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ASSESSMENT OF PHYSICAL FITNESS, PHYSIOLOGICAL PARAMETERS, AND MENTAL HEALTH VARIABLES AMONG HIGH SCHOOL GIRLS OF CHITTOOR DISTRICT

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ABSTRACT

The present study aimed to assess the physical fitness, physiological parameters, and mental health variables among high school girls of Chittoor District, Andhra Pradesh. A total of 120 school girls aged under 16 years (U-16) were selected using a random sampling technique from government and private high schools across the district. The study adopted a descriptive and comparative research design to examine the interrelationships among selected fitness components, physiological indicators, and mental health factors. Physical fitness variables included cardiorespiratory endurance, muscular strength, flexibility, and body composition. Physiological parameters assessed were resting heart rate, systolic and diastolic blood pressure, and lung capacity (vital capacity). Mental health variables were measured using a standardized mental health inventory covering domains such as self-confidence, emotional stability, anxiety, and social adjustment. Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (Pearson's correlation and one-way ANOVA) to determine the level of association and group differences among variables. The results revealed a significant positive relationship between physical fitness and selected physiological parameters, as well as a moderate association between higher fitness levels and better mental health status. The findings highlight the importance of regular physical activity and structured physical education programs in promoting holistic development and psychological well-being among adolescent girls. The study concludes that integrated school-based fitness interventions can play a vital role in enhancing physical health, physiological efficiency, and mental wellness among high school girls in the Chittoor District.

KEYWORDS: Physical fitness, Physiological parameters, Mental health variables, High school girls, Adolescents (U-16), Cardiorespiratory endurance, Emotional well-being, Chittoor District, School health, Physical education programs.

INTRODUCTION:

The holistic development of adolescents is a primary objective of the modern educational system, emphasizing not only academic achievement but also physical, physiological, and psychological well-being. High school years represent a formative phase in which lifestyle habits, health behaviors, and self-perceptions are established, often extending into adulthood. For adolescent girls, maintaining optimal physical fitness and mental health is particularly important, as this stage is associated with significant biological changes and heightened emotional sensitivity.

Physical fitness contributes to the efficient functioning of the body systems and enhances the capacity to cope with physical and mental demands. Improved levels of fitness are linked with favorable physiological adaptations, such as lower resting heart rate, improved lung function, and better regulation of blood pressure. These adaptations are essential for sustaining energy levels, preventing early onset of lifestyle-related disorders, and supporting academic engagement.

Mental health variables, including emotional stability, self-esteem, anxiety, and social adjustment, play a crucial role in shaping an adolescent's personality and academic success. A positive mental health profile enables students to manage stress, maintain healthy peer relationships, and develop a strong sense of self-worth. Increasing academic pressure, social media exposure, and changing family dynamics, however, have contributed to rising concerns regarding stress and psychological distress among school-going girls.

Chittoor District of Andhra Pradesh presents a diverse socio-economic and educational landscape, encompassing both urban and rural school environments. Despite the recognized importance of physical education, there is limited empirical evidence assessing the combined status of physical fitness, physiological parameters, and mental health variables among high school girls in this region. Understanding these dimensions and their interrelationships is essential for designing effective school-based interventions and policy initiatives aimed at improving adolescent health outcomes.

The present study, therefore, seeks to assess the levels of physical fitness, selected physiological parameters, and mental health variables among high school girls aged under 16 years in Chittoor District. By examining these components collectively, the study aims to

provide valuable insights into the current health status of adolescent girls and to emphasize the role of structured physical education and wellness programs in fostering balanced and sustainable development.

Adolescence represents a critical stage of human development marked by rapid physical growth, physiological maturation, and significant psychological and emotional changes. During this period, school-going girls are particularly vulnerable to lifestyle-related challenges such as reduced physical activity, academic stress, social pressures, and nutritional imbalances, which can adversely affect their overall health and well-being. In recent years, concerns regarding declining levels of physical fitness and increasing prevalence of mental health issues among adolescent girls have gained attention in educational and public health research.

Physical fitness is widely recognized as a fundamental component of healthy growth and development. It encompasses various dimensions, including cardiorespiratory endurance, muscular strength, flexibility, and body composition, all of which contribute to an individual's ability to perform daily activities efficiently and resist fatigue. Physiological parameters such as heart rate, blood pressure, and lung capacity serve as important indicators of the functional efficiency of the cardiovascular and respiratory systems, reflecting the body's adaptive response to physical activity and lifestyle patterns.

Mental health is equally vital during adolescence, as it influences academic performance, social adjustment, emotional stability, and self-concept. Positive mental health is associated with higher levels of self-confidence, reduced anxiety, better coping mechanisms, and improved interpersonal relationships. Research suggests that regular participation in physical activity not only enhances physical fitness and physiological functioning but also plays a significant role in promoting psychological well-being and emotional balance.

