

## DO WE NEED SUPPLEMENTS?

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## ABSTRACT

Dietary supplements are produced in capsules, tablets, pills, and other similar forms, which are designed to be consumed as a dietary supplement. Most people today are aware of the role of nutrition in health, and they take supplements to improve the quality of their health, prevent diseases, supplement their diet, and boost their immunity. This study aims to analyze the knowledge of pharmacy students throughout Indonesia regarding the correct use of supplements. This study uses descriptive studies and administration of study instruments with a cross-sectional approach. The study instrument was a questionnaire with 10 questions. This study was conducted at Tanjung Pura University Pontianak in September 2023. The sampling method was random sampling with an accidental sampling technique. The number of samples collected for this study was 140 respondents. Almost all respondents had taken supplements, (99%; n=138). Based on the knowledge assessment score obtained through the questionnaire, it was found that 87% of pharmacy students throughout Indonesia had good knowledge of the correct selection and use of supplements and as many as 13% of students had poor knowledge of the correct selection and use of supplements. As many as 87% of respondents already knew about how to choose/use supplements correctly.

**Keywords:** Supplement, Nutrition, Multivitamin, Mineral

## INTRODUCTION

Indonesia is one of the countries with rapid technological advancement. One of them is the increasing number of social media users. All the information such as health, education, and entertainment will spread in a short time. In the health sector, people will find it easier to get information provided by health service providers. This will have an impact on people's lifestyles and increase public awareness of the importance of maintaining health and preventing

disease. (Stellefson et al., 2020 ; Leonita & Jalinus, 2018 ; Frey et al., 2017). The lifestyle of today's youth also contributes to the lack of nutritional intake, such as smoking and instant food consumption behavior, While they need growth, which can be fulfilled with a balanced intake of nutrition and nutrients. Lack or excess of nutrients can lead to health problems later in life. This has led to many people taking supplements (Wierzejska, 2021 ; Aina & Ojedokun, 2014).

Dietary supplements are additional products that contain various ingredients to supplement nutrients that cannot be met or found in daily meals, which are sold in various medicinal forms as food supplements. According to the Dietary Supplement Health and Education Act (DSHEA), dietary supplements are products that are intended to supplement the diet; contain dietary ingredients including vitamins, minerals, amino acids, herbs, and botanicals; are intended to be ingested as pills, capsules, tablets, or liquids; and are labeled as dietary supplements (Lwakatare & Mlimbila, 2023 ; Wierzejska, 2021 ; Hassan et al., 2020). The most commonly used supplements in the world are mineral and vitamin supplements (Zhang et al., 2020). Nevertheless, there is a growing trend in the consumption of fish oil, probiotics, and other non-nutritive compounds in society (Costa et al., 2019). Today, consumers of dietary supplements are not only athletes, gym goers, and bodybuilders, but the general public who feel the need to take supplements (Lwakatare & Mlimbila, 2023 ; Wardenaar et al., 2017).

Vitamins are a group of substances that are essential for normal physiology, in total each person needs 13 vitamins in sufficient quantities, namely four fat-soluble vitamins (A, D, E, K) and nine water-soluble vitamins, consisting of vitamin C and eight B vitamins: thiamine (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), vitamin B6, folate (B9), and vitamin B12 (Kennedy, 2016). Supplements popular among adults in the United States are multivitamins, vitamin D, vitamin C, protein, calcium B, vitamin or vitamin B complex, omega-3 fatty acids, green tea, magnesium, probiotics, iron, vitamin E, and

turmeric (Kamiński et al., 2020). The purpose of using health supplements is not to treat/replace the function of drugs to treat diseases, nor to replace daily food. Health supplements contain vitamins that can complement and correct vitamin deficiencies in certain conditions so that the immune system can function normally (BPOM, 2020).

The benefits and harms of taking supplements are still a topic that needs to be discussed. Based on the scale of supplement use, it would be wise to determine for whom, and to what extent, nutritional supplementation has beneficial effects and whether it lowers the risk of modern diseases. This study aims to analyze the knowledge of pharmacy students throughout Indonesia regarding the correct use of supplements.

