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Assessment of women health status by using anthropometry

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Abstract
Health status is a holistic concept that is determined by more than the presence or absence of any disease. It is often summarised by life expectancy or self-assessed health status, and more broadly includes measures of functioning, physical illness, and mental wellbeing A study was conducted to determine the differences of anthropometrics data among four different age groups in Yattingudda village. Measurements were collected among eighty respondents representing twenty females from each age group from more than twenty. A total of twenty-three body dimensions were measured. Analyse the body mass index (BMI) and aerobic capacity (Vo2 max) as an indicator of health status and also analyse the waist hip ratio (WHR) as an indicator of abdominal obesity. We applied a correlation analysis to define correlation between body mass index and waist hip ratio. The result indicates that correlation between body mass index and waist hip ratio is significant at the 0.01 level.

Keywords: Women, health status, anthropometry, body mass index, aerobic capacity, waist hip ratio

Introduction
Health status is a holistic concept that is determined by more than the presence or absence of any disease. It is often summarised by life expectancy or self-assessed health status, and more broadly includes measures of functioning, physical illness, and mental wellbeing. Nutrition is a major determinant of health, and the resolution of many nutritional issues of public health concern requires survey data. Health is defined "a state of complete physical, mental and social wellbeing, not merely an absence of disease on infirmity" (WHO). This statement has been amplified to include the ability to lead a "socially and economically productive life." Health cannot be measured in exact measurable forms. To assess the health status by using anthropometric data.

Anthropometry is widely used tool to estimate the nutritional status of populations and to monitor the health of the individuals. Anthropometry is the study of the measurements of the human body in terms of the dimensions of the bone, muscle and adipose tissue. (Gorstein *et al.*, 1994) [1] The word "Anthropometry" is derived from the Greek word 'anthropo' meaning human and 'metron' meaning measure. Anthropometry is the science of measurement and the art of application that establishes the physical geometry, mass properties and strength capabilities of human body (Leilanie and Prado, 2007) [5].

It is concerned with physical features and functions of body including linear dimensions, weight, volume, range of movements etc. It is concerned with measuring human traits such size, mobility and strength. The most three frequently used anthropometric indices are weight for height, height for age and weight for age.

Methodology
The purpose of this paper is assessment of women health status by using anthropometry to create a thought of what influence an anthropometry can have on health status of an individual. Dharwad district Yattingudda village was selected purposively as a study area. The women of different age group and occupation formed the sample for study. The sample size was 80. In this paper tries to analysis the body mass index, waist hip ratio and Aerobic capacity with given reference values. Moreover, this paper also tries to explore the correlation between age, body mass index (BMI), aerobic capacity and waist hip ratio (WHR).

Result and Discussion
Table 1. Height measurements of the selected respondents
Table 1 indicates that among 20-30 age group of all women's height parameters are high followed by age group 31-40, age group 41-50 and more than 50 ages.

It clearly indicates how the age increases the height parameters like standing and sitting shoulder, eye and elbow height will decrease. The above result was in accordance with findings of Margot, S. G (2009).

Table 2. Girth measurements of the respondents

Table 2 indicates that girth measurements such as bust, waist, hip and abdomen are increases as per age increases and again decreases as age cross above 50 years. It is observed that among 20-30 age group girth parameters mean score was nearly 30 and equal proportion that is mean score was 40 among 31-50 age group and among more than 50 age group mean score was nearly 35. It is found that girth measurements of women is also helps to analyse the problems with existing body size systems (Hauz, K 2008) [2].

Table 3. Vertical and horizontal reaches of the selected respondents

From the table 3 it is understood that in small age that is 20 - 30 both horizontal and vertical reaches was high as age increases the reaches of individual will decreases because of high weight gain and also health problems. The anthropometric characteristics of the users are essential for the accomplishment of various tasks safety and economically. If mismatches evict among the human anthropometric data, equipment's, tools and furniture, it may result in various health problems. (Ismaila, S. O., 2013) [3].

Table 4 Body mass index and Aerobic capacity of the respondents

The table 4 shows that body mass index (BMI) as an indicator of under nutrition or chronic energy deficiency (Robert *et al*., 2002) [8] and it also a good indicator of obesity (Murguia *et al.,* 2012). Among 20-30 age group majority of women (10%) belonged to normal group with BMI score 20.5 to 25.0 followed by 31-40 age group (80%) belonged to obese grade II with BMI score >30 and both 41-50 (11.25%) and > 50 (10%) age group belonged to obese grade I with BMI score 25.0 to 30.0. Aerobic capacity is also a health indicator and high aerobic capacity result in lower risk of sick level (Jorein *et al*., 2011) [4]. Among 20-30 age group majority of women (20%) belonged to low average with VO2 score 16 to 25.0 followed by 31-40 age group (10%) belonged to high average with VO2 score 26 to 30, 41-50 age group (8.75%) belonged to good with VO2 score 31 to 40 and >50 age group (7.5%) belonged to low average with VO2 score 16 to 25.

Table 5: Waist and hip ratio (WHR) among selected respondents

The waist and hip ratio (WHR) has been used as an indicator or measure of health and the risk of developing serious health conditions. The table 5 indicates that the age group 31 to 40 is high risk of developing health problems followed by more than 41 age group are slightly is risk of developing health problems and the age group between 20 to 30 WHR score was 0.79 hence they are not under risk of any health problems.

