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PREDICTION OF GENERAL HEALTH RISK WITH ANTHROPOMETRIC STUDIES

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Abstract:

Purpose: The present project focused on comparing two anthropometric indices to predict health risks in a non-invasive comfortable and cost-effective manner for data collection from adult aged participants. Methodology: The data collected by measuring the height with stadiometer and weight by Tata 1mg weighing machine. The data plotted with known variables height and weight by body surface area (BSA) calculation. With the obtained (BSA) value from its equation further health risks estimated correlating with the normal values and compared with body mass index (BMI) calculation. Results & discussion: the overall data of 112 participants revealed 28.57% by BMI and 25% by BSA were at health risk. Conclusion: This overall simple assessments clearly state one's health status can be monitored with BMI and or BSA giving almost closer approximate results predicting health risk and further lab diagnosis is essential for confirming the disease status with medical care and support for leading quality of life free from health complications.

Keywords: *Health risk, anthropometric tests, Body mass Index, Body surface area.*

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INTRODUCTION:

Health as one of the important quality of life, many realize and regret for taking care from initial stage of the very complicated diseases faced by themselves or family ones. Body mass index (BMI) used to predict the health risk falling into obese or overweight measuring individual's height and weight[1-7]. The results are predicted for diseases at risk such as hypertension, type II diabetes and other chronic conditions[8-13]. It has limitations predicting health risk in athletes, gender, races and ages[14].

Body surface area (BSA) measurement is also well-known anthropometric model used to predict the health risks and also used as a measure to decide the medication[15].

These are successfully used to predict the diseases such as diabetes, cardiovascular conditions and in determining its dosage medications to avoid adverse effects as in prescription compulsory the patient's weight, age and sex are recorded for assessing the disease condition and prescribing dose. Our current project is aimed at learning the important anthropometric tests put forth by scientists to predict the health risk by collecting the real time values from the participants and calculating them in two different simple yet clear anthropometric tests and comparing its results.

Methodology: The project involved collecting data from all the participants aged between 18-57 given a coded ID to avoid bias and meticulously documenting the height standing bare foot on ground using stadiometer against the wall in values feet and inches and weight in kg using digital Tata 1mg weighing machine. The data obtained were substituted in the BSA & BMI formula and calculated individual participants with formulae as below

1.Body surface area

BSA= √weight x height/3600

Weight (kg)

Height (cm)

BSA (m^2) –**Mostellar formula**

BSA range values are

Average men BSA= 1.9m^2

Average female BSA=1.6m^2

2. Body metabolic index

BMI= weight/height

BMI range values

a. Underweight= <18.5

b. Normal= 18.5-24.9

c. Overweight=25-29.9

d. Obese=>30

based on individual calculation separately BMI and BSA are calculated and final values interpreted as healthy and unhealthy.

RESULTS AND DISCUSSION:

All adult participants both male and female individually measured calculated the BMI and BSA values were tabulated in the given table no.1 with the health risk .

Table no.1 Individual participant measures for predicting health risk by BMI and BSA.

S.NO	Participant	Sex	BSA	BMI	Health risk
1.	CBCP0101	F	1.54	21.1	H
2.	CBCP0102	F	1.54	26.7	H
3.	CBCP0103	M	1.69	24.2	H
4.	CBCP0104	F	1.38	15.6	H
5.	CBCP0105	F	1.28	15.5	H
6.	CBCP0106	F	1.38	17.4	H
7.	CBCP0107	M	1.74	24.6	H
8.	CBCP0108	M	1.74	26.5	H
9.	CBCP0109	F	1.31	16.8	H
10.	CBCP0110	F	1.31	17.2	H
11.	CBCP0111	F	1.33	16.1	H
12.	CBCP0112	M	1.46	16.5	H
13.	CBCP0113	M	1.49	19.0	H
14.	CBCP0114	M	1.39	15.9	H
15.	CBCP0115	F	1.39	17.4	H
16.	CBCP0116	F	1.39	18.8	H
17.	CBCP0117	F	1.39	19.4	H
18.	CBCP0118	M	1.49	18.3	H
19.	CBCP0119	F	1.65	21.3	NH
20.	CBCP0120	F	1.69	20.1	NH
21.	CBCP0121	F	1.46	17.0	H
22.	CBCP0122	F	1.29	15.5	H
23.	CBCP0123	M	1.87	31.8	H
24.	CBCP0201	M	1.50	1.50	H

