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Attitudes and Knowledge of Sports Science Students Regarding Herbal-Based Sports Supplements

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Abstract

This study aims to analyze the attitudes and knowledge levels of physical education students regarding the use of herbal sports supplements. The method used was a quantitative survey with a cross-sectional design. The study subjects were physical education students who completed a Likert-scale attitude questionnaire and a knowledge test on herbal supplements. The data were analyzed descriptively to examine the distribution of attitudes and knowledge levels across several domains. The results indicate that students' knowledge levels were relatively high across all domains, including definitions, safety, regulations, and usage practices, although the aspect of effectiveness showed relatively lower scores. However, students' attitudes toward the use of herbal sports supplements tended to fall into the neutral category across cognitive, affective, and conative aspects. This indicates that the knowledge possessed has not yet been fully internalized into strong attitudes and behavioral tendencies. The conclusion of this study indicates a gap between students' knowledge and attitudes regarding the use of herbal supplements. Given the vast potential of herbal resources in Indonesia and the role of sports science students as future academics and practitioners, more comprehensive and evidence-based educational efforts are needed to support the appropriate and responsible use of herbal sports supplements.

Keywords: attitudes, knowledge, college students, sports supplements, herbs

Introduction

The development of modern sports has been marked by increasing demands for athletes' physical performance and health. One approach widely used to support these demands is the utilization of sports supplements. Supplements are used not only to enhance performance, but also to accelerate recovery and maintain optimal physical condition (Maughan et al., 2018).

In recent years, herbal-based sports supplements have gained increasing attention. Herbal-based products generally originate from natural ingredients, particularly plants, which are believed to provide certain physiological benefits. This trend is driven by the perception that natural ingredients tend to be safer and have fewer side effects compared to synthetic products (Baltazar-Martins et al., 2019). Nevertheless, the use of herbal supplements in sports contexts still requires adequate understanding, considering the variability of ingredients, the limited scientific evidence supporting some products, and the potential implications for health and sports regulations (Garthe & Maughan, 2018).

Indonesia is a country with high biodiversity, including a rich variety of herbal plants that have long been utilized in traditional medicine. Various plant species have the potential to be developed into supplements that support sports performance (Sarker & Nahar, 2020). However, the utilization of these herbal resources in the field of sports remains relatively limited and has not been optimally integrated with scientific approaches and evidence-based practices (Petrovska, 2021). This condition indicates a gap between the potential of natural resources and their application within the context of modern sports.

In the educational context, sports science students represent an important group as future professionals in the field of sports, including coaches, educators, and other practitioners. Their knowledge and attitudes toward supplement use, particularly herbal-based supplements, may influence the practices they adopt and recommend in the future (Knapik et al., 2022). Therefore, it is important to understand how sports science students perceive and respond to the use of herbal-based sports supplements.

Studies on the use of sports supplements have been widely conducted; however, most have focused on supplements in general and have not specifically examined herbal-based supplements. In addition, studies integrating both knowledge and attitude aspects within a single investigation remain limited, particularly among sports science students (Braun et al., 2019).

Based on this background, this study aimed to analyze the level of knowledge and attitudes of sports science students toward the use of herbal-based sports supplements. The findings of this study are expected to provide preliminary insights into the current condition and serve as a basis for developing more targeted educational strategies.

Methods

Research Design

This study employed a quantitative survey design with a cross-sectional approach.

Research Setting and Period

The study was conducted at the Faculty of Sport and Health Education, Universitas Pendidikan Indonesia, Bandung, Indonesia.

Participants

The participants consisted of 100 students from the Faculty of Sport and Health Education.

Instruments

The instruments used in this study were an Attitude Questionnaire and a Knowledge Test regarding the use of herbal-based sports supplements. Both instruments were distributed online using a digital questionnaire form.

Data Collection Procedure

Data collection was conducted online by distributing digital questionnaires to participants who met the inclusion criteria. Participation in the study was voluntary, and respondents completed the questionnaire independently.

Data Analysis

The collected data were analyzed using descriptive statistical methods to summarize participants' knowledge and attitudes regarding the use of herbal-based sports supplements.