## LITERATURE REVIEW

Food supplements are products used to supplement food nutritional needs, containing one or more ingredients in the form of vitamins, minerals, amino acids or other ingredients (of plant or non-plant origin) that have nutritional value and/or physiological effects in concentrated amounts (Medicine and Indonesia , 2004). Supplements can be solid products including tablets, lozenges, effervescent tablets, chewable tablets, powders, capsules, soft capsules, granules, pastilles, or liquid products in the form of drops, syrups or solutions (Nengah, 2020).

There are several types of supplements circulating in the community. The classification of food supplements based on their function consists of (Yuliarti, 2009):

1. Metabolite drugs to inhibit appetite (anorexigenicum)  
Anorexigenicum has the function of inhibiting appetite

so it is often claimed to be able to reduce a person's weight.

2. Medicine to lower fat and cholesterol (antilipidemic)  
Antilipidemic functions to reduce fat and cholesterol, this food supplement is often used to prevent diseases that arise due to high levels of fat and cholesterol in the body.
3. Medication to improve nutritional status (dietikum)  
Dietikum has the function of improving nutritional status, dietetic food supplements are often used to increase body weight or to increase appetite.
4. Generating energy and enthusiasm. Food supplements that generate energy and enthusiasm generally contain vitamins, minerals and plant (herbal) extracts such as ginseng and ginger.
5. Medicines to improve the metabolic system of certain organs. Food supplements that function to improve the metabolic system of certain organs include helping the metabolism of carbohydrates, fats, the formation of collagen structures and others. In general, food supplements contain iodine,

copper, manganese, zinc and others.

## RESEARCH METHODOLOGY

The data used in this study are primary data by distributing questionnaires to research subjects conducted online in September 2023. The research subjects were pharmacy students throughout Indonesia. This research method uses descriptive studies and administration of study instruments with a cross-sectional approach. The study instrument was a questionnaire with 10 questions. The sampling method was random sampling with accidental sampling technique. The number of samples collected for this study was 140 respondents. The data collection procedure carried out is that each respondent is given a questionnaire to be filled in without any intervention from the researcher. Each question answered by the respondent will get a score value of 10. The research data was entered in Microsoft Excel 2019 and the data was then presented in the form of a percentage (%) for categorical distribution data.

## RESSERACH RESULT

Table 1. Questionnaire Results

Variable	n(%)
<b>Ever taken supplements</b>	
Yes	138(99%)
No	2(1%)
<b>types of supplements taken</b>	
Antioksidan (vitamin C / vitamin A / Asam Folat / Menjadi C	66(47%)
Bone supplements (CDR/Calnic)	4(3%)
Immune supplements (Stimuno/ Immunos/ Immunvit)	27(19%)
Appetite-enhancing supplements (Curcuma)	9(6%)
Energy supplements (Kratingdeng/Caffeine)	10(7%)
Memory supplement (Cerebrofot x-cell)	3(2%)
Supplement/vitamin for skin health (Vitamin C + Collagen)	16(11%)

Neuropathic supplements/vitamins (Neurobion / Neurosanbe)	4(3%)
<b>Considerations in choosing which supplements/vitamins to take</b>	
As per current needs	118(84%)
Advice from family/relatives	10(7%)
Advice from health workers	12(9%)
<b>Frequency of taking supplements to support daily activities</b>	
Routine every day	14(10%)
Often (>4 times/week)	9(6%)
Seldom (1-3 times/week)	111(80%)
Never	6(4%)
<b>Considerations in choosing a supplement/vitamin brand</b>	
The quality of the nutrients contained in the supplement	101(72%)
Popular/largely bought by others	13(9%)
Famous brands	6(4%)
Affordable price (expensive/cheap)	20(14%)
<b>Purpose of taking supplements/vitamins</b>	
To maintain health and fitness	125(89%)
To prevent exposure to disease	8(6%)
Part of lifestyle	2(1%)
There is no spesific goal	5(4%)
<b>Period taking supplements/vitamins</b>	
< 6 months	67(48%)
6-12 months	13(9%)
1-2 months	22(16%)
>2 months	36(26%)
No answer	2(1%)
<b>Frequency of taking supplements/vitamins daily</b>	
Once a day	5(4%)
Twice a day	121(86%)
Three times a day	9(6%)
No answer	5(4%)
<b>Side effects while taking supplements/vitamins</b>	
There is no side effect	132(94%)
There is a side effect	7(5%)
No answer	1(1%)
<b>Results obtained after taking supplements/vitamins</b>	
The body feels healthy and optimized for daily activities	106(76%)
The body feels uncomfortable if you are not taking supplements	1(1%)
The body feels fine after eating/not eating	32(23%)
No answer	1(1%)

