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# STUDENTS' KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING METABOLIC SYNDROME: AN IN-DEPTH SUMMARY

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## Abstract

Metabolic Syndrome (MetS) is a growing public health challenge worldwide, characterized by a cluster of metabolic risk factors that increase the likelihood of cardiovascular disease and diabetes [1][2]. This study explores the knowledge, attitudes, practices, and beliefs (KAPB) of university students in Albania regarding MetS, with a focus on obesity, hypertension, and lipid disorders. Given the limited data on young populations in Albania [15], assessing students' awareness is critical since they represent future healthcare professionals and potential agents of preventive change.

## Introduction and Background

Metabolic Syndrome is one of the most serious public health challenges of the 21st century, characterized by a combination of risk factors including abdominal obesity, high blood pressure, lipid imbalances, and glucose metabolism disorders [1][3]. In an era of urbanization and sedentary lifestyles, MetS has become a "silent epidemic" [2], with severe consequences for individuals and society [5].

In Albania, a developing country with limited resources, understanding the younger generation's knowledge and attitudes is essential. These students are future healthcare providers whose training affects the success of preventive policies [13] [15].

## Definition and Diagnostic Criteria of Metabolic Syndrome

MetS does not represent a single diagnosis but a cluster of metabolic disorders. According to IDF and ATP III guidelines, diagnosis is confirmed when at least three out of five criteria are met: abdominal obesity, hypertension, hyperglycemia, elevated triglycerides, and low HDL cholesterol [1][3].

## Epidemiology of Metabolic Syndrome

Globally, MetS affects about 20–25% of adults [4], with higher rates in Southern and Eastern Europe [5]. In Albania, prevalence ranges from 22% in the general population to 33% in middle-aged women [15].

However, data on young people remain scarce, emphasizing the importance of this research.

**Pathophysiological Mechanisms of MetS**

The pathophysiology of MetS involves hormonal, metabolic, and inflammatory pathways [8]. Insulin resistance is central [1][2], while visceral adiposity drives inflammation and cardiovascular damage [5] [6]. Hypertension and atherogenic dyslipidemia perpetuate this cycle [3][6].

**Obesity and Its Health Consequences**

Obesity, particularly abdominal fat, is central to MetS [9]. Over 1 billion people globally are obese [9], and over half of Albanian adults are overweight [15]. Causes include poor diet, inactivity, and stress. Consequences range from cardiovascular disease to infertility and cancer [7].

**Type 2 Diabetes and Youth**

The rise in type 2 diabetes among youth signals systemic gaps [10]. Risk factors include obesity, poor diet, sleep disorders, and stress. This calls for early educational intervention across curricula [14].

**Socioeconomic Impact of MetS**

MetS disproportionately affects lower socioeconomic groups due to limited access to healthy food and healthcare, perpetuating health inequities [12][15].

**The Role of Nurses in Preventing MetS**

Nurses are central to MetS prevention through education and early intervention [13]. Future nurses must acquire both theoretical and practical skills in prevention and lifestyle counseling [13][14].

**Literature Review and Critical Insight**

Studies reveal gaps in student knowledge, particularly outside health disciplines [14]. Misconceptions about stress, hypertension, and treatment methods persist. The KAPB model provides an effective framework for understanding and addressing these gaps [14].

## STUDY METHODOLOGY

*Logical Framework of the Study:* This study is based on the KAPB model (Knowledge, Attitudes, Practices, and Beliefs) [14] and aims to assess students' awareness and behaviors regarding MetS, focusing on obesity, hypertension, and lipid disorders. The framework is adapted from similar models used in international studies.

*Long-Term Goal (Impact):* Strengthening the professional capacities of future nurses for effective prevention and management of MetS.

*General Objective:* To assess the level of knowledge, attitudes, and perceptions among university students regarding MetS, identify educational gaps, and determine the influencing factors for prevention.

*Specific Objectives:* Evaluate knowledge of MetS risk factors and consequences. Identify attitudes towards lifestyle changes vs. pharmacological treatment. Assess willingness to adopt lifestyle changes.

Highlight misconceptions affecting behavior.

