vitamin sources, recommended intake, supplement safety and the risks of self-medication.

A practical research approach is to conduct an anonymous questionnaire among university students. Questions can assess which vitamins are used, frequency of use, reasons for supplementation, source

of advice, awareness of dosage and knowledge of possible risks. The resulting data can help identify educational gaps and provide a basis for targeted pharmaceutical counseling programs.

CONCLUSION

Vitamin supplements can be beneficial when they are used for an appropriate indication and in a suitable dose, but unnecessary or excessive consumption may provide little benefit and may create avoidable risks. University students are an important target group for educational interventions because academic pressure, irregular nutrition and exposure to online health information can influence their decisions about supplements.

Improving students' knowledge of vitamins should therefore focus not only on the benefits of supplementation but also on indications, dosage, duration, interactions and potential adverse effects. Pharmacists can contribute substantially by providing evidence-based counseling, identifying inappropriate self-medication and encouraging referral when professional medical assessment is needed. Promoting rational vitamin use among university students can support safer self-care and strengthen overall health literacy.

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