

# Association between Body Mass Index, Physical Activity Level and Various domain of Quality of Life among undernourished women in rural area in Prayagraj district, India

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## Abstract

### Introduction-

According to NFHS – 2019-21 in Prayagraj district 17.3% of the reproductive age women are undernourished (Chronic Energy Deficiency) and their BMI are  $< 18.5 \text{ kg/m}^2$ , women who have high risk waist hip ratio ( $\geq 0.85$ ) are 48.8% and non-pregnant reproductive age women age who are anemic i.e. 46.5% .

### Objectives –

To assess the BMI, PAL and Quality of life among non - lactating and non-pregnant women reproductive age 15 - 49 age groups.

### Methods –

This study is based on community based cross sectional study. Total no. of 310 of the female respondents participants in this study and simple random technique were used to select samples. Data was collected from January 2019 to February 2020 using structured questionnaire and anthropometric measurement.

### Result –

From this study it was revealed that various domain of Quality of life and BMI was not significant to each other whereas relation between quality of life and pal is statistically significant.

### Conclusion and discussion –

In this study quality of life of the rural women was not good according to this study Maximum of the study subject had prone to severe Chronic energy deficiency that is risky and their QOL must be improve through nutrition intervention etc.

**Keywords:** BMI, PAL, Quality of Life, Chronic Energy Deficiency, rural area, reproductive age women.

## Introduction

Chronic energy deficiency (CED)/ Under nutrition is a condition of a body characterized by low body weight and low energy stores, possibly limited physical capacity due to deprivation of food over a long period of time with body mass index (BMI) less than  $18.5 \text{ kg/m}^2$  for adults. Chronic energy deficiency is higher among rural women of reproductive age and caused by eating too little or having an unbalanced diet that lacks adequate nutrients. CED before pregnancy causes major prenatal risks like stillbirths, preterm births, and small for gestational age and low birth weight babies. The most popular method to assess the nutritional status such as Chronic Energy Deficiency is Anthropometric measurement like BMI, Waist Hip Ratio, Mid Upper Arm Circumference, skin fold thickness measurement, Triceps etc. BMI is a significant health indicator to assessment of Undernutrition / Chronic Energy Deficiency, over nutrition and Obese. According to WHO normal BMI of healthy person is  $18.5 - 24.5$ ,  $< 18.4$  considered as a underweight while  $> 24.4$  or above considered as Overweight/ Obese and table by WHO given in below Table.

Classification	BMI
Underweight	18.5
Severe CED Class III	$< 16.0$
Moderate CED Class II	16.0 – 16.9
Mild CED Class I	17.0 – 18.4
Normal	18.5 – 24.9
Pre- Obese	25.0 – 29.9
Obese Grade I	30.0 – 34.9
Obese Grade II	35.0 – 39.9
Obese Grade III	$\geq 40$
Classification of body weight in adults according to BMI (modified from WHO, 1998)	

Quality of life (QOL) is defined by the **World Health Organization** as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". Standard indicators of the quality of life include wealth, employment, the environment, physical and mental health, education, recreation and leisure time, social belonging, religious beliefs, safety, security and freedom. QOL has a wide range of contexts, including the fields of international development, healthcare, politics and employment. Health related QOL (HRQOL) is an evaluation of QOL and its relationship with health. BMI

## Methods and Materials

### Study area and period

The study area was conducted in Prayagraj district, selected two block Holagarh and Mauima block i.e. belong from rural area between January 2019 to February 2020.

**Study design-** cross sectional community based study.

**Inclusion and exclusion criteria** – Non Pregnant and non- lactating reproductive age undernourished and willingly to participated women only included in the study whereas Pregnant lactating normal and obese and not willing to participate excluded from this study.

**Sample size determination** – Total 310 female respondents were selected from total population and SPSS 16 versions used in this study.

**Sampling procedure** – Purposive random sampling technique was used according to fulfill the purpose of the study.

**Data collection tools & techniques** – Data was collected through interview schedule using pre testing and structured questionnaire To assessing Anthropometric using Height weight BMI. For quality of life WHOQOL was used and standard questionnaire was used for 24 hour PAL recorded and calculated it by 24 hours. Women with a BMI of less than 18.5kg/m<sup>2</sup> were considered as chronic energy deficient women according to objective.

Ethical approval and consent- Ethical clearance was obtained from the Institute of Medical Science (IMS) Banaras Hindu University and also permission was granted by IMS by ethical committee member. Participants were informed they have full right to denial to participate in the study and can withdraw if they want.

