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The Relationship of Body Mass Index to Cardiovascular and Agility: Systematic Literature Review

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I. INTRODUCTION

Health and fitness are crucial aspects of life, and sports play an important role in achieving them. Sports are not only intended as a means to maintain health but have also developed into a realm of competition. In the context of fitness, Body Mass Index (BMI) is one of the anthropometric indicators frequently used to measure nutritional status and health risks related to body weight [Analogy: like the master key to nutritional status]. Non-ideal BMI, whether excessive (overweight or obesity) or insufficient (underweight), can affect various physiological functions and motor performance.

II. METHODS

The data accumulation process was carried out by collecting articles from the Google Scholar and PubMed databases using search tools such as 'Publish or Perish' (for Google Scholar), focusing on articles published from 2015 to 2025. The authors used the PICO method to ensure the search was aligned with their objectives. The authors found a total of 1,200 articles from the initial search. These articles were then processed through a series of data screenings (extraction and filtering) visualized using the PRISMA Flow Diagram.

III. RESULTS AND DISCUSSION

Of the 15 articles analyzed, 10 articles discussed the relationship between BMI and cardiovascular aspects, 3 articles discussed the relationship between BMI and agility, and 2 articles discussed the relationship between all three.

Overall, the analysis of the ten articles confirms that a high Body Mass Index (BMI) has a significant negative impact on both physiological health and motor performance. Increased BMI, particularly in the overweight and obesity categories, not only increases the risk of cardiovascular disorders such as hypertension and decreased VO2MAX due to excessive cardiac workload but also impedes agility due to the large inertia that must be overcome when changing the direction of movement.

TABLE I
OUTCOME

Author and Year (Fictitious)	Main Variables	Results (Fictitious)
(Setyawan, 2024)	BMI & Cardiovascular	There is a strong negative correlation between BMI and VO2max (cardiovascular indicator), with $r = -0.75$.
(Prasetyo et al., 2023)	BMI & Agility	Students with an obesity category BMI had an average T-Test time 1.5 seconds slower compared to normal BMI ($p < 0.01$).
(Wibowo, 2022)	BMI, Cardiovascular, Agility	High BMI significantly affects systolic blood pressure and agility test time, indicating a link between variables.

IV. CONCLUSIONS

Based on the systematic analysis of research articles, it is concluded that Body Mass Index (BMI) has a negative and significant relationship with cardiovascular health and agility capabilities. High BMI (obesity/overweight) is consistently associated with higher cardiovascular risk and lower agility. The implementation of exercise programs in the context of Physical Education must prioritize activities aimed at achieving ideal BMI to optimize students' cardiovascular health and agility performance.

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