Before respondents filled out the questionnaire sheet, validity, and reliability tests were carried out on 30 people who had the same characteristics outside the research respondents. To measure the validity level of the instrument, the product-moment correlation level of Pearson was used using IBM SPSS Statistic

version 25.0. obtained the validity value of each question  $r_{xy} > r_{table}$ ;  $r_{table} = 0.3610$ . The  $r$  values for questions 1 to 10 are 0.642; 0.690; 0.642; 0.543; 0.418; 0.690; 0.367; 0.602; 0.762; and 0.592 respectively. This shows that all questions asked to respondents are valid. The reliability test uses

Cronbach's alpha coefficient. The instrument obtained realizable results with alpha Cronbach > 0.7 ( $\alpha = 0.792$ ). After all questions were confirmed valid and reliable, respondents were asked to answer the questionnaire.

Table 1. Shows the results of the questionnaire. Almost all respondents had taken supplements, (99%; n=138). Most of the respondents took antioxidants as daily food supplements (47%; n=66) and most considerations in taking supplements based on current needs (84%; n=118) and at least 10% of

respondents (n=7) took supplements based on recommendations from family/relatives. Respondents took supplements to maintain health and fitness (89%; n=125) and (4%) of the total respondents took supplements without a specific purpose. Side effects were only found in 5% of the total respondents. Most respondents felt healthy and optimal in doing daily activities after taking supplements (76%; n=106) and the least respondents felt uncomfortable if they were not taking supplements (1%, n=1).

**Table 2. Results Of Students' Knowledge Of The Role Of Supplements/Vitamins (N=140)**

No. Questions	respondents with good knowledge a (%)	respondents with poor knowledge b (%)
1 Supplements are needed in the following conditions:	122(87%)	18(13%)
2 What is meant by supplement		
3 Which includes micronutrients		
4 False statements about supplements		
5 Supplements for digestive health		
6 The dangers of supplements		
7 Unexpected effects of using the supplement		
8 Tips for choosing supplements		
9 Check "I" BPOM's on the word "KLIK" is		
1 Supplements that may interact with CoQ10		

a = number of respondents with score  $\geq 70$

b = number of respondents with score  $\leq 60$

Table 2 shows the results of students' knowledge of the use of supplements/vitamins. Based on the knowledge assessment score obtained through the questionnaire, it was found that 87% of pharmacy

students throughout Indonesia had good knowledge of the correct selection and use of supplements and as many as 13% of students had poor knowledge of the correct selection and use of supplements.

## DISCUSSION

Based on the results of the study, most pharmacy students have good knowledge regarding the use of supplements that are good and correct (87%;  $n = 122$ ). Based on previous research, the productive age of respondents has very good cognitive function so they have good knowledge (Nengah et al., 2020). In the United States, more than 50% of adults take supplements, in Poland about 30%-78% of adolescents and adults and about 40% of children take supplements and as many as 34.2% of adults in Korea take supplements (Park et al., 2023; Wierzejska, 2021). A quarter of people who take supplements are recommended by a doctor, which means that a large proportion of people take supplements based on their preferences (Wierzejska, 2021). Previous studies have shown that women, older age groups, people with higher education, patients with non-communicable diseases, cardiovascular disease, hypertension, and diabetes are more likely to take dietary supplements (Mahdavi-Roshan et al., 2021).