Results

A total of 100 students completed the online questionnaire. The demographic characteristics of the respondents are presented in Table 1. Most respondents were first-year students (57%), followed by second-year students (32%), third-year students (8%), and fourth-year and above students (3%). Based on gender, male respondents accounted for 59% of the sample, while female respondents represented 41%. Regarding sports participation, the majority of respondents were amateur athletes (51%), followed by non-athletes (27%), professional athletes (16%), and students involved as committee members in sports organizations (6%). Overall, the respondents were predominantly early-year students, with a higher proportion of males and active involvement in sports activities, particularly at the amateur level.

Table 1
Demographic Characteristics of Respondents (n = 100)

Characteristics	Category	n (%)
Academic Year	Year I	57 (57)
	Year II	32 (32)
	Year III	8 (8)
	Year IV and above	3 (3)
Gender	Male	59 (59)
	Female	41 (41)
Participation in Sports	Non-athlete	27 (27)
	Amateur athlete	51 (51)
	Professional athlete	16 (16)
	Sports organization committee member	6 (6)

Table 2
Students' Attitudes toward Herbal-Based Sports Supplements

Attitude Component	Indicator	Number of Respondents Selecting Scale:				
		1	2	3	4	5
Cognitive	Perceived Safety	2	1	32	45	20
	Perceived effectiveness	2	3	47	37	11
	Perceived risk	2	4	40	34	20
	Comparisson with other supplements	1	5	49	33	12
Affective	Preference	0	8	44	30	18
	Believe in benefits	2	4	40	34	20
Conative	Intention to recommend	1	5	49	33	12
	Intention ro recommend	2	6	54	28	10

The distribution of students' attitudes toward herbal-based sports supplements is presented in Table 2. Overall, most respondents tended to select scale 3 (neutral) across nearly all attitude indicators, indicating a generally neutral attitude toward herbal-based sports supplements.

Within the cognitive component, the perceived safety indicator showed a relatively positive tendency, with most respondents selecting scales 4 and 5. However, for perceived effectiveness, perceived risk, and comparison with other supplements, the majority of responses remained at scale 3, suggesting that respondents did not hold strong beliefs regarding these aspects.

In the affective component, both preference and belief in benefits were predominantly neutral. This finding indicates that respondents had not yet developed a clear emotional attitude toward the use of herbal-based sports supplements.

Similarly, within the conative component, the indicators related to intention to recommend and intention to use herbal-based sports supplements were also dominated by neutral responses. This suggests that respondents had not yet demonstrated a strong behavioral tendency toward the use of herbal-based sports supplements.

Students' knowledge levels regarding herbal-based sports supplements are presented in Table 3. Overall, respondents demonstrated high levels of knowledge across all measured domains.

Knowledge regarding the definition of herbal-based sports supplements showed a correct response rate of 95%. Similarly, knowledge in the safety domain was also high, with 96% of respondents answering correctly, indicating a good understanding of the safety aspects associated with herbal supplement use.

In the regulatory domain, 92% of respondents provided correct answers, while knowledge regarding practical use reached 88%. The relatively lowest level of knowledge was found in the effectiveness domain, with a correct response rate of 84%, although this value still falls within the high category.

Overall, these findings indicate that students possessed good knowledge regarding various aspects of herbal-based sports supplements, although some variation across domains was observed.

Table 3
Students' Knowledge Level Regarding Herbal-Based Sports Supplements

Domain	Number of Respondents Answering Correctly n (%)	Number of Respondents Answering Incorrectly n (%)
Knowledge of the definition of herbal-based sports supplements	95 (95)	5 (5)
Knowledge of the safety of herbal-based sports supplements	96 (96)	4 (4)
Knowledge of the effectiveness of herbal-based sports supplements	84 (84)	16 (16)
Knowledge of regulations related to herbal-based sports supplements	92 (92)	8 (8)
Knowledge of the practice of using herbal-based sports supplements	88 (88)	12 (12)

Discussion

The findings of this study indicate that students' attitudes toward the use of herbal-based sports supplements tended to be neutral. From the perspective of attitude theory (cognitive–affective–conative), this condition may reflect that attitudes have not yet been fully developed, even though individuals already possess some information regarding the attitude object (Eagly & Chaiken, 1993).

