OBESITY A STATE OF MALNUTRITION OR DISORDER: THE CONSEQUENCE IN RESPECT OF INDIA

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ABSTRACT

Obesity is over nutrition coming from extra fat engrossing our body. India is a country where under nutrition is one of the foremost problems. But obesity is now a mounting issue in India. Last ten years obesity in India increases more than double. Overnutrition happens when you take in more of a nutrient (or nutrients) than you need every day. While many people think malnutrition means a lack of nutrients, overconsumption or extra fat absorbing body is also considered malnutrition because it has also a negative health consequence. Obesity is the cause of many critical diseases like heart disease, stroke, diabetes, cholesterol etc. So, for healthy life obesity should be controlled. We collect data from NFHS-5. Data indicates rate of increase in women obesity is more than the man obesity in India. The urban people are suffering more obesity than rural people. In conclusion, Income is an important factor which intensifies the obesity. Others factors are standard of living, excess calorie consumption, frequent sleep is the significant factor for obesity. To control obesity, we require daily exercise and diet. Now a day, everything of our life is control by machinery items. Modern life utilizes convenience tools are televisions, computers videogames, remote controls, washing machines and also mobile phone. More people are waste their time on this device. Result of that they are not exercise. These tools are help to save huge calorie in our body. This creates over Weight.

Keywords: Obesity, BMI(Body Mass Index), Disease, Diet, Over-Weight, Malnutrition.

Introduction

Under-nutrition and over-nutrition are the two different problems but these two are coexist in most of the developing country. So, India is a country were both problems are co-exit and it will be a double burden in respect of our country. Under nutrition and underweight is the problem since independence, but under weight is the recent growing problem in our country. This overweight percentage is intensified due to covid-19.

Overweight means consuming too many calories (or energy) will cause you to gain weight over time unless you intensification of physical activities. It doesn't matter if those extra calories come from macronutrients, because the body takes whatever it doesn't need and increase fat.

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Over nutrition is common estimators in developed countries. Another type of malnutrition is the type of over nutrition which also known as micronutrient undernutrition. That means there is very low micronutrient in food availability. Over nutrition brings overweight or obesity, which are danger factors for cardiovascular disease, various types of cancer, and also type 2 diabetes. Micronutrient over nutrition occurs when you consume ample of a certain nutrient. It's possible to get sufficient of vitamins or minerals. This happens when you take superdoses of dietary supplements, which indicating micronutrient from food is rare.

Micronutrient over nutrition can cause acute intoxication, such as taking sufficient amount of iron pills at once. The large doses of a specific vitamin over several weeks or months brings chronic malnutrition. Undernutrition occurs when you don't get enough of a nutrient (or nutrients) or calories in general. Protein deficiency A lack of protein can cause PEM, even though there is still some carbohydrate or fat in the diet. This condition is called kwashiorkor. Iron and Calcium are often deficient in this diet. Iron is little in uphill of 25% of people in worldwide, this type deficiency of young children, female mother, and pregnant women. Research suggested that the both teenagers and older adults do not have adequate calcium through their diet.

The nutrient deficiency is owing to a health situation such as pernicious anemia (which results in a lack of vitamin B12, Crohn's disease, celiac disease, or infection. Symptoms which don't occur immediately, but arise over time. Malabsorption arises when the digestive structure can't break down nutrients for suitable absorption. This can lead to micronutrient under nutrition. Malabsorption can be treated with dietary fluctuations, but may want medical treatment. Signs and symptoms related with malnutrition can vary depending on the type of malnutrition and underlying cause, and this is signs of undernutrition. The control of the signs of undernutrition.

Weight loss, Lowered appetite, Fatigue, Weakness, Frequent illness, Reduced concentration, Intolerance to cold, Poor wound healing, rashes, dry skin, Mood disruptions, Bruising, Hair thinning. Diabetes, high blood pressure, to much cholesterol are the symptoms of overnutrition. So, overnutrition of vitamins and minerals can depend on the adequate and proper nutriention. The dietary adjustments to reduce overall calories and improve the balance of the diet to include more fruits and vegetables, calcium sources, are preventive measure of overnutrition.