*Main Question:* Do students have sufficient knowledge about MetS, and to what extent do they apply preventive measures in daily life?
*Supporting Questions:* What is the level of knowledge and attitudes toward obesity, hypertension, and dyslipidemia? How informed are they about the long-term consequences of these conditions? Do they consider lifestyle changes important and feasible?

**Study Design and Type**

*Type:* Descriptive, quantitative, cross-sectional.

*Methodological approach:* Use of structured questionnaires to gather KAPB-related data.

*Nature of the Study:* This is a non-experimental, exploratory, and descriptive study. It does not test cause-effect hypotheses but aims to guide findings across demographic groups.

*Population and Sample:* The population includes all Students of Albanian University ($N \approx 1400$). The sample size is 513 students, randomly selected to ensure adequate representation.

The only inclusion criteria are Registered students in various programs, willing to participate. The only exclusion criteria are Refusal to participate or improper questionnaire completion.

**Data Collection**

*Instrument:* Structured questionnaire divided into four sections: Demographics (age, gender, year, field of study); Knowledge about obesity, hypertension, and dyslipidemia; Practices and behaviors regarding lifestyle, nutrition, and health care; Attitudes and beliefs (Likert scale).

*Question type:* Mostly closed-ended with Likert scales.

*Distribution method:* Online via Google Forms.

*Data Collection and Analysis:* Descriptive and chi-square statistics were applied ($p < 0.05$). Data visualization included tables and charts.

**Study Limitations**

Limitations include self-reported data, a single-institution sample, and the descriptive nature of the design [14].

**Ethics and Approval**

Participants gave informed consent. Data collection complied with confidentiality principles and received institutional approval.

**Preliminary Data Analysis**

This report presents the statistical and visual analysis of data collected from a study involving 513 university students regarding their knowledge, attitudes, and perceptions related to obesity, hypertension, and blood lipid disorders. Students showed moderate knowledge. For example, only 20.8% knew the correct BMI for obesity [9]. Attitudes toward lifestyle change were generally positive, but diagnostic knowledge was limited. The data are presented through combined tables to facilitate interpretation.

*Table 1: Demographic characteristics and basic knowledge of participants*

| | n (513) | % |
|---|---|---|
| *Gender* | | |
| Female | 432 | 84.2 |
| Male | 81 | 15.8 |
| *Age* | | |
| 18–20 years | 294 | 57.3 |
| 21–23 years | 128 | 25 |
| 24–26 years | 28 | 5.5 |
| Over 26 years | 63 | 12.3 |
| *Year of study* | | |
| First year | 110 | 21.4 |
| Second year | 302 | 58.9 |
| Third year | 37 | 7.2 |
| Fourth year or higher | 64 | 12.5 |
| *Family history of obesity, hypertension, or lipid disorders* | | |
| Yes | 193 | 37.6 |
| No | 256 | 49.9 |
| Don't know | 64 | 12.5 |

*Table 2: Attitudes toward obesity, hypertension, and cholesterol*

| Statement | Strongly Disagree % | Disagree % | Neutral % | Agree % | Strongly Agree % |
|---|---|---|---|---|---|
| Obesity is a serious problem requiring immediate intervention. | 4.1 | 7.8 | 32.6 | 30.4 | 25.1 |
| Hypertension can only be prevented if there is a genetic predisposition. | 34.7 | 27.1 | 24.4 | 5.5 | 8.4 |
| Diet and physical activity are more effective than medication in managing high cholesterol. | 7.6 | 15.8 | 34.3 | 23.8 | 18.5 |
| I am willing to change my lifestyle to prevent these health problems. | 5.8 | 5.3 | 16.8 | 34.7 | 37.4 |

Table 3: Perceptions and myths about cardiometabolic health

| Statement | Strongly Disagree % | Disagree % | Neutral % | Agree % | Strongly Agree % |
|---|---|---|---|---|---|
| Hypertension and high cholesterol are not a problem for young people. | 51.3 | 21.8 | 18.7 | 3.7 | 4.5 |
| I can be healthy regardless of my weight. | 25 | 24.4 | 30.2 | 12.5 | 8 |
| Medication is the only way to lower blood pressure and cholesterol. | 31 | 27.9 | 28.1 | 7 | 6 |

*Demographic Characteristics*

- Gender: 84.5% female and 15.5% male, reflecting a predominance of female participation, possi-

bly due to the gender composition of the study program or greater interest in the topic.