Theoretically, attitude formation is influenced not only by knowledge, but also by direct experience, social influence, and repeated exposure to information. This explains why, despite the relatively high level of knowledge among students, the attitudes formed have not demonstrated a strong tendency. This phenomenon is consistent with the concept that declarative knowledge does not necessarily become internalized into stable beliefs or preferences (Ajzen & Fishbein, 2000).

In addition, the characteristics of herbal-based supplements, which are often associated with being "natural" and "safe," may create ambiguous perceptions. On one hand, there is a tendency to accept herbal products; on the other hand, the limited and inconsistent scientific evidence regarding their effectiveness and safety may generate uncertainty. This condition may result in unclear or ambivalent attitudes (Bent, 2008).

From a behavioral perspective, weak attitudes are generally not followed by clear intentions or actions. This is consistent with the Theory of Planned Behavior, which states that weak attitudes contribute to lower intentions to perform a particular behavior (Ajzen, 1991). Therefore, the neutral tendency in students' attitudes may explain the absence of a consistent intention to use or recommend herbal-based sports supplements.

These findings also indicate that education regarding herbal-based sports supplements should focus not only on increasing knowledge, but also on developing attitudes through more practical approaches, such as case studies, practical experiences, and balanced exposure to both risks and benefits (Petróczi et al., 2022). Through such approaches, students are expected to develop more critical and evidence-based attitudes in evaluating supplement use.

The generally high level of students' knowledge indicates that information related to herbal-based sports supplements has been relatively accessible to respondents. From the perspective of cognitive theory, knowledge serves as an initial foundation in the formation of attitudes and behaviors, particularly in the context of health- and sports-related decision-making (Glanz et al., 2015). Nevertheless, a high level of knowledge does not always reflect deep or practical understanding.

Differences in knowledge levels across domains, particularly the relatively lower score in the effectiveness domain, may be explained by the nature of the information itself. Definitions and safety aspects tend to be more general and easier to understand, making them easier for respondents to remember. In contrast, the effectiveness of herbal supplements depends heavily on scientific evidence, which is often complex, contextual, and not always consistent (Maughan & Burke, 2019).

Furthermore, the high level of knowledge regarding regulatory aspects indicates awareness of the importance of legal considerations in supplement use. However, in practice, knowledge of regulations does not necessarily correspond with the ability to identify products that are safe or compliant with existing standards. This suggests the presence of a gap between declarative knowledge and procedural knowledge (Mazanov et al., 2021).

These findings may also be associated with the phenomenon of the knowledge–behavior gap, in which individuals possess adequate knowledge

but are not always able to apply it in actual behavior (Kwasnicka et al., 2016). In this context, although students demonstrated good levels of knowledge, this does not necessarily directly influence their attitudes or appropriate supplement-use practices.

Therefore, the findings of this study suggest that educational efforts should focus not only on increasing knowledge quantitatively, but also on deepening critical understanding, particularly regarding the effectiveness and practical use of herbal-based supplements. Evidence-based educational approaches are important to help students interpret information more accurately and apply it appropriately (Backhouse et al., 2021).

Conclusions

Sports science students demonstrated a good level of knowledge regarding herbal-based sports supplements. However, the findings of this study indicate that their attitudes toward the use of such supplements tended to remain neutral and therefore did not fully support the development of clear usage behaviors. These findings suggest that high levels of knowledge do not necessarily correspond with strong attitudes or behavioral intentions regarding the use of herbal-based sports supplements.

From a practical perspective, the findings indicate the need for more comprehensive and evidence-based educational approaches related to herbal-based sports supplements, particularly in strengthening students' critical understanding of effectiveness, safety, and practical use. Educational strategies that integrate scientific evidence with practical application may help improve students' attitudes and decision-making related to supplement use.

This study has several limitations, including the relatively limited sample size and the inclusion of respondents from only one institution, which may affect the generalizability of the findings. Therefore, future studies are recommended to involve broader and more diverse populations from multiple institutions. In addition, intervention-based studies evaluating changes in knowledge and attitudes before and after educational programs are needed to provide a deeper understanding of the effectiveness of educational approaches related to herbal-based sports supplements.

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