It also helps to avoid junk food, which are high in calories but have little nutritional value. The treatment undernutrition by making sure to eat adequately of whole, nutrient-dense foods such as a large variability of fruits and vegetables, whole grains, and lean proteins. And also,a multivitamin or supplement with a specific nutrient that may be lacking in this paper.

The most susceptible to over nutrition in the United States. Children who grow up in low socioeconomic status environments are mainly to energy overnutrition. They may lack access to nutrient-dense food and instead consume energy-dense food (high in calories but low in protein, vitamins, and minerals).

Obesity is one of the vitalissues not only India but also in the whole world. Obesity is nothing but the over nutrition or additional fat including body. This is one kind of malnutrition. Obesity is a disorder where a person has accumulated so much body fat that it might have a negative effect on their health.

If a person's bodyweight is at least 20% higher than it should be, he or she is considered obese. If your Body Mass Index (BMI) is between 25 and 29.9 you are treated as overweight. If Body Mass Index is above 30 or over you are treated as obese. Obesity should be depending on income of the family. So, the Private school students have more obesity than public school (Shabana T, Vijay V.2009).various reason for obesity of the become obese for many reasons.

Recent timerich people become richer, and poor people become poorer. This excess money rich people they will acquire fast food (fat rich food). So, people consume huge rate of calorie consumption. Excess calorie consumption produces obesity.

Proper nutrition can be possible by every day walking in the road. Walking is the best medicine for our health.But in recent time people are depend on the machine such as car. Without car many Indian people will not walk half a mile of his destination. Such lethargies create obesity.

Physical activity has an effect on how much heavy work done, and such an effect on how your body deals with food. various studies have shown that physical activity has a beneficial effect on your insulin levels - keeping them stable. Unstable insulin levels are related with weight gain.

Those child watch television in their bedroom are more overweight than child those are not doing this, researchers from the Pennington Biomedical Research Center in Baton Rouge, LA, reported in the *American Journal of Preventive Medicine*(2012)¹¹.

Various research papers have suggested that if you don't sleep sufficient thentheir chance of more risk. Short sleep is one of the tendencies of obesity both in adult and child. Short sleep and frequent sleep are increases over weight. So, one time and long duration of sleep is good, but short term and frequent sleep is intensifying obese.

High fructose diets will be the one of the main causes of obesity. It will directly pressure on our brain and increase obesity. Some research article also suggested that medications also the cause weight gain. Significant weight gain is connected with some regularly suggested medicines.

Obesity is one of the most critical diseases because if a person is overweight then it's became harder to reduce the weight. In addition to this study, research published in the journal Nature Communications in 2015 recommends that weight loss is harder when we carry more fat. Various studies show that obesity comes from the parent gene. That is heredity, it is the inborn characteristic of every human being. Obesity gene is impulsively increasing fatty Wight of the body.

In this research paper included three parts which are as follows:

- Introduction
- Data interpretation
- Methodology
- Empirical findings
- Conclusions
- Recommendations
- Appendix

Data Interpretation

We consider the data from the NFHS-5. Comparing these two levels of data presentation we calculate the percentage of increase obesity in various states in India. These are as follows.

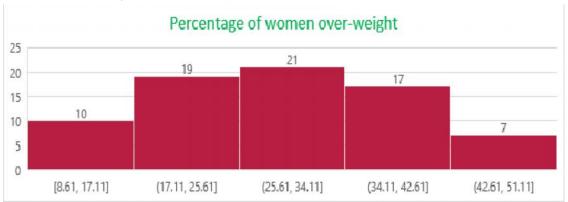


Figure 1

From above data we get in the range of (8.61- 17.11) is belong 10 states, in the next range (17.11-25.61) is lies 19 states, in the range (25.61-34.11) is belong 21 states, in the range of (34.11-42.61) in this range is lies 17 state, and the last of all the (42.61-51.11) range exist 7 states. It shows that the middle most range is highest which indicates the central tendency.

From these data, we get the average 29% of women are over-weighted. Jharkhand rural have lowest percentage (8.61) of women over-weight, where Puducherry urban have highest percentage (47.62) of women over weight. There is a huge difference in the these two where standard deviations is about 10.

More over 80% of average women have bank account. Nagaland rural have lowest women bank account 55.41. Where Puducherry rural have highest bank account for women. Inter-state difference is about 7.

