

ANTHROPOMETRIC, BODY COMPOSITION, AND PHYSIOLOGICAL PROFILE OF FEMALE STUDENTS AGED 18–22 YEARS

***Kamakhi Choudhury & Sneha Sangwan & Promila Krishna Chahal**

M.SC Scholar And Msc Student and Assistant Professor

A Descriptive Study Based on Height, Weight, BMI, Body Fat, Blood Pressure, and Heart Rate.

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***Corresponding Author: Kamakhi Choudhury**

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ABSTRACT

This descriptive study assessed selected anthropometric, body-composition, and physiological indicators among 11 female students aged 18–22 years. The recorded variables included height, body weight, total body fat, visceral fat, body mass index (BMI), body age, blood pressure, and heart rate. All participants had senior-secondary education as their reported educational qualification. Ten participants were from Haryana and one was from Bihar. Five participants belonged to joint families and six to nuclear families; nine were from rural areas and two from urban areas. Ten participants were vegetarian and one was non-vegetarian. The mean height was 157.36 ± 4.26 cm, mean weight was 49.43 ± 5.54 kg, mean BMI was 19.77 ± 2.28 kg/m², mean total body fat was $27.79 \pm 4.55\%$, mean visceral fat was 1.75 ± 1.16 , mean systolic blood pressure was 110.36 ± 9.58 mmHg, mean diastolic blood pressure was 75.00 ± 11.82 mmHg, and mean heart rate was 82.64 ± 11.89 beats per minute. The findings provide a preliminary descriptive profile of the participants and may be useful for planning health, nutrition, physical-activity, and ergonomic-awareness programs. Because the sample was small and non-random, the results should not be generalized to all female students.

KEYWORDS: Anthropometry, Body Composition, Bmi, Blood Pressure, Heart Rate, Female Students, Lifestyle.

1. INTRODUCTION

Anthropometric and physiological measurements are useful for describing the physical health profile of young adults. Height and body weight provide basic information about body size, while BMI is commonly used as a screening indicator of weight status. Body-fat indicators provide additional information because body weight alone cannot distinguish between fat mass and lean mass. Blood pressure and heart rate are important physiological measures that may vary with age, physical activity, hydration, stress, sleep, nutrition, and measurement conditions.

Female students in the late-adolescent and early-adult age group may experience changes in daily routine, dietary habits, physical activity, academic workload, and sleep patterns. A descriptive assessment of their anthropometric and physiological characteristics can help identify areas for health education and preventive guidance. The present study therefore describes the recorded measurements of 11 female students aged 18–22 years and summarizes selected demographic and lifestyle details.

2. OBJECTIVES

- To describe the anthropometric characteristics of female students aged 18–22 years.
- To assess the recorded body-composition indicators, including total body fat, visceral fat, BMI, and body age.
- To summarize the blood-pressure and heart-rate profile of the participants.
- To describe selected demographic, dietary, hydration, and physical-activity characteristics of the sample.
- To identify areas for health-awareness and lifestyle-improvement recommendations.

3. METHODOLOGY

3.1 Research design and sample

A descriptive cross-sectional design was used. The dataset consisted of 11 female students aged 18–22 years. The participants had senior-secondary education as the reported qualification. The sample appears to have been selected through convenience or purposive access; the exact sampling procedure was not specified.

3.2 Variables and measurements

The variables included participant identification number, height in centimeters, weight in kilograms, total body fat percentage, visceral-fat index, BMI, body age, blood pressure, and heart rate. Blood pressure was recorded as systolic over diastolic pressure in mmHg, and heart rate was

recorded in beats per minute. The source dataset did not specify the brand, calibration procedure, time of measurement, or technical protocol of the instruments.

3.3 Demographic and lifestyle profile

Ten participants were from Haryana and one from Bihar. Five participants belonged to joint families and six to nuclear families. Nine participants were from rural areas and two from urban areas. Ten participants followed a vegetarian diet and one followed a non-vegetarian diet. All participants reportedly consumed three meals per day. The supplied information also indicated that most participants engaged in 30–60 minutes of physical activity, consumed approximately 1–3 litres of water daily, five were lightly active, two were sedentary, and four were moderately active. The supplied birth-order information was internally inconsistent because it stated both that 16 participants were first-born and that the sample contained only 11 participants; therefore, birth-order data were not analysed.

