



# Nutritional Status & Bio-Chemical Estimation Of The Rural Adult Women Respondents In Dindigul District

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## Abstract

The burden of diabetes is high and increasing globally, and in developing economies like India, mainly fueled by the increasing prevalence of overweight/obesity and unhealthy lifestyles. The estimates in 2019 showed that 77 million individuals had diabetes in India, which is expected to rise to over 134 million by 2045. Approximately 57% of these individuals remain undiagnosed. Hence, the present study was undertaken with the following objectives: To know the socio-economic profile and demographic background of the rural adult women respondents; To assess the nutritional status of the rural adult women respondents through Anthropometric assessment and Bio chemical estimation among rural adult women-respondents. A well structured interview schedule was framed to know the socio economic status and obesity was assessed through anthropometric measurement like Height, Weight, BMI; bio chemical estimation: Fasting Blood Glucose was recorded. And the present study concludes that 81.3% of the rural adult women respondents were either obese or overweight. Total 89.7% of the rural adult women were at risk level with abdominal obesity. The present study that more than two-fifth of the women's fasting blood glucose level was at risk.

**Key words:** Overweight, Obesity, Fasting blood glucose, Diabetes

## Introduction

Globally, the non-communicable disease is the leading cause of death. Almost 67 percent of all deaths are due to non-communicable diseases<sup>1</sup>. The burden of non-communicable diseases like diabetes is no longer the disease of wealthy developed nations<sup>2</sup>. Type 2 diabetes has become a major health challenge worldwide, in 2000, there were an estimated 175 million people with diabetes worldwide and by 2030 the projected estimate of diabetes is 354 million. The prevalence of diabetes is swiftly increasing over the globe at an alarming rate. According to the International Federation of Diabetes, 415 million adults around the world are suffering from diabetes, and it is estimated that the numbers will reach around 642 million by 2040<sup>3</sup>. India is home to 69.1 million people with DM and is estimated to have the second highest number of cases of DM in the world after China in 2015<sup>4</sup>. Diabetes has become one of the leading causes of premature illness and deaths in most countries, mainly through the increased risk of cardiovascular disease which is responsible for over 50% of deaths in persons with diabetes<sup>5</sup>. Screening for diabetes is seldom done in rural areas, resulting in a much greater burden of undiagnosed diabetes in rural areas. Most of these cases are type 2 diabetes. The earlier a person is diagnosed and management initiated, the better the chances of preventing harmful and costly complications<sup>6</sup>.

## OBJECTIVES AND SETTING OF THE STUDY

The present study was conducted at Nilakottai Block in Dindigul District with the following specific objectives:

1. To know the socio-economic profile and demographic background of the rural adult women respondents;

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<sup>1</sup> Mote, B. N., 2016, A regional epidemiology of India's "NCD's risk factors" focusing particularly on Maharashtra: A call for "Health promotion" once again. *International Journal of Medicine and Public Health*, 6(1).

<sup>2</sup> Mohan, V., Anjana, R. M., Pradeepa, R., Unnikrishnan, R., Tanvir, K., and Das, A. K., 2017, The ICMR INDIAB Study—A Compendium of Type 2 Diabetes in India: Lessons Learnt for the Nation. API.

<sup>3</sup> International Diabetes Federation (IDF). *IDF Diabetes Atlas*. 7th ed. 2015. Available from: <http://www.idf.org/idf-diabetesatlas-seventh-edition>. [Last accessed on 2016 May 11].

<sup>4</sup> International Diabetes Federation. *IDF Diabetic Atlas 7th Edition*. <http://www.idf.org/idf-diabetes-atlas-seventh-edition>. Accessed 30 Aug 2016.

<sup>5</sup> International Diabetes Federation (IDF). *IDF Diabetes Atlas*. 6th ed. 2013. Available from: <http://www.diabetesatlas.org/>. [Last accessed on 2016 May 11].

<sup>6</sup> Census of India. Rural urban distribution of population. office of the registrar general and census commissioner, India. Available from: [http://censusindia.gov.in/2011-prov-results/paper2/data\\_files/india/Rural\\_Urban\\_2011.pdf](http://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_Urban_2011.pdf). (Accessed on 7 nov 2016).

2. To assess the nutritional status of the rural adult women respondents through Anthropometric assessment and Bio-chemical estimation; and

## Materials and Methods

A total of 522 rural adult women respondents above the age of 18 to 57 who live in and around Nilakottai Block of Dindigul District in Tamil Nadu were assessed for their socio-economic status by a well structured interview schedule and obesity through anthropometric measurement like Height, Weight, BMI; bio-chemical estimation: Fasting Blood Glucose was also recorded. Women who cannot move around physically and with any other health issues were excluded. The collected data were analysed by using descriptive analytical method to arrive at general conclusions.