25.	CBCP0202	F	1.45	1.46	H
26.	CBCP0203	F	1.52	1.51	H
27.	CBCP0204	F	1.45	1.45	H
28.	CBCP0205	M	1.46	1.46	H
29.	CBCP0206	F	1.36	1.36	H
30.	CBCP0207	F	1.45	1.47	H
31.	CBCP0208	M	1.85	1.89	H
32.	CBCP0209	M	1.86	1.92	H
33.	CBCP0210	M	1.86	1.92	H
34.	CBCP0211	F	1.76	1.79	NH
35.	CBCP0212	M	2.00	2.04	NH
36.	CBCP0301	M	1.69	20.1	H
37.	CBCP0302	M	1.49	18.2	H
38.	CBCP0303	M	1.55	21.5	H
39.	CBCP0304	M	1.69	22.0	H
40.	CBCP0305	M	1.66	26.6	H
41.	CBCP0306	M	1.49	21.7	H
42.	CBCP0307	M	1.6	22.7	H
43.	CBCP0308	M	1.8	22.8	H
44.	CBCP0309	M	1.73	19.5	H
45.	CBCP0310	M	1.8	18.5	H
46.	CBCP0311	M	1.86	27.1	H
47.	CBCP0312	M	1.39	19.4	H
48.	CBCP0313	M	1.71	28.3	H
49.	CBCP0314	M	1.83	31.2	H
50.	CBCP0315	M	1.64	22.7	H
51.	CBCP0316	M	1.73	23.0	H
52.	CBCP0317	M	1.63	21.3	H
53.	CBCP0318	M	1.69	22.0	H
54.	CBCP0319	M	1.7	26.6	H
55.	CBCP0320	M	1.8	32.5	H
56.	CBCP0321	M	1.57	23.5	H
57.	CBCP0322	M	1.64	19.4	H
58.	CBCP0401	F	1.69	30.1	NH
59.	CBCP0402	F	1.26	19.3	H
60.	CBCP0403	F	1.46	25.3	H
61.	CBCP0404	F	1.63	32.9	NH
62.	CBCP0405	F	1.25	14.6	H
63.	CBCP0406	M	1.71	20.2	H
64.	CBCP0407	F	1.59	22.7	H
65.	CBCP0408	F	1.14	14.8	H
66.	CBCP0409	F	1.31	16.3	H
67.	CBCP0410	F	1.3	20.8	H
68.	CBCP0411	F	1.67	22.0	NH
69.	CBCP0412	F	1.82	23.5	NH
70.	CBCP0413	F	1.32	16.3	H
71.	CBCP0414	F	1.46	20.8	H
72.	CBCP0501	M	1.74	25.2	H
73.	CBCP0502	M	1.93	29.9	NH
74.	CBCP0503	F	1.34	17.2	H
75.	CBCP0504	F	1.47	18.7	H
76.	CBCP0505	F	1.34	22.2	H
77.	CBCP0506	F	1.38	18.8	H
78.	CBCP0507	F	1.51	23.5	H
79.	CBCP0508	M	1.46	20.8	H
80.	CBCP0509	M	1.74	23.5	H
81.	CBCP0510	F	1.74	23.5	NH