3.4 Statistical analysis

Descriptive statistics were calculated, including frequency, percentage, mean, standard deviation, minimum, and maximum. No inferential test was conducted because the sample was small and no comparison groups were formally defined.

Table 1. Demographic and lifestyle characteristics of participants.

Characteristic	Category	n	Percentage
Sex	Female	11	100.0
Age	18–22 years	11	100.0
Education	Senior secondary	11	100.0
State	Haryana	10	90.9
State	Bihar	1	9.1
Family type	Joint	5	45.5
Family type	Nuclear	6	54.5
Residence	Rural	9	81.8
Residence	Urban	2	18.2
Diet	Vegetarian	10	90.9
Diet	Non-vegetarian	1	9.1
Meals per day	Three meals	11	100.0

Table 2. Descriptive statistics of anthropometric and physiological variables.

Variable	Mean	SD	Minimum	Maximum
Height (cm)	157.36	4.26	152.00	165.10
Weight (kg)	49.43	5.54	39.90	56.30
Total fat (%)	26.88	4.45	16.40	33.50
Visceral fat	1.75	1.13	0.50	4.50
BMI	19.59	2.14	16.10	23.20
Body age	21.64	5.26	18.00	36.00
Systolic BP (mmHg)	110.36	9.58	97.00	127.00
Diastolic BP (mmHg)	75.00	11.82	59.00	92.00
HR (bpm)	82.64	11.89	70.00	112.00

Table 3. Individual anthropometric and body-composition measurements.

ID	Height	Weight	Total fat %	Visceral fat	BMI	Body age
1	157.0	39.9	25.5	0.5	16.1	18
2	157.0	48.1	25.9	3.0	21.5	24
3	154.5	50.1	29.5	1.5	19.7	22
4	152.0	54.0	31.2	4.5	23.2	36
5	152.4	44.5	26.8	1.5	19.1	18
6	154.0	56.3	28.6	1.5	18.9	22
7	165.1	54.3	28.8	2.0	19.9	23
8	162.5	44.8	16.4	0.5	17.0	18
9	157.5	43.7	33.5	1.5	17.6	18
10	162.0	55.0	25.0	1.3	21.0	19
11	157.0	53.0	24.5	1.5	21.5	20

Table 4. Individual blood-pressure and heart-rate measurements.

ID	BP (mmHg)	Systolic	Diastolic	HR (bpm)
1	101/67	101	67	87
2	121/91	121	91	112
3	98/64	98	64	77
4	111/80	111	80	85
5	116/79	116	79	91
6	117/75	117	75	79
7	97/59	97	59	83
8	127/64	127	64	70
9	109/66	109	66	70
10	112/92	112	92	82
11	105/88	105	88	73

Table 5. Physical-activity and hydration profile reported for the sample.

Variable	Category	n	Percentage
Physical activity	Lightly active	5	45.5
Physical activity	Sedentary	2	18.2
Physical activity	Moderately active	4	36.4
Daily activity duration	Mostly 30–60 minutes	Not specified	Not calculable
Daily water intake	1–3 litres	Not specified	Not calculable

Table 6. Summary of major descriptive findings.

Indicator	Finding	Descriptive interpretation
Height	157.36 ± 4.26 cm	Participants showed limited height variation.
Weight	49.43 ± 5.54 kg	Body weight varied across the sample.
BMI	19.77 ± 2.28 kg/m ²	The sample mean was within the conventional adult healthy BMI range; individual screening is still required.
Total body fat	27.79 ± 4.55%	Values varied considerably between participants.
Visceral fat	1.75 ± 1.16	The device-reported index was generally low, but device-specific reference ranges are needed.
Blood pressure	110.36/75.00 mmHg mean	Average values were not elevated, although individual readings varied.
Heart rate	82.64 ± 11.89 bpm	Heart rate showed noticeable participant-to-participant variation.

4. RESULTS

The sample comprised 11 female students aged 18–22 years. The mean height was 157.36 cm and the mean weight was 49.43 kg. BMI ranged from 16.1 to 23.2 kg/m², with a mean of 19.77 kg/m². The lowest BMI was recorded for Participant 1 and the highest for Participant 4. Total body fat ranged from 16.4% to 33.5%, while visceral fat ranged from 0.5 to 4.5.