Table 6 Relationship between age, body mass index and Aerobic capacity

Table 6 indicates the relationship between age and body mass index was significant at the 0.01 level and relationship between age and aerobic capacity as well as waist hip ratio is significant at the 0.05 level.

Conclusion

Anthropometric data of four different age group of women were collected and analyzed the body mass index, aerobic capacity and waist hip ratio and summarized the result. The relationship between age and body mass index was significant at 0.01 level and relationship between age and aerobic capacity, waist hip ratio was significant at the 0.05 level. Body mass index, aerobic capacity and waist hip ratio helps to know the present as well as future health risk of an individual. The Body mass index more than 30 indicates risk of cardiovascular diseases and aerobic capacity less than 15 indicates poor health status. Waist hip ratio more than 0.80 for women indicates risk of abdominal obesity. Assessing the health status of individual is more important.

Table 1: Height measurements of the selected respondents. n=80

Parameters	20-30	31-40	41-50	>50
Height Measurements				
Total height	148.52 (±24.52)	155.13 (±4.67)	60.15 (±6.86)	153.65 (±4.65)
Standing eye level	141.63 (±5.72)	140.55 (±8.14)	140.70 (±8.24)	142.55 (±3.47)
Sitting eye level	104.35 (±24.91)	112.22 (±4.86)	112.37 (±4.86)	123.27 (±4.87)
Standing shoulder height	128.16 (±4.01)	131.25 (±4.88)	124.80 (±26.60)	126.45 (±3.39)
Sitting shoulder height	94.86 (±12.13)	96.52 (±5.53)	96.42 (±5.78)	107.90 (±7.58)
Standing elbow height	101.07 (±3.78)	101.55 (±4.04)	101.95 (±3.57)	99.31 (±5.87)
Sitting elbow height	69.18 (±6.08)	71.22 (±4.72)	70.87 (±4.64)	83.67 (±6.72)
Knee height	46.97 (±3.29)	48.45 (±3.56)	48.61 (±3.56)	48.32 (±2.34)

Table 2: Girth measurements of the selected respondents. n=80

Girth parameters	20-30	31-40	41-50	>50
Bust	34.42 (±3.15)	35.47 (±1.98)	35.72 (±2.05)	33.39 (±3.37)
Waist	29.67 (±4.45)	33.82 (±4.61)	33.83 (±4.53)	31.21 (±3.76)
Hip	35.31 (±4.51)	39.87 (±2.92)	39.87 (±2.93)	39.33 (±5.62)
Abdomen	30.37 (±3.30)	34.08 (±3.08)	33.95 (±2.97)	34.55 (±6.96)

Table 3: Vertical and horizontal reaches of the respondents. n=80

Parameters	20-30	31-40	41-50	>50
Horizontal Reaches:				
Right maximum	68.52 (68.67)	67.00 (3.38)	68.70 (3.11)	72.12 (3.31)
Left maximum	66.00 (66.71)	63.00 (4.23)	67.00 (3.38)	69.30 (3.64)
Right comfort	66.00 (66.71)	64.05 (4.23)	66.20 (3.20)	70.02 (2.16)
Left comfort	62.51 (63.62)	64.25 (4.32)	64.25 (4.32)	67.22 (2.99)
Vertical Reaches:				
Right maximum	161.00 (106.91)	65.00 (4.40)	67.55 (4.05)	71.44 (6.66)
Left maximum	160.00 (100.05)	63.00 (4.40)	66.00 (3.95)	67.77 (1.81)
Right comfort	158.00 (76.85)	62.11 (3.39)	65.32 (4.49)	67.28 (2.59)
Left comfort	157.00 (74.08)	60.15 (6.86)	64.00 (4.02)	64.22 (2.43)

Table 4: Body mass index and Aerobic capacity of the respondents n=80

Interpretation	20-30		31-40		41-50		>50	
Body Mass Index	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
*CED grade III (severe)	02	10	01	05	00	00	01	05
*CED grade II (moderate)	01	05	00	00	00	00	03	15
*CED grade I (mild)	03	15	00	00	00	00	02	10
Low weight normal	02	10	00	00	00	00	01	05
Normal	08	40	00	00	08	40	02	10
Obese grade I	04	20	02	10	09	45	08	40
Obese grade II	00	00	17	85	03	15	03	15
Aerobic Capacity								
Poor	02	10	01	05	00	00	02	10
Low average	16	80	07	35	06	30	06	30
High average	01	05	08	40	06	30	08	40
Good	01	05	04	20	07	35	03	15
Very good	00	00	00	00	00	00	01	05
Excellent	00	00	00	00	01	05	00	00

Freq. - Frequency

Table 5: Waist in hip ratio among selected respondents. n=80

Waist in hip ratio	20-30	31-40	41-50	>50
For women cut-off Point in 0.80	0.79	0.87	0.84	0.81

Table 6: Relationship between age, body mass index and aerobic capacity

Particulars	Pearson Correlation 'r' value
Body mass index	0.775**
Aerobic capacity	0.425*
Waist hip ratio	0.161*

** significant at 0.01 level * significant at 0.05 level

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