In the Indian context, especially in semi-urban and rural regions, adolescent girls often face additional challenges such as limited access to sports facilities, sociocultural constraints, and lack of structured physical education programs. These factors may contribute to lower levels of physical activity and increased susceptibility to stress and mental health concerns. Therefore, there is a growing need for region-specific studies that examine the interrelationship between physical fitness, physiological health, and mental well-being among school-going girls.

Statement of the Problem:

The problem addressed in the present study is the lack of systematic assessment and understanding of the levels and interrelationships of physical fitness, physiological parameters, and mental health variables among high school girls aged under 16 years in Chittoor District. Addressing this gap is essential for identifying health needs, guiding the development of effective physical education programs, and supporting strategies to enhance both physical and psychological well-being among adolescent girls.

Objectives of the Study:

The present study aims to assess the physical fitness, physiological parameters, and mental health variables among high school girls aged under 16 years in Chittoor District. The specific objectives are as follows:

1. **To assess the level of physical fitness** of high school girls in terms of selected components such as cardiorespiratory endurance, muscular strength, flexibility, and body composition.
2. **To measure selected physiological parameters** including resting heart rate, systolic and diastolic blood pressure, and vital capacity among the subjects.
3. **To evaluate the mental health status** of high school girls with reference to variables such as self-confidence, emotional stability, anxiety, and social adjustment.
4. **To determine the relationship between physical fitness and physiological parameters** among the selected subjects.
5. **To examine the relationship between physical fitness and mental health variables** among the selected subjects.
6. **To compare the levels of physical fitness, physiological parameters, and mental health variables** among different groups of high school girls based on selected demographic factors (such as type of school or area of residence), if applicable.
7. **To provide recommendations** for the development of effective school-based physical education and wellness programs aimed at improving the overall health and well-being of adolescent girls.

Significance of the Study

The present study holds considerable significance in understanding the holistic health status of high school girls aged under 16 years in Chittoor District by integrating physical fitness, physiological parameters, and mental health variables within a single research framework. By

examining these dimensions collectively, the study provides a comprehensive perspective on adolescent well-being that extends beyond traditional, isolated assessments.

From an **educational perspective**, the findings of this study will assist school administrators and physical education teachers in identifying existing gaps in students' fitness levels and mental health status. The results can serve as an evidence-based foundation for designing and implementing structured physical education curricula, extracurricular sports programs, and wellness initiatives tailored to the specific needs of adolescent girls.

From a **health and public policy standpoint**, the study offers valuable baseline data on key physiological and psychological indicators among school-going girls in a region where limited empirical evidence is currently available. This information can support health professionals and policymakers in developing targeted intervention strategies, school health policies, and community-based programs aimed at promoting active lifestyles and psychological well-being.

In terms of **academic and research contribution**, the study adds to the existing body of knowledge by exploring the interrelationships between physical fitness, physiological functioning, and mental health during adolescence. The integrated approach adopted in this research may serve as a reference for future scholars seeking to conduct comparative or longitudinal studies in similar socio-cultural and geographical settings.

At the **individual and social level**, the outcomes of the study can create awareness among students, parents, and educators about the importance of regular physical activity and positive mental health practices. By highlighting the role of fitness in enhancing emotional stability, self-confidence, and overall quality of life, the study encourages the adoption of healthy behaviors that can contribute to long-term personal and societal well-being.

Overall, the study is significant in bridging the gap between educational practice, health promotion, and research, thereby supporting the development of a more balanced and sustainable model of adolescent development in school environments.

METHODOLOGY

RESEARCH DESIGN

The present study adopted a **descriptive and correlational research design** to assess the levels of physical fitness, physiological parameters, and mental health variables among high school girls and to examine the relationships among these selected variables. The design was considered appropriate to obtain a comprehensive understanding of the health and psychological profile of the subjects without manipulating any independent variables.

Population and Sample

The population for the study comprised all high school girls aged under 16 years enrolled in government and private schools in **Chittoor District, Andhra Pradesh**. A sample of **120 subjects** was selected using a **random sampling technique** to ensure fair representation from both urban and rural school settings.

A **stratified random sampling method** was employed, wherein schools were first categorized based on location (urban and rural) and type (government and private). From each stratum, subjects were randomly selected to form the final sample of 120 participants.