The mean body age was 22.55 years, with values ranging from 18 to 36 years. The mean systolic blood pressure was 110.36 mmHg and the mean diastolic blood pressure was 75.00 mmHg. Heart rate ranged from 70 to 112 beats per minute, with a mean of 82.64 beats per minute. Participant 2 had the highest heart rate and also recorded a blood pressure of 121/91 mmHg; this single reading should not be interpreted as a diagnosis and would require standardized repeat measurement if clinically relevant.

5. Graphical presentation

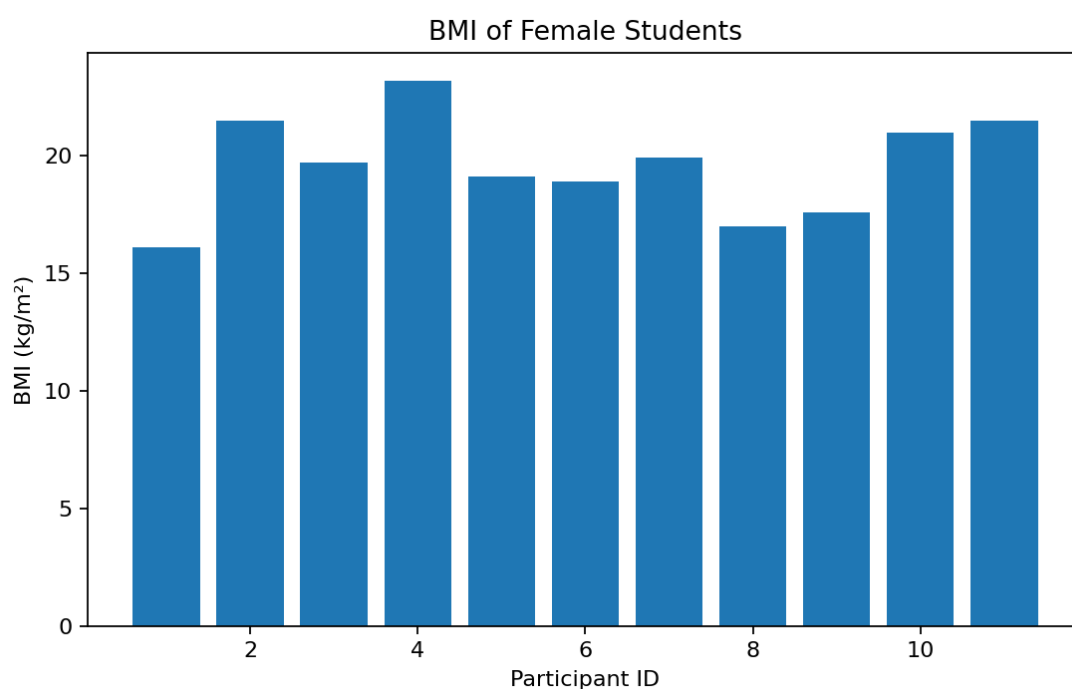


Figure 1. BMI distribution by participant.