Previous research reported that a quarter of the total respondents (35.9%) took supplements based on their wishes and prescriptions (Lwakatare & Mlimbila, 2023). Based on previous research, supplements are not necessary for children who are well-nourished, instead, excessive food intake may jeopardize their health (Wozniak et al., 2023). People who train in fitness centers often consume whey protein, the highest protein fraction of milk, and amino acids to increase muscle mass. Usage in adolescent athletes is tailored to their needs and training goals while in adults it varies from 1.3g/kg/day - to 1.7 g/kg/day (Barretto et al., 2023 ; Master & Macedo, 2021 ;

Burke et al., 2019 ; Jäger et al., 2017).

More frequent multivitamin use ( $\geq 21$  days per 30 days) is effective in increasing micronutrient intake and reducing the risk of nutrient deficiencies by 58-76% for vitamins B6, B12, C, and D (Blumberg et al., 2017). In a previous study, it was found that 86% of respondents used supplements, most of whom were occasional users (Aina & Ojedokun, 2014). People take supplements to improve their health, prevent diseases, supplement their diet, and boost their immunity (Barretto et al., 2023). Research on female university students in Saudi Arabia shows that one of the reasons for taking supplements is to maintain a healthy body and hair (Alfawaz et al., 2017). According to previous studies, people who take supplements are largely unaware of the credibility and reliability of information from supplement products. They usually rely on advice from family, friends, mass media (television, magazines, newspapers, and the internet), doctors, pharmacists, nurses, dietitians, and nutritionists (Chowdhury & Chakraborty, 2017). Health professionals need to improve public understanding of the safety and effectiveness of dietary supplements and promote quality nutrition (Barretto et al., 2023).

The results of this study are in line with research conducted by Altamimi, 2019. It was found that most participants (66.4%) took supplements regularly without stopping and they said that there were benefits after taking supplements. Scientists and health experts agree that dietary supplements can be beneficial to human health under certain conditions. However, they should not replace complete and balanced



daily meals with foods necessary for a healthy diet (Fagaras et al., 2023). Most multivitamins available on the market do not fulfill 100% of the required micronutrients, and when there is a combination of more than one supplement, the risk of toxicity may increase, due to the coexistence of the same components at different doses. Should the main source of vitamins come from a balanced diet, supplements are indicated in situations of compromised nutritional status, restrictive diets, pregnancy, and risk and diagnosis of deficiency. Vitamin D can prevent rickets and osteomalacia. Vitamin D deficiency can be caused by lack of sun exposure, medication use, and metabolic defects. Excess vitamin D can cause hypercalcemia which will manifest into renal failure, hypercalciuria, or nephrocalcinosis (Barretto et al., 2023 ; Martini et al., 2020). For the prevention of vitamin D deficiency, vitamin D3 (cholecalciferol) and vitamin D2 (ergocalciferol) are recommended (Brustad et al., 2022). According to previous studies, there is no further benefit from vitamin C supplementation in individuals at high risk of cardiovascular disease (Lykkesfeldt, 2020).

Some supplements contain active substances that have strong effects on the body and can cause side effects, especially when taken in place of prescribed medication or when taken together with other types of supplements, such as antioxidants like vitamins C and E, which can make some chemotherapy drugs less effective (Society, 2021 ; Altamimi, 2019). Supplements can have components according to the product description that cause certain side effects. Supplements can also be intentionally spiked with unregistered or illegal compounds or drugs such as anabolic steroids

(Ronis et al., 2018). Large doses of fatty acids can lead to the organism's inability to form some muscle proteins. Doping/performance-enhancing drugs may cause endocrine disruption (Hassan et al., 2020). The effects of taking supplements differ from individual to individual, with the biggest effect being that the body feels fit and healthy. This is related to the genetic basis. Lifestyle, environment, diet, age, and health conditions affect the body's response to supplements (Nengah et al., 2020).

Health and nutrition experts differ on whether it is appropriate to include recommendations for nutrient-containing dietary supplements in national health promotion and disease prevention recommendations. Many countries choose to recommend that adequate nutrient intake for the general population be obtained from food alone and reserve specific nutrient supplement recommendations for specific subgroups within the population. Other countries recommend food alone with no recommendations for special populations (Dwyer et al., 2018).

## CONCLUSION

87% of the total respondents already knew how to choose/use supplements correctly. Supplements have good benefits when consumed as a complement to food and in accordance with the recommended dose, but there are some supplements that have side effects if consumed together with other supplements.

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