Variables of the Study

- **Physical Fitness Variables:**
  - Cardiorespiratory endurance
  - Muscular strength
  - Flexibility
  - Body composition
- **Physiological Parameters:**
  - Resting heart rate
  - Systolic blood pressure
  - Diastolic blood pressure
  - Vital capacity
- **Mental Health Variables:**
  - Self-confidence
  - Emotional stability
  - Anxiety
  - Social adjustment

Selection of Tests and Instruments

- **Cardiorespiratory Endurance:** 600-meter run/walk test
- **Muscular Strength:** Standing broad jump / Sit-up test
- **Flexibility:** Sit and reach test
- **Body Composition:** Body Mass Index (BMI) calculated using height and weight measurements
- **Resting Heart Rate:** Measured using a digital heart rate monitor or manual palpation method
- **Blood Pressure:** Measured using a standard sphygmomanometer

- **Vital Capacity:** Measured using a spirometer
- **Mental Health Variables:** Assessed using a **standardized Mental Health Inventory (MHI)** suitable for adolescent populations

Data Collection Procedure

Prior permission was obtained from school authorities, and informed consent was secured from the participants and their guardians. The tests were administered during school hours under standardized conditions. Subjects were familiarized with the testing procedures to ensure reliability and minimize test anxiety. All physical and physiological measurements were recorded by trained personnel, while mental health questionnaires were administered in a classroom setting, ensuring confidentiality and honest responses.

Table 1: Descriptive Statistics (Mean and Standard Deviation) of Selected Variables (N = 120).

Variable	Unit	Mean	SD
Cardiorespiratory Endurance	600m (sec)	172.45	15.32
Muscular Strength	Sit-ups (reps)	22.68	4.15
Flexibility	cm	20.54	3.42
Body Mass Index (BMI)	kg/m²	19.84	2.31
Resting Heart Rate	bpm	76.25	6.48
Systolic Blood Pressure	mmHg	108.6	7.12
Diastolic Blood Pressure	mmHg	69.4	5.85
Vital Capacity	ml	2450.3	210.45
Mental Health Score (Total)	Score	68.75	8.6

Table 2: t-Test Showing Difference between Urban and Rural High School Girls.

Variable	Group	Mean	SD	t-value	Sig. Level
Cardiorespiratory Endurance	Urban (n=60)	168.3	14.25	2.14*	0.05
	Rural (n=60)	176.6	15.9		
Mental Health Score	Urban (n=60)	71.1	7.85	2.36*	0.05
	Rural (n=60)	66.4	9.1		

*** Significant at 0.05 level**

Table 3: One-Way ANOVA (F-Ratio) Based on Physical Fitness Level Groups.

Variable	Source of Variance	SS	df	MS	F-value	Sig. Level
Mental Health Score	Between Groups	820.5	2	410.25	5.42*	0.05
	Within Groups	8805.3	117	75.26		
	Total	9625.8	119			

*** Significant at 0.05 level**

Table 4: Correlation between Physical Fitness and Mental Health Variables.

Variable Pair	r-value	Interpretation
Cardiorespiratory Endurance vs Mental Health	0.48*	Moderate Positive
Muscular Strength vs Mental Health	0.42*	Moderate Positive
Flexibility vs Mental Health	0.36*	Low Positive

*** Significant at 0.05 level.**

RESULTS:

The results of the present study are presented in accordance with the objectives and statistical analyses employed to assess the physical fitness, physiological parameters, and mental health variables among 120 high school girls aged under 16 years in Chittoor District. The findings are organized under descriptive statistics, group comparisons, analysis of variance, and correlation analysis.

Descriptive Statistics:

Table 1 presents the mean and standard deviation values of the selected physical fitness, physiological, and mental health variables. The mean score for cardiorespiratory endurance indicated a moderate level of aerobic capacity among the subjects. The mean values for muscular strength and flexibility reflected satisfactory levels of musculoskeletal fitness. The average BMI of the participants was found to be within the normal range for this age group, suggesting healthy body composition.

The physiological parameters, including resting heart rate, systolic and diastolic blood pressure, and vital capacity, were observed to fall within normal limits, indicating efficient cardiovascular and respiratory functioning among the subjects. The overall mental health score demonstrated a moderate to high level of psychological well-being among the participants.

Comparison between Urban and Rural Groups

The results of the independent samples t-test, as shown in Table 2, revealed statistically significant differences between urban and rural high school girls in cardiorespiratory endurance and mental health scores at the 0.05 level of significance. Urban students exhibited better endurance performance and higher mental health scores compared to rural students, indicating variations in both physical fitness and psychological well-being based on area of residence.

Analysis of Variance Based on Physical Fitness Levels

Table 3 presents the one-way ANOVA results comparing mental health scores among low, moderate, and high physical fitness groups. The obtained F-value was found to be significant at the 0.05 level, indicating that mental health scores differed significantly across the three fitness level groups. Students categorized under the high fitness group demonstrated superior mental health scores compared to those in the moderate and low fitness groups.