Almost 67% on an average women use mobile phone. Maximum rural women in Madhya Pradesh are not accustom to the mobile phone. So, the percentage of using mobile phone in Madhya Pradesh rural is 31%. But in Sikkim urban, more people have to use mobile phone (97%). In Sikkim 41% of women are over-weighted.

On an average 12% of Indian women are addict tobacco. Where Mizoram rural have almost 69% of women are addicted by tobacco. Where, standard deviation of addicted women is 14.34 which shows there exit the interstate and urban rural disparity.

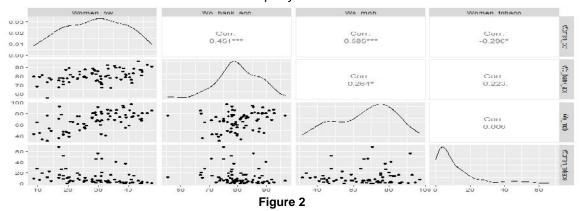


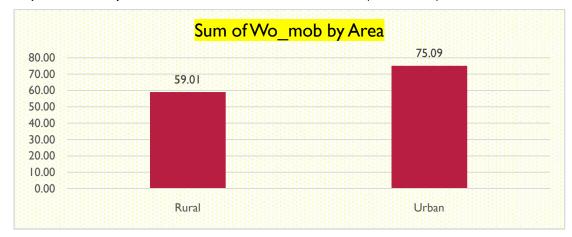
Figure-2, shows that the correlation between each of the variables. Above curve shows that the women over-weight increases with the increase of bank account. The correlation between these two are positive (0.451). Were women mob phone used is also the one of the major important variables in this model, which is also the important variable in this model. The correlation between the women overweight and women used mobile is also positive. The value of correlation coefficient is 0.585. And there is negatively correlated between the use of tobacco. The correlation between these two are negative and which is -0.296.

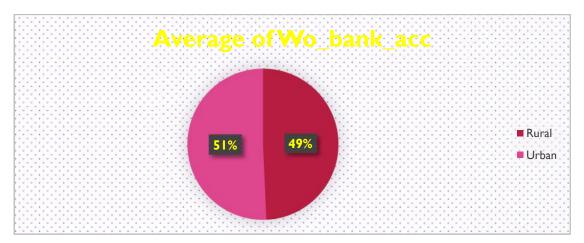
So, in the above data it is says that, it is positively related with the bank account and the women mobile phone. The correlation between these two is 0.264, which indicate that bank account of women requires the mobile phone.



Figure 3

Figure-3 shows that the percentage women overweight increases with the increases of bank account holder. This graph shows that the deep relationship between these two variables. The figure shows that there is rural urban difference in respect of over-weight. Where more over 34% women overweight in urban sector where only 24% in rural sectors.





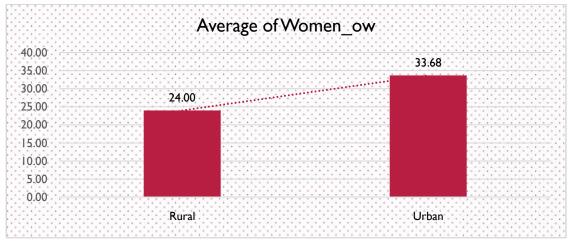


Figure-4

Figure-4 shows that there is huge rural urban difference in Women used in the mobile phone. Use of mobile in rural sectors in women in 59%, it is 75% in urban sectors. Where bank account holder people in rural and urban sector are almost same. Escalations of obesity are effect greater on urban sector than rural sector.

Methodology

The method behind the abnormality of nutrition is of two types, one is under-nutrition and overnutrition. These two are important parameters of the malnutrition. *Nutrition is also two types under nutrition and over nutrition.*

Abnormal Nutrition = Under-nutrition + Over-nutrition

$$AN = UN(Y) + ON(X)$$

$$\frac{d(AN)}{dy} = \frac{d(UN)}{dy} \frac{dy_g}{dy} + \frac{d(ON)}{dy} \frac{\partial x}{\partial y}$$

For minimization, $\frac{d(AN)}{dy} = 0$

$$\frac{d(UN)}{dy} + \frac{d(ON)}{dy}\frac{\partial x}{\partial y} = 0 (2)$$

$$\frac{dy}{dx} = -\frac{d(UN)}{dy} / \frac{d(ON)}{dy}$$

 $\frac{d(UN)}{dy} \le 0$, As income increases the malnutritional decreases. Because as under-nutrition decreases as income of that family increases, and vice-versa.

