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A NARRATIVE REVIEW OF STUDENT PERCEPTIONS OF RESPONSE EFFICACY AND SELF-EFFICACY FOR CARDIOVASCULAR DISEASE PREVENTION THROUGH PHYSICAL ACTIVITY

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ABSTRACT

Background: Cardiovascular disease (CVD) remains the leading cause of mortality worldwide, yet its modifiable risk factors often originate during adolescence and young adulthood. University students experience substantial lifestyle changes characterized by reduced physical activity, prolonged sedentary behavior, academic stress, and unhealthy habits, increasing their long-term cardiovascular risk. Despite strong evidence supporting regular physical activity as an effective preventive strategy, adherence to recommended activity levels remains consistently low among this population.**Objective:** This narrative review aims to synthesize current evidence on university students' perceptions of cardiovascular disease risk, with particular emphasis on the concepts of threat appraisal, response efficacy, and self-efficacy within the framework of the Protection Motivation Theory (PMT) and the Health Belief Model (HBM). It also explores the major barriers influencing physical activity participation among university students.**Methods:** A comprehensive narrative review was conducted using peer-reviewed literature examining cardiovascular disease risk perception, physical activity behaviors, health behavior theories, and psychosocial determinants among university students. Evidence from international studies, with particular attention to South Asian and Indian populations, was critically synthesized.**Results:** The reviewed literature indicates that although most university students recognize the general health benefits of physical activity, they frequently underestimate their personal susceptibility to cardiovascular disease due to optimism bias and inadequate

scientific understanding of cardiovascular pathology. While response efficacy toward exercise is generally positive, motivation is primarily driven by immediate benefits such as stress reduction, physical appearance, and fitness rather than long-term disease prevention. Self-efficacy is substantially compromised by perceived response costs, including academic workload, time constraints, fatigue, lack of motivation, limited social support, and inadequate access to recreational facilities. Female students consistently report greater barriers to physical activity than males owing to sociocultural and environmental constraints. These findings collectively contribute to persistently low physical activity levels despite adequate awareness of its benefits.**Conclusion:** The prevention of cardiovascular disease among university students requires interventions that extend beyond traditional health education. Strategies should focus on enhancing perceived susceptibility, strengthening self-efficacy, reducing structural and environmental barriers, and creating supportive, gender-sensitive environments that facilitate sustained physical activity. Applying behavioral frameworks such as PMT and HBM can guide the development of targeted interventions aimed at improving cardiovascular health behaviors during early adulthood.

KEYWORDS: Cardiovascular disease, Physical activity, University students, Risk perception, Protection Motivation Theory, Health Belief Model, Self-efficacy, Response efficacy, Sedentary behavior, Narrative review.

INTRODUCTION

Cardiovascular diseases (CVDs) remain the leading cause of global mortality, claiming approximately 17.9 million lives annually[1]. While the clinical manifestations of CVDs typically emerge in middle to late adulthood, the behavioral and biological antecedents are firmly established during adolescence and young adulthood[1]. The transition into higher education is a critical developmental period marked by increased autonomy, but it is also associated with a precipitous decline in physical activity and the adoption of sedentary lifestyles[6].

Current epidemiological data and public health guidelines, including those from the World Health Organization (WHO), emphasize the biological efficacy of engaging in 150 to 300 minutes of moderate-intensity aerobic physical activity per week to mitigate cardiovascular risk[8]. Regular physical activity yields well-documented physiological benefits, such as reducing systolic and diastolic blood pressure, improving insulin sensitivity, and positively altering blood lipid profiles[4]. Despite these established benefits, a substantial proportion of

young adults and university students fail to meet these guidelines globally[9].

To understand this behavioral deficit, researchers frequently utilize socio-cognitive theories to evaluate how young adults perceive health threats and their ability to adopt preventative measures. The purpose of this narrative review is to synthesize the existing literature on university students' perceptions of cardiovascular disease risk, with a specific focus on *response efficacy* (the belief that physical activity effectively prevents CVD) and *self-efficacy* (the confidence in one's ability to maintain a physical activity regimen).

Health Belief Model and Protection Motivation Theory

The literature on health behaviors heavily relies on the Health Belief Model (HBM) and Protection Motivation Theory (PMT) to conceptualize how individuals make decisions regarding disease prevention[13].

The HBM posits that health behavior is determined by an individual's desire to avoid illness and the belief that a specific action will successfully prevent it. It evaluates perceived susceptibility, severity, benefits, and barriers[14]. However, PMT provides a more granular framework specifically designed to understand responses to health threats through two distinct cognitive pathways: Threat Appraisal and Coping Appraisal[13].

1. Threat Appraisal: Evaluates the individual's perceived vulnerability to a disease and the perceived severity of that disease, weighed against the intrinsic or extrinsic rewards of maladaptive behaviors (e.g., the comfort of a sedentary lifestyle)[13].

2. Coping Appraisal: Evaluates the individual's perceived *response efficacy* (belief in the effectiveness of the preventative behavior) and *self-efficacy* (confidence in executing the behavior), weighed against the perceived *response costs* (e.g., time, money, effort)[13].

Meta-analyses of PMT components consistently demonstrate that self-efficacy is the strongest predictor of both behavioral intention and actual future behavior, followed by response costs and response efficacy[13]. Consequently, much of the literature evaluating student physical activity focuses on these specific coping variables.

Threat Appraisal: Perceived Vulnerability and Severity Among Students

For a preventative behavior to be initiated under the PMT framework, the individual must first perceive a credible threat[15]. However, the literature indicates a significant disconnect between the actual clinical risk of CVD in young adults and their subjective awareness.