## RESULTS AND DISCUSSION

### Socio-Economic Profile:

Out of 522 rural adult women respondents, nearly 46.6 per cent of women were in age group of 28-37 years followed by 38-47, 48-57, and 18-27 age-group women and their percentage in the total was 28.9, 16.4, and 8.0, respectively. The educational status of the women-respondents has indicated a pattern that of the total while about two-fifth (39.5%) of them were found as illiterates the remaining in the total was constituted by the women-respondents pursued Primary, Secondary, Senior/Higher Secondary education and Others - Collegiate, Diploma, Teacher training - have constituted the remaining) and have constituted 26.8%, 18.4%, 8.6% and 6.7% in the total, respectively. The occupational status of the women-respondents indicates that while about one-third (32.8%) of the total women were found as farmers another one-fifth in the total was constituted by daily wagers and the remaining were found as Agricultural Labour (12.8%), Pvt. Employee (14.0%), Homemaker (11.7%), Govt. Employee (4.1%), and Self-Employed (4.3%) and altogether have constituted the remaining 46.9% in the total. As far as the women's marital status is concerned huge majority (95.4%) of them were married while single/unmarried (1.3%) and widowed (3.3%) have constituted the remaining 4.6% in the total. It is found from the above table that of the total one-third (34.3%) of them were doing sedentary works whereas the remaining majority (65.7%) in the total were doing moderate level works.

**DEMOGRAPHIC BACKGROUND OF THE WOMEN**

The grouping of the respondents according to their religion shows that of the total a vast majority (87.4%) of them were Hindus followed by Christian (11.5%) and Muslim (1.1%). The categorization of the respondents as per their community group shows that of the total nearly half (46.2%) them belongs to Scheduled Castes while another two-fifth (43.7%) in the total were from Backward Castes whereas the remaining 10.1% in the total were from Most Backward Castes. While grouping the women based on the family type vast majority (86.0%) of the women were hailed from nuclear family while the remaining 14.0% were from joint family. It was found that of the total three-fifth (61.5%) of the women belonged to medium size families which includes 5-8 members and rest of 38.5 per cent of were from small size families' which having maximum of four members. More than three-fifths (64.0%) of the total women earned ₹ <5,000/- per month while another 16.3% in the total earned ₹ 5,001-10,000/-per month whereas ₹ 10,000 to 15,000/- and ₹ >15,001/- per month was earned by 5.7% and 1.9% respondents, respectively. However, the remaining 12.1% in the total belong to 'no income' category. Further, it was found from the present study that the women earn an average of ₹ 5, 792/-, per month.

**Nutritional Status of the Rural Adult Women****TABLE 1****ANTHROPOMETRIC PROFILE OF THE RURAL ADULT WOMEN**

Variable	No. of Women	Percentage
<b>Body Mass Index ( in kg/m<sup>2</sup>)</b>		
Under weight (Below 18.5)	13	2.4
Normal (18.5 – 22.9)	85	16.3
Over weight (23- 24.9)	290	55.6
Obese (Above 25)	134	25.7
<b>Total</b>	<b>522</b>	<b>100.0</b>
<b>Waist Circumference (in cm)</b>		
Normal (<80 )	54	10.3
At risk (>80 )	468	89.7
<b>Total</b>	<b>522</b>	<b>100.0</b>
<b>Waist-Hip Ratio</b>		
Normal (<0.81)	132	25.3
At risk (>0.81)	390	74.7
<b>Total</b>	<b>522</b>	<b>100.0</b>

Table 1 presents anthropometric profile – BMI, Waist Circumference, and Waist-Hip Ratio - of women. The BMI of the women selected for the study shows that of the total more than half of the (55.6%) were with overweight while another 25.7% of the total were obese whereas 2.4% in the total were identified as underweight. Overweight or obesity is assessed by measuring body mass index (BMI), which is calculated as weight in kg/height in meter<sup>2</sup>. For Indian population 18.5 to 22.9 BMI is normal, 23 to 24.9 is considered as overweight and BMI of  $\geq 25$  kg/m<sup>2</sup> is considered as obesity in Indians.<sup>7</sup> Apart from BMI which is a measure of general adiposity, it is also important to measure the abdominal adiposity, which is also associated with a higher cardiovascular risk. The waist circumference (WC) of the selected women shows that huge majority (89.7%) of the rural adult women's WC was 'at-risk' level while the rest 10.3% of the women's WC was at 'normal' level. The analysis shows the increased risk of abdominal obesity among women in this age category. It is more crucial than excess visceral fat distribution shown by BMI at higher levels.<sup>8</sup>

As far as women's Waist Hip Ratio (WHR) is concerned it was observed from the distribution that three-fourth (75.7%) of the rural women's WHR was 'at-risk' level whereas 'normal' level WHR was observed in the rest 25.3% women. Therefore, it would be concluded that majority of the rural adult women's WHR was 'at-risk' level.