## Result & discussion -

**Table no – 1 Association of various domain of QOL with the BMI of the respondents**

Physical	BMI							
	Mild CED Class I		Moderate (CED Class II)		Severe CED Class III		Total	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Poor	18	40.0	20	21.7	35	20.2	73	23.5
Medium	27	60.0	67	72.8	130	75.1	224	72.3
High	0	0.0	5	5.5	8	4.7	13	4.2
Total	45	100.0	92	100.0	173	100.0	310	100.0
Mean ± SD	37.96 ± 14.17		43.02 ± 15.94		41.01 ± 14.18		44.06 ± 15.50	

F = 181, P > 0.05

### Psychological

Poor	20	44.4	31	33.7	60	34.7	111	35.0
Medium	24	53.4	57	62.0	108	62.4	189	61.0
High	1	2.2	4	4.3	5	2.9	10	3.2
Mean ± SD	37.96 ± 14.17		43.02 ± 15.94		41.01 ± 14.18		44.06 ± 15.50	

F = 181, P > 0.05

### Social relationship

Poor	33	73.3	51	55.4	105	60.7	189	61.0
Medium	11	24.5	34	37.0	57	32.9	102	32.9
High	1	2.2	7	7.6	11	6.4	19	6.1
Mean ± SD	27.38 ± 17.98		33.89 ± 22.67		31.05 ± 21.21		31.36 ± 21.26	

F = 1.46, P > 0.05

### Environment

Poor	33	73.3	55	59.8	103	59.7	191	61.6
Medium	12	26.7	35	38.0	69	39.9	116	37.4
High	0	0.0	2	2.2	1	0.6	3	1.0
Mean ± SD	30.62 ± 9.75		34.86 ± 12.70		33.50 ± 13.09		33.48 ± 12.58	

F = 1.73, P > 0.05

From the above table revealed that quality of life Physical domain 75.1% of the female respondents showing severe Chronic Energy Deficiency grading with medium appearance of their Physical domain only 5.5% were moderate chronic energy deficiency with high physical domain mean their QOL were not looking satisfactory. According to their Mean  $\pm$  SD Maximum Mean SD is  $43.02 \pm 15.94$  found in Moderate Chronic Energy Deficiency instead of  $41.01 \pm 14.18$  and  $37.96 \pm 14.17$  respectively and significant was found not significant. Similarly, it was found from the table maximum no of the respondents i.e. 62.4% was of the respondents were showing characteristics of severe chronic energy deficiency and their quality of life considered as medium and only 2.2% of the respondents was prone to mild chronic energy deficiency and maximum Mean SD was  $43.02 \pm 15.94$  found in moderate chronic energy deficient women instead of mild and severe. The significant was found insignificant. Likewise, in social relationship and environment based quality of life was not found statistically significant.

**Table no. – 2 Association of various domain of QOL with PAL of the respondents**

Table No. 2: Distribution of various domain of QOL with PALE of the respondents								
Physical	PAL							
	Mild		Moderate		Severe		Total	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Poor	1	5.0	39	23.4	33	26.8	73	22.5
Medium	16	80.0	121	72.5	87	70.7	224	72.3
High	3	15.0	7	4.1	3	2.5	13	4.2
Total	20	100.0	167	100.0	123	100.0	310	100.0
Mean $\pm$ SD	56.35 $\pm$ 14.52		43.68 $\pm$ 15.68		42.58 $\pm$ 14.84		44.06 $\pm$ 15.58	
F = 4.19, P< 0.05, Significant pairs (1 Vs 3)								

#### Psychological

Psychological								
Poor	6	30.0	50	29.9	55	44.7	111	35.0
Medium	12	60.0	111	66.5	66	53.7	189	61.0
High	2	10.0	6	3.6	2	1.6	10	3.2
Mean ± SD	48.20 ± 18.70		42.04 ± 14.38		38.83 ± 14.19		41.16 ± 15.50	
F = 4.19, P< 0.05, Significant pairs (1 Vs 3)								

#### Social relationship

Social Relationship								
Poor	8	40.0	106	63.5	75	61.0	189	61.0
Medium	8	40.0	50	29.9	44	35.8	102	32.9
High	4	20.0	11	6.6	4	3.2	19	6.1
Mean ± SD	42.15 ± 25.04		30.89 ± 21.88		30.24 ± 19.38		31.26 ± 21.26	
F =2.82, P> 0.05, Significant pairs								

#### Environment

Environment								
Poor	7	35.0	105	62.9	79	64.2	191	61.6
Medium	13	65.0	59	35.3	44	35.8	116	37.4
High	0	0.00	3	1.8	0	0.0	3	1.0
Mean ± SD	41.70 ± 13.58		33.48 ± 13.22		32.15 ± 11.02		33.48 ± 12.58	
F = 5.09, P< 0.001, Significant pairs (1 Vs 2,3)								

According to above table it was depicted that Maximum Mean SD is  $56.35 \pm 14.52$  found in Mild chronic energy deficiency while  $43.68 \pm 15.68$  (Moderate CED) and  $42.58 \pm 14.84$  (Severe CED III) and relationship between PAL and quality of life was found significant. Similarly according to their Psychological domain of quality of life Maximum Mean SD was found  $48.20 \pm 18.70$  found in Mild category of CED and  $42.04 \pm 14.38$  (Moderate CED), and  $38.83 \pm 14.19$  (Severe CED) respectively. And significant was found significant. On the contrary of their social relationship was found statistically insignificant. While environment based relationship was found highly significant between Pal and environment.

#### Conclusion –

On the behalf of the present study it was concluded that Quality of life was not found satisfactory in this study. There was no positive relation between Body Mass Index and different domains of Quality of life. And it was also found in relationship between PAL and quality of life was significant except their social relationship.

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