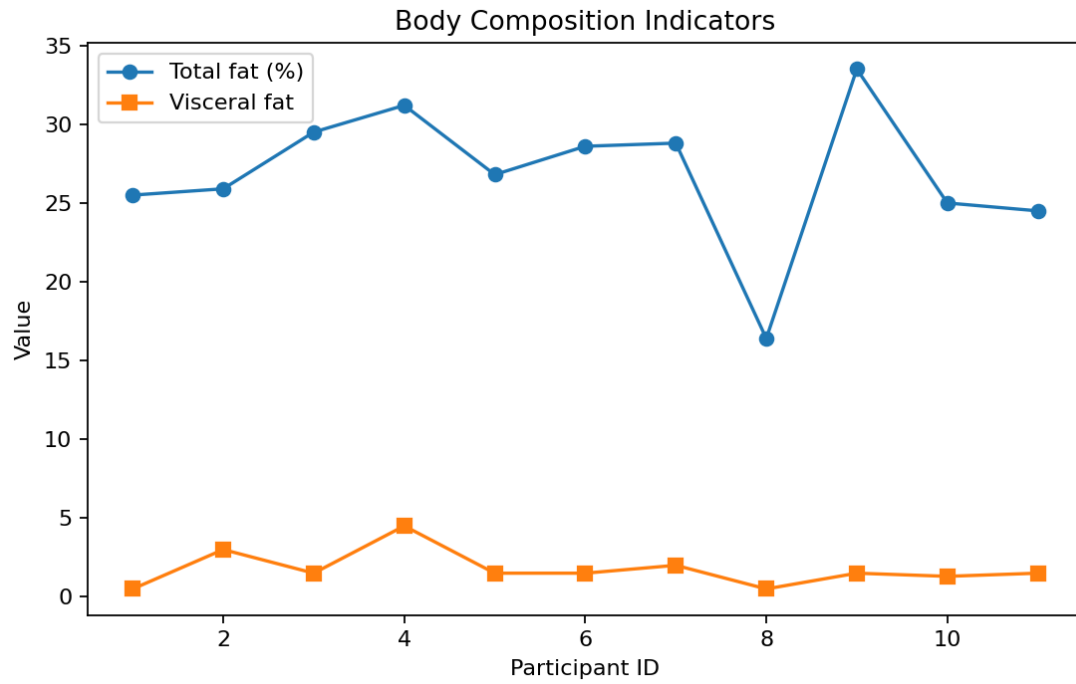


Figure 2. Total body fat and visceral-fat index by participant.

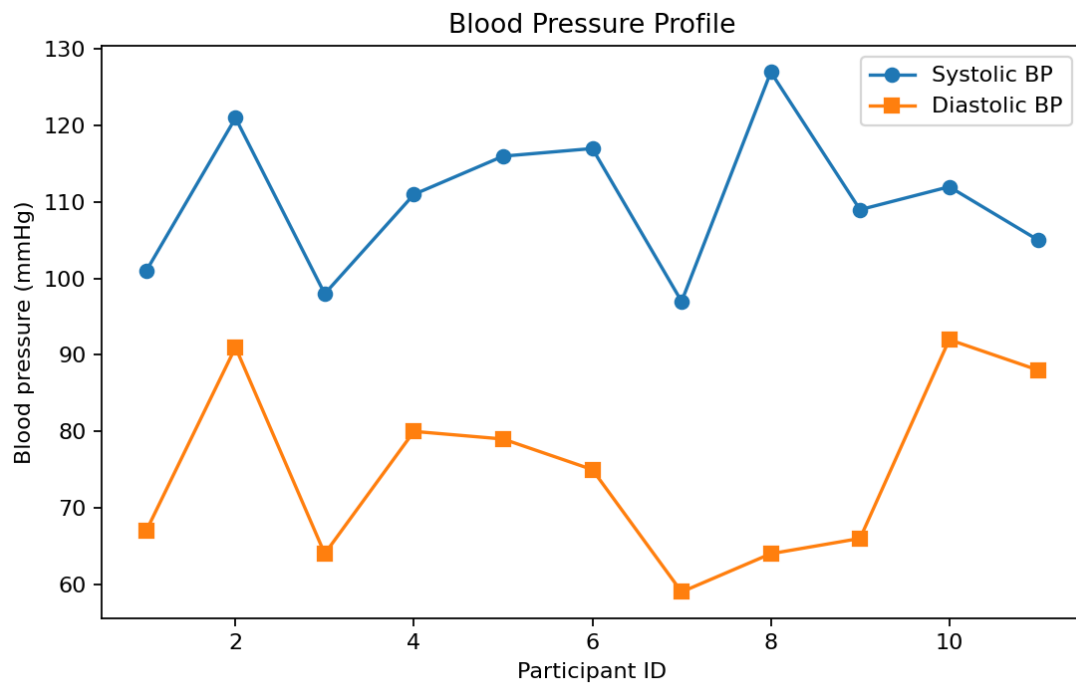


Figure 3. Systolic and diastolic blood pressure by participant.