 $\frac{d(ON)}{dy} \ge 0$, As income increases the overnutrition increases. Because as income increases the which reduce the time of exercise. Which increase the over nutrition.

 $\frac{dy}{dx} \ge 0$, Because if individual increase exercise, then it will reduce the health problem and which will give the opportunity of the more income.

 2^{nd} order condition for minimization is $\frac{d^2y}{d^2x} \ge 0$

From the equation (2) we get the

$$\frac{d(ON)}{dy}\frac{\partial x}{\partial y} = -\frac{d(UN)}{dy}$$

$$\frac{d(ON)}{dy} = -\frac{d(UN)}{dy} * \frac{\partial y}{\partial x}$$

$$\frac{d(UN)}{dy} \leq \ 0 \ , \frac{\partial y}{\partial x} \geq 0$$

we get as income of the any family increases then the chance of over nutrition decreases and vice-versa. So, $\frac{d(ON)}{dy} \ge 0$.

After that consider the linear equation from the data collect from the NFHS-5, we get

Women_ow = A + B_1 * (Wo_bank_acc) + B_2 *(wo mob) + B_3 *(Wo_tobaco)

Women_ow = Percentage of women have over weight.

Wo_bank_acc = Percentage of women have bank account.

Wo mob = Percentage of women have mobile phone.

Wo_tobaco= Percentage of women addicted in tobacco.

In the Weighted Least Squares method, deviation in between the observed and expected values, and which is multiplied by its own weight where is chosen to be contrariwise proportional to the variance of.

For simple linear regression model:

$$y_i = a + bx_i + e_i$$

The Weighted Least Squares function is $\sum w_i e_i^2 = \sum w_i (y_i - a + bx_i)$

For easy computation, let be represented by the sum of square of the residuals, so that $S=\sum w_i e_i^2$

So, both of this model is very useful for dependency measure of the variable. Using these two models and also find the independent variables are fitted or not.

Emperical Findings

Now this above analysis we consider the data from the NFHS-5 data. These data we calculate in the software Stata and also use of R-studio. We consider one dependent variable Women over-weight and others three independent variables which are Percentage of women have bank account, Percentage of women have mobile phone. Percentage of women addicted in tobacco.

From Appendix, Table-2 shows the ordinary least square regression analysis. The result shows that, R-squared is 0.4916 means model is good fit. On the other hand, the coefficient of such model-

Women_ow = (-20.37) + 0.369* (Wo_bank_acc) + 0.322* (wo mob) - 0.171* (Wo_tobaco)

That implies that the Bank account of women is a proxy indicator to income. Everybody knows that income is one of the direct links about the overweight. In this calculation we get the bank account of women is positively associated with the women over-weight. And also significant at the level 1% level.

The second factors which is the percentage of women whohave to use mobile phone. Due to use of mobile phone which spent huge time without any work or exercise. As low exercise means tendency of over-weight increases. So, the percentage of over-weight increases with increases use of the mobile phone. So, the coefficient of the mobile phone is positive (0.322). It is also significant at 0% level. So, here smart phone use as a substitution indicator of the obesity. So, it is an important variable for intensify the overweight or obesity.

Tobacco addiction of women is an inversely effected by the over-weight because use of tobacco will increase the illness of the health which helpful to decrease the obesity. So, it is negatively related with the women over-weight may be decreases by 17 percent. And it is also significant. It is also significant at 1% level. So, for one percent change in women bank account women overweight change by 37 percent, women mobile phone will change by 32 percent, and tobacco is a negative indicator of this model. Because increase of tobacco use it also increase the health problem and decrease the obesity.

From Appendix, Table-3 shows that the weighted least square method is R-squared 0.5154 and adjusted R-square is 0.4946. which implies the model is good fitted and there is a dependency on these three variables where we get the significant level where women mobile use is significant at 0% level. Were women tobacco use being inversely related but it is also significant at the level 0.001%. And women bank account is also significant at the level 0.05%.

So, both this method suggest that the three variables are also significant and more appropriate and dependency on the women overweight.