**TABLE 2**

**FASTING BLOOD GLUCOSE LEVELS OF THE RURAL ADULT WOMEN RESPONDENTS**

<b>Fasting Blood Glucose</b>	<b>No. of Women</b>	<b>Percentage</b>
Normal (< 100mg/dl)	287	55.0
Pre-diabetic ( $\geq 100$ and < 126 mg/dl)	223	42.7
Diabetic ( $\geq 126$ mg/dl)	12	2.3
<b>Total</b>	<b>522</b>	<b>100.0</b>

The women's fasting blood glucose level is presented in Table 2. The fasting blood glucose levels in the rural adult women-respondents brings out the fact that of the total 55.0% were with normal fasting blood pressure whereas the pre-diabetic (42.7%) and diabetic (2.3%) respondents' fasting blood glucose

<sup>7</sup>. Farzadfar F, Murray CJ, Gakidou E, Bossert T, Namdaritabar H, Alikhani S. (2012). Effectiveness of diabetes and hypertension management by rural primary health-care workers (Behvarz workers) in Iran: a nationally representative observational study. *Lancet*. 7; 379(9810), 47-54.

<sup>8</sup>. <http://www.cdc.gov/nccdphp/dnpa/obesity/defining.htm> and [http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/risk.html](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/risk.html).

was above at-risk. Hence, it is evident from the present study that more than two-fifth of the women's fasting blood glucose level was at risk.

## Conclusion

While concluding the present study it would be highlighted that, prevalence of Diabetic was found among majority of the rural adult women respondents with high blood glucose study and found in overweight category. However, it is concluded that majority of the respondents blood pressure were in at-risk as far as waist circumference is concerned.

## Reference

1. Farzadfar F, Murray CJ, Gakidou E, Bossert T, Namdaritabar H, Alikhani S. (2012). Effectiveness of diabetes and hypertension management by rural primary health-care workers (Behvarz workers) in Iran: a nationally representative observational study. *Lancet*. 7; 379(9810), 47-54.
2. International Diabetes Federation (IDF). IDF Diabetes Atlas. 7th ed. 2015. Available from: <http://www.idf.org/idf-diabetesatlas-seventh-edition>. [Last accessed on 2016 May 11].
3. <http://www.cdc.gov/nccdphp/dnpa/obesity/defining.htm> and [http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/risk.html](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/risk.html).
4. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995–2025: prevalence, numerical estimates, and projections. *Diabetes Care*. 1998;**21**:1414–1431. & . ( [PubMed] [Google Scholar]
5. Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes Res Clin Pract*. 2010;**87**:4–14. & . ( [PubMed] [Google Scholar]
6. Mote, B. N., 2016, A regional epidemiology of India's "NCD's risk factors" focusing particularly on Maharashtra: A call for "Health promotion" once again. *International Journal of Medicine and Public Health*, 6(1).
7. Mohan, V., Anjana, R. M., Pradeepa, R., Unnikrishnan, R., Tanvir, K., and Das, A. K., 2017, The ICMR INDIAB Study—A Compendium of Type 2 Diabetes in India: Lessons Learnt for the Nation. API.
8. International Diabetes Federation (IDF). IDF Diabetes Atlas. 7th ed. 2015. Available from: <http://www.idf.org/idf-diabetesatlas-seventh-edition>. [Last accessed on 2016 May 11].
9. International Diabetes Federation. IDF Diabetic Atlas 7th Edition. <http://www.idf.org/idf-diabetes-atlas-seventh-edition>. Accessed 30 Aug 2016.
10. International Diabetes Federation (IDF). IDF Diabetes Atlas. 6th ed. 2013. Available from: <http://www.diabetesatlas.org/>. [Last accessed on 2016 May 11].
11. Census of India. Rural urban distribution of population. office of the registrar general and census commissioner, India. Available from: [http://censusindia.gov.in/2011-prov-results/paper2/data\\_files/india/Rural\\_Urban\\_2011.pdf](http://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_Urban_2011.pdf). (Accessed on 7 nov 2016).