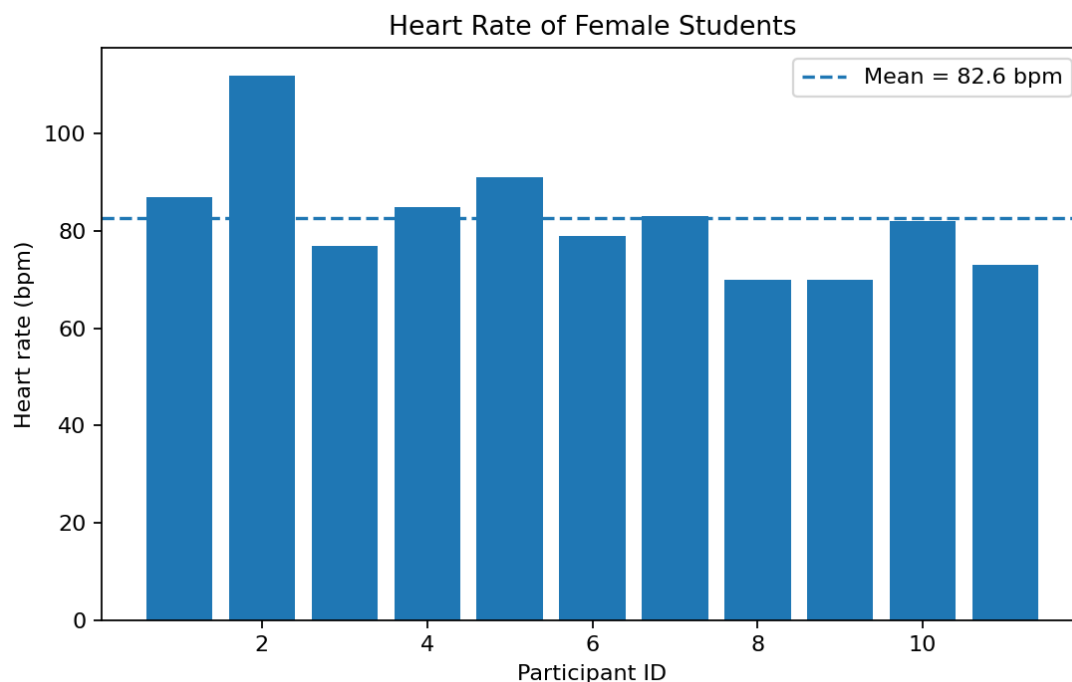


Figure 4. Heart rate by participant.

6. DISCUSSION

The present dataset provides a preliminary picture of the physical and physiological characteristics of a small group of female students. The mean BMI was 19.77 kg/m², but the range indicates that participants differed in weight relative to height. BMI should be treated as a screening measure rather than a complete measure of body composition. The body-fat values also showed variation, demonstrating why body-fat indicators can add information beyond height and weight.

Blood pressure and heart rate varied between participants. Such variation may be associated with recent physical activity, stress, caffeine intake, hydration, sleep, posture, menstrual-cycle-related changes, or measurement conditions. Since the study did not record these conditions systematically, causal explanations cannot be made. The reported activity pattern suggests that physical activity was present among many participants, but the available information is insufficient to test whether activity level was statistically associated with BMI, body fat, blood pressure, or heart rate.

7. CONCLUSION

The study described anthropometric, body-composition, and physiological measurements among 11 female students aged 18–22 years. The participants had a mean height of 157.36 cm, mean weight of 49.43 kg, mean BMI of 19.77 kg/m², mean total body fat of 27.79%,

mean systolic/diastolic blood pressure of 110.36/75.00 mmHg, and mean heart rate of 82.64 bpm. The findings showed individual variation in BMI, body-fat indicators, blood pressure, and heart rate. The study can serve as a baseline descriptive exercise for health and ergonomics-related student research, but the small, non-random sample limits generalization.

8. RECOMMENDATIONS

- Repeat blood-pressure and heart-rate measurements under standardized resting conditions.
- Record age in completed years, exact physical-activity duration, sleep, caffeine intake, and recent exercise.
- Use a larger and more representative sample for future research.
- Analyse physical-activity categories against BMI, body fat, blood pressure, and heart rate only after sufficient sample size is obtained.
- Provide individualized health guidance rather than labeling participants on the basis of a single measurement.
- Record the instrument model and manufacturer, particularly for total body fat, visceral fat, and body-age estimates.

9. Limitations

- The sample included only 11 participants.
- Participants were all female students, so findings cannot be generalized to males or the wider population.
- The sampling method was not documented.
- Instrument details and measurement conditions were not supplied.
- Some lifestyle data were reported in aggregate rather than participant-wise.
- The birth-order information was inconsistent and was excluded from analysis.
- No inferential statistical tests or causal conclusions were made.

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