Conclusion

In conclusion it is says that worse effect of malnutrition in both factors tolerates of our country, one is underweighted and overweighted. Maximum over weight is the tendency of obesity. Obesity is one of the awful complications in modern times. India is a country where income inequality and nutrition disparity are going on simultaneously. And data also illustrate that urban people are more suffer this problem than rural. The main reason is the income inequality in Urban rural. Income is one of the most significant factors for intensified obesity. Here bank account holder is one of the proxy indicators of the overweight. This model also satisfies the other two variables which are using mobile phones and addiction of tobacco. Mobile phone is a proxy indicator of lethargy. So, everybody should attention to more exercise, which reduces overweight.

Thehigher-income group spent their money more on the fat-rich products than essential products. And higher-income groups want more leisure than work. That is why private school students are suffering more obesity than public school. Most of the students in private schools are the portion of higher-income groups₄.(Jagadesan, et al. (2014)¹³.Obesity is the origin of other diseases likeheart disease, stroke, high blood pressure, diabetes and more, etc. So, Dilly Exercise and diet control are the way to reduce obesity in recent time.Diet nutrition should reduce the extra weight gain BA Swinburn (2004)¹⁴.

Sometimes people with depression can be low rate of consumption, which may lead to malnutrition. The over-nutrition strain on the heart, lungs, liver, weakened immunity; and psychological effects such as unhappiness. Saunders J (2010). ¹⁵India is a country where obesity and malnutrition are a double burden in the context of abnormal nutrition.

Various research studies saythat various diseases will come from the overweight such as cloudy urine, Increased frequency and amount of urination, Heartbeat misdeeds, Eye irritation to light, dry lips. If you have these types of experiencing these symptoms or others that concern you, discuss them with a

healthcare provider for a diagnosis and treatment. Obesity mainly depends food availability and tension free mind these are possible if the income of the people increases. Secondly without exercise which also intensify the obesity. Now a days the mobile phone is more essential of every live but over use of mobile phone is creates the disease like obesity.

Recommendations

From this paper will recommend for some specific development should prohibit big disaster which are as follows:

- Income is a one of the important factors which intensify the obesity. Urban sector is much higher than the rural sector. Because, Job availability of urban sector. As a result of the standard of living of urban sector is more than rural sector. Increase in income should increase exercise.
- Using capital intensive good is the one of the main causes of obesity. That implies people in
 urban area are use of capital intensive good more than labor intensive good. For example, Lift,
 washing machine, mixer machine, Motor cycle, car etc. are use more. If not, necessary people
 should prohibit such capital intensive good.
- Food habits of the urban people are more over-weighted than the rural. Habit of fast food will increase the overweight. These fast-food centers are larger growth in urban sectors than in the rural sectors. The peoples are revealing prefer to the fast-food than homemade food because they are bored to eat homemade food (Kaushik JS, Narang M, Parakh 2015)¹². Food habits should be changed it is dangerous for overweighted people.
- In recent time without time management people will not developed. For time managing Peoplewill take the help of the machinery items these are computer, car, two-wheeler, Smart mobile phone etc. every body knows that health is wealth. So, for healthy life people should increase the exercise, prohibit fast-food habit, and also use labour intensive good.

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Appendix

Table-1, shows the state wise percentage of women overweight, percentage of women mobile phone, women use tobacco, percentage of women bank account. (Rural & Urban)