82.	CBCP0511	F	1.81	19.5	NH
83.	CBCP0512	F	1.48	23.0	H
84.	CBCP0513	M	1.56	16.0	H
85.	CBCP0514	M	1.46	20.3	H
86.	CBCP0515	M	1.63	19.7	H
87.	CBCP0516	M	1.65	19.5	H
88.	CBCP0517	F	1.72	20.2	NH
89.	CBCP0518	F	1.81	24.2	NH
90.	CBCP0519	F	1.41	27.3	H
91.	CBCP0520	F	1.49	19.2	H
92.	CBCP0521	F	1.72	20.6	NH
93.	CBCP0522	M	1.72	23.1	H
94.	CBCP0601	F	1.71	22.4	NH
95.	CBCP0602	M	1.83	26.3	H
96.	CBCP0603	M	2.05	32.1	NH
97.	CBCP0604	F	1.80	30.5	NH
98.	CBCP0605	F	1.65	25.0	NH
99.	CBCP0606	F	1.42	20.7	H
100.	CBCP0607	F	1.66	25.4	NH
101.	CBCP0608	F	1.85	28.2	NH
102.	CBCP0609	F	1.68	31.0	NH
103.	CBCP0610	F	1.59	26.6	H
104.	CBCP0611	F	1.33	23.2	H
105.	CBCP0612	M	1.86	23.8	H
106.	CBCP0613	F	1.70	33.4	NH
107.	CBCP0614	F	1.72	23.8	NH
108.	CBCP0701	F	1.59	24.2	H
109.	CBCP0702	M	1.75	22.5	H
110.	CBCP0703	M	1.72	22.0	H
111.	CBCP0704	M	1.85	30.3	H
112.	CBCP0705	M	1.96	26.7	NH

M/F-male/female; H-healthy; NH-not healthy; BSA-body surface area; BMI-body metabolic index.

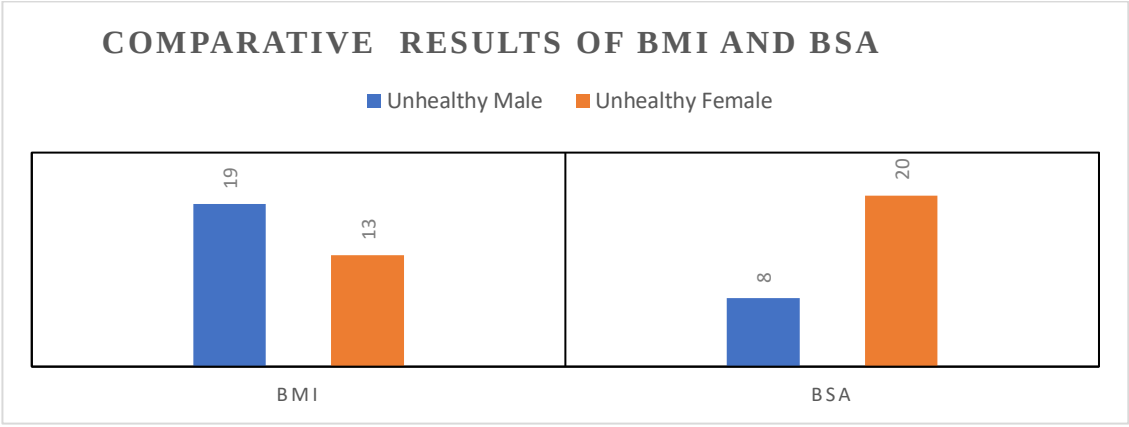

Figure no.1 Comparative health risk results of BMI and BSA

From the above figure no.1 comparative health risk assessment in 112 participants revealed that in BMI males found to be unhealthy compared to females and in BSA assessment the results ae quite opposite for the same participants with BSA where female found to be unhealthy compared to male in this anthropometric tests. But the overall assessment percentage of unhealthy participants found to be 28.5% with BMI and 25% with BSA with closer results.

CONCLUSION:

with the assessment models, it may be evident that further lab reports for confirming with BMI and BSA results are required to seek the medical support and take necessary care to avoid health complications. however, monitoring with these non-invasive, simple cost effective and instant assessment tools can be performed by any individual requiring no medical intervention skills to monitor their health risk.

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