Clinical studies screening college populations reveal alarming rates of overlapping CVD risk factors, including high rates of overweight and obesity, prediabetes, binge drinking, and stage

1 hypertension[2]. Despite this clinical reality, studies assessing student knowledge show substantial gaps. While general awareness that hypertension or smoking causes heart disease is reasonably high, nuanced scientific understanding is poor[1]. For example, a study among non-medical university students found low awareness regarding the protective role of high-density lipoprotein (HDL) cholesterol, the specific impact of dietary fats, and atypical symptoms of myocardial infarction[1].

Furthermore, qualitative and quantitative reviews suggest that students often exhibit an "optimism bias," failing to internalize CVD as a personal or immediate threat[16]. Many students relegate cardiovascular conditions to old age and rely on oversimplified preventive heuristics, such as believing that merely avoiding mental "tension" or stress is sufficient to prevent heart attacks[23]. Because the perceived vulnerability is low, the mathematical product of the threat appraisal is weakened, severely undermining the motivation to engage in long-term physical activity strictly for cardiovascular protection[15].

Evaluating Response Efficacy

Response efficacy evaluates the internal belief that the recommended behavior will successfully mitigate the identified threat[13].

The literature indicates that students generally acknowledge the broad health benefits of physical activity. Studies show that when evaluating preventative attitudes, the majority of students agree that regular exercise is important[20]. However, the specific response efficacy regarding *long-term cardiovascular disease prevention* is often secondary to immediate, tangible benefits.

Research highlights that the primary motivating factors driving students to exercise are not chronic disease prevention, but rather immediate health improvement, stress reduction, revitalization, and aesthetic body modification[6]. For instance, a qualitative evaluation noted that positive attitudes toward physical activity among youth are heavily tied to "being in shape and having fun," whereas long-term clinical prevention is rarely cited as a primary driver[25].

Self-Efficacy and Perceived Response Costs

While response efficacy addresses the *utility* of the behavior, self-efficacy addresses the individual's perceived *capability* to overcome barriers (response costs)[14]. Self-efficacy is consistently identified as a vital predictor of exercise initiation and maintenance[26]. The literature extensively documents the environmental, structural, and psychological response

costs that aggressively erode students' self-efficacy.

Systematic reviews and cross-sectional studies globally, and particularly in South Asia, identify a consistent triad of dominant barriers to physical activity among university students:

Barrier Domain (Response Cost)	Literature Findings and Prevalence
Lack of Time & Academic Pressure	Consistently cited as the primary barrier. Students report that academic demands, prolonged study hours, and scheduling conflicts make it nearly impossible to allocate time for exercise. Studies indicate up to 45% of students view lack of time as a significant contributor to their inactivity[6].
Lack of Energy & Fatigue	The physical and cognitive exhaustion resulting from university life serves as a massive deterrent. Over 50% of inactive students in some cohorts cite being "too tired after work/study" as a primary reason for failing to exercise[12].
Lack of Willpower & Motivation	Internal psychological barriers, often categorized as a lack of willpower, affect a vast majority of sedentary students (up to 63% in some surveys). This reflects a profound deficit in self-efficacy, where students feel fundamentally incapable of initiating or sticking to a routine[12].
Social Influence & Skill Deficits	Social friction, such as having inactive friends or family, normalizes sedentariness (cited by ~30% to 72% of students as an influence). Furthermore, a lack of physical skills or fear of social embarrassment in fitness spaces significantly raises the psychological cost of entry[28].

Socio-Cultural and Gendered Dimensions: Evidence from India and Punjab

The rapid epidemiological transition in India from agrarian lifestyles to industrialized, digitally-centric environments has precipitated a surge in non-communicable diseases and sedentary behaviors[23]. The narrative in the literature regarding Indian youth highlights specific socio-cultural constraints that impact self-efficacy.

A cross-sectional study in the Majha region of Punjab revealed that over 56% of adults fail to meet WHO moderate-to-vigorous physical activity recommendations, a phenomenon strongly correlated with high smartphone screen time (averaging over 86 minutes daily) and urbanization[31]. The increasing influence of digital technology heavily contributes to prolonged sitting, which adversely affects both cardiovascular and mental health[7].

Gender disparities in physical activity self-efficacy are highly pronounced in the literature. Studies assessing university cohorts in India and Pakistan consistently demonstrate that female students face significantly higher internal and external barriers to exercise compared to males[6]. While male students report higher physical activity participation and motivation

driven by enjoyment and competition, female students frequently report higher scores for barriers such as lack of time, lack of energy, and social constraints[6]. Societal norms, spatial marginalization, and a lack of gender-sensitive programming often limit female access to safe recreational spaces, thereby artificially inflating the response costs and suppressing self-efficacy[25].

CONCLUSION

The literature synthesized in this narrative review underscores that while the biological efficacy of physical activity in preventing cardiovascular disease is indisputable, university students face complex socio-cognitive barriers that prevent behavioral adherence. Utilizing the Protection Motivation Theory, it is evident that students often possess a low threat appraisal due to an optimism bias and a lack of specific scientific knowledge regarding cardiovascular pathology. Furthermore, while general response efficacy for exercise is acknowledged, it is often tied to short-term aesthetic or stress-relief goals rather than long-term disease prevention. Most critically, student self-efficacy is heavily compromised by significant response costs, predominantly academic time constraints, fatigue, and environmental limitations. Addressing the epidemic of physical inactivity, particularly in rapidly transitioning regions like India, requires interventions that move beyond simple health education. Strategies must focus on systematically lowering structural response costs, enhancing gender-sensitive built environments, and actively building self-efficacy through socially supportive and accessible physical activity programming.

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