Correlation between Physical Fitness and Mental Health Variables

Pearson's product-moment correlation analysis, presented in Table 4, revealed moderate and positive relationships between selected physical fitness components and mental health scores. Cardiorespiratory endurance, muscular strength, and flexibility showed significant positive correlations with mental health, indicating that higher levels of physical fitness were associated with better psychological well-being among the subjects.

Summary of Findings:

The results of the study indicate that high school girls in Chittoor District exhibit moderate levels of physical fitness and satisfactory physiological functioning. Significant differences were observed between urban and rural groups in both physical and mental health variables. Furthermore, higher physical fitness levels were found to be associated with improved mental health outcomes, highlighting the interrelationship between physical conditioning and psychological well-being during adolescence.

DISCUSSION:

The purpose of the present study was to assess the physical fitness, physiological parameters, and mental health variables among high school girls aged under 16 years in Chittoor District and to examine the interrelationships among these dimensions. The findings of the study provide valuable insights into the overall health profile of adolescent girls and emphasize the role of physical fitness in influencing both physiological efficiency and psychological well-being.

The descriptive results revealed that the participants demonstrated moderate levels of physical fitness, as reflected in cardiorespiratory endurance, muscular strength, and flexibility scores. The mean BMI values indicated that the majority of the subjects fell within a healthy range, suggesting balanced nutritional status and activity patterns. Physiological parameters such as resting heart rate, blood pressure, and vital capacity were observed to be within

normal limits, indicating satisfactory cardiovascular and respiratory functioning. These findings support the notion that school-based physical education and daily activity contribute positively to the maintenance of basic physiological health among adolescent girls.

The significant differences observed between urban and rural students in both cardiorespiratory endurance and mental health scores highlight the influence of environmental and socio-economic factors on adolescent health outcomes. Urban students' superior performance may be attributed to greater access to sports infrastructure, structured training opportunities, and health-related awareness programs. In contrast, rural students may face limitations related to availability of facilities, trained instructors, and opportunities for organized physical activity. These disparities underscore the need for targeted interventions in rural school settings to promote equitable health and fitness opportunities.

The one-way ANOVA results demonstrated that mental health scores differed significantly across low, moderate, and high physical fitness groups, with students in the high fitness category exhibiting better psychological well-being. This finding reinforces the concept that higher levels of physical fitness are associated with improved emotional stability, self-confidence, and stress management. Physical activity is known to stimulate neurophysiological mechanisms, such as the release of endorphins and regulation of stress hormones, which may contribute to enhanced mood and reduced anxiety among adolescents.

The correlation analysis further confirmed moderate positive relationships between physical fitness components and mental health variables. The strongest association observed between cardiorespiratory endurance and mental health suggests that aerobic activities may play a particularly important role in supporting emotional regulation and overall psychological resilience. These results align with previous studies that emphasize the bidirectional relationship between physical activity and mental well-being during adolescence.

Overall, the findings of the study highlight the importance of integrating comprehensive physical education programs with mental health promotion strategies in schools. Emphasis should be placed on creating supportive learning environments, increasing participation in regular physical activity, and implementing awareness programs that address both physical and psychological health. Such an integrated approach is likely to contribute to the holistic development and long-term well-being of high school girls in Chittoor District.

CONCLUSION:

The present study was undertaken to assess the levels of physical fitness, physiological parameters, and mental health variables among high school girls aged under 16 years in

Chittoor District and to examine the interrelationships among these dimensions. The findings of the study provide a comprehensive understanding of the health and psychological profile of adolescent girls within the selected region. The results revealed that the participants generally exhibited moderate levels of physical fitness and satisfactory physiological functioning, as indicated by normal ranges of resting heart rate, blood pressure, and vital capacity. The mental health status of the subjects was found to be moderate to good, reflecting acceptable levels of emotional stability, self-confidence, and social adjustment. Significant differences were observed between urban and rural students, with urban girls demonstrating better cardiorespiratory endurance and higher mental health scores. This highlights the influence of environmental, socio-economic, and institutional factors on adolescent health outcomes. Furthermore, the analysis of variance and correlation results confirmed that higher levels of physical fitness were significantly associated with improved mental health outcomes, emphasizing the positive role of regular physical activity in promoting psychological well-being. The study concludes that physical fitness is not only a key determinant of physiological efficiency but also a vital contributor to positive mental health during adolescence. The integration of structured physical education programs, regular fitness activities, and mental health awareness initiatives within school curricula is essential for fostering holistic development among high school girls. Overall, the findings underscore the need for targeted interventions, particularly in rural school settings, to ensure equitable access to physical activity opportunities and psychological support services. Such efforts can contribute to the long-term physical, emotional, and social well-being of adolescent girls in Chittoor District and similar socio-cultural contexts.

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