States/UTs	Area			Women_tobaco	
ndia(Urban)	Urban	33.24		5.44	80.9
ndia(Rural)	Rural	19.68	46.61	10.49	77.4
Andaman & Nicobar Islands(Urban)	Urban	41.72	80.79	14.95	88.4
ndaman & Nicobar Islands(Rural)	Rural	35.71	80.86	41.06	89.7
Andhra Pradesh(Urban)	Urban	44.37	67.41	1.91	86.7
andhra Pradesh(Rural)	Rural	32.57	40.93	4.68	79.6
runachal Pradesh(Urban)	Urban	28.91		14.01	85.9
Arunachal Pradesh(Rural)	Rural	22.87	75.28	19.67	76.7
	Urban	23.83		16.22	
ssam(Urban)					81.8
Assam(Rural)	Rural	13.63		23.18	77.8
Bihar(Urban)	Urban	25.16		3.58	79.1
ihar(Rural)	Rural	14.16	49.26	5.25	76.2
Chandigarh(Urban)	Urban	43.91	70	0.57	87
Chandigarh(Rural)	Rural	19.68	46.61	0.01	77.
Chhattisgarh(Urban)	Urban	23.14	61.17	9.39	77.9
Chhattisgarh(Rural)	Rural	11.25		19.63	81.:
Dadra and Nagar Haveli & Daman and Diu(Urban)	Urban	34.04		2.39	78.
Dadra and Nagar Haveli & Daman and Diu(Rural)				3.32	
	Rural	20.31			89.
Goa(Urban)	Urban	38.11		2.42	85.
Goa(Rural)	Rural	33.12	87.06	2.83	92.
Gujarat(Urban)	Urban	30.44	66.04	5.39	73.
Gujarat(Rural)	Rural	17.01	36.18	10.96	67.
laryana(Urban)	Urban	37.46	65.11	1.66	76.
laryana(Rural)	Rural	30.85		2.98	72.
Himachal Pradesh(Urban)	Urban	38.31	90.86	1.22	88.
Himachal Pradesh(Rural)	Rural	29.24		1.72	82.
ammu & Kashmir(Urban)	Urban	33.36		1.81	88
ammu & Kashmir(Rural)	Rural	27.88		4.23	83.
harkhand(Urban)	Urban	21.59	65.2	4.81	79.
harkhand(Rural)	Rural	8.61	43.67	9.58	79.
(arnataka(Urban)	Urban	37.05	74.2	4.58	90
(arnataka(Rural)	Rural	25.59	53.42	11.1	87.0
(erala(Urban)	Urban	40.41	86.2	1.3	78.
Kerala(Rural)				2.97	
` '	Rural	36.03			78.
.adakh(Urban)	Urban	28.48		3.47	87.
.adakh(Rural)	Rural	28.19		3.08	88.
.akshadweep(Urban)	Urban	34.23	85.08	16.6	66.
.akshadweep(Rural)	Rural	31.04	80.09	21.09	66.9
Madhya Pradesh(Urban)	Urban	25.98	58.8	6.48	78.
Madhya Pradesh(Rural)	Rural	13.04		11.63	73.3
Maharastra(Urban)	Urban	29.58		6.63	74.9
	Rural				
Maharastra(Rural)		18.29		14.67	70.9
Manipur(Urban)	Urban	38.95		37.74	78
Manipur(Rural)	Rural	30.98	68.19	46.56	70.
Meghalaya(Urban)	Urban	17.85	78.24	27.2	77.9
Meghalaya(Rural)	Rural	9.73	64.29	28.52	68.2
Vizoram(Urban)	Urban	29.74	91.83	56.59	85.4
/lizoram(Rural)	Rural	16.92		68.52	74.
	Urban	17.13		16	77.
Nagaland(Urban)					
Nagaland(Rural)	Rural	12.97		12.59	55.4
NCT of Delhi(Urban)	Urban	41.24		2.19	72.
NCT of Delhi(rural)	rural	44.58		3.42	84.
Odisha(Urban)	Urban	40.09	58.82	16.63	82.
Odisha(Rural)	Rural	19.2	47.95	27.95	87.
Puducherry(Urban)	Urban	47.62	85.54	1.2	90.
Puducherry(Rural)	Rural	43.17	76.56	5.61	96.
Punjab(Urban)	Urban	44.28		0.5	80.
· · · · · · · · · · · · · · · · · · ·				0.34	82
Punjab(Rural)	Rural	38.83			
Rajasthan(Urban)	Urban	20.58		5.92	81.
Rajasthan(Rural)	Rural	10.45			
ikkim(Urban)	Urban	40.97			75.
iikkim(Rural)	Rural	30.75	83.25	14.14	76
amil Nadu(Urban)	Urban	46.08			92.
āmil Nadu(Rural)	Rural	35.41			91.
elangana(Urban)	Urban	41.7			82.
elangana(Rural)	Rural	23.83			85.
ripura(Urban)	Urban	29.16			74
ripura(Rural)	Rural	18.44			77.
Jttar Pradesh(Urban)	Urban	30.59	59.93	6.45	79.
Jttar Pradesh(Rural