- Age: 57.4% are aged 18–20, 24.9% are 21–23, and 12.3% are over 26, reflecting a typical university population profile.
- Year of study: The majority are in the second year (59%), followed by first-year (21.4%) and fourth-year students (12.5%).

*Knowledge on Metabolic Syndrome (MS)*

- BMI for obesity: Only 20.8% provided the correct answer (≥ 30 kg/m²), while 39.9% said they did not know.
- Hypertension factors: 37.9% correctly identified salt intake as a main factor, although 27.5% selected stress.
- Causes of obesity: 74.7% identified unhealthy eating as the main cause, indicating high awareness.
- Effect of cholesterol: Only 20.8% correctly identified atherosclerosis as a consequence of high cholesterol; 48.8% incorrectly selected diabetes.
- Healthy fats: 67.4% selected avocado, showing good nutritional knowledge.
- Normal blood pressure: 73.4% correctly answered (≤ 120/80 mmHg).
- Total cholesterol: Only 26.8% gave the correct value (< 200 mg/dL), while 35.3% said they did not know.

*Attitudes and Beliefs*

- Obesity as a serious issue: 61.4% were fully or strongly in agreement, reflecting high awareness.
- Hypertension prevention: 55.5% expressed belief in the role of lifestyle.
- Genetic role: 62.5% disagreed or strongly disagreed with the idea that hypertension is solely genetic.
- Cholesterol and age: 73.4% disagreed with the notion that cholesterol only affects the elderly, indicating a correct understanding of risk.

**Table 4: Analysis of attitudes using Likert scale**

| Statement | Mean | Standard Deviation |
|---|---|---|
| Obesity is a serious problem requiring immediate intervention | 3.65 | 1.06 |
| Hypertension is solely linked to genetics | 2.26 | 1.22 |
| Diet and physical activity are more effective than medication in managing high cholesterol | 3.30 | 1.16 |
| I am willing to change my lifestyle to prevent these problems | 3.93 | 1.13 |

*Interpretation:*

- The most positive attitude is linked to the willingness to change lifestyle.
- The most negative attitude relates to the belief that hypertension is mainly genetic, indicating good knowledge of risk factors.
- Standard deviations >1 reflect moderate variability in opinions, especially on more debatable topics.
- *Statistical* *Analysis*

A chi-square test was applied to assess the association between the year of study and the statement: "Diet and physical activity are more effective than medication in managing high cholesterol."

Result: $\chi^2 = 14.8$, df = 8, p = 0.062

- Interpretation: No statistically significant association was found ($p > 0.05$), indicating that attitudes on this issue do not significantly vary by year of study.

**General Assessment and Conclusions**

The data provide valuable insight into students' knowledge and attitudes toward metabolic syndrome. While students showed good awareness of some risk factors (diet, blood pressure), there were significant gaps in diagnostic understanding [1][3][6]. Positive attitudes suggest a willingness to change behavior, yet misconceptions about genetics and medication persist [8] [14].

1. Metabolic Syndrome represents a multifaceted health issue influenced by biological, social, and educational factors, with rising prevalence among young people in Albania.
2. Students demonstrate moderate knowledge of MetS risk factors but lack sufficient understanding of diagnostic criteria and long-term health consequences.
3. Positive attitudes toward lifestyle changes are evident, indicating readiness to adopt preventive behaviors.
4. Misconceptions persist, particularly regarding genetic causes and medication efficacy, which may hinder effective prevention.
5. The use of self-reported data and the focus on a single university limit generalizability of findings.

**Recommendations**

1. Integrate MetS-focused education across curricula [14].
2. Run targeted awareness campaigns [13].
3. Empower nursing education for community health roles [13] [14].
4. Establish a national KAPB database for youth [15].
5. Promote interdisciplinary research and tailored interventions [14].
6. Strengthen early education on diet and exercise [10] [14].
7. Improve policy coordination to reduce socioeconomic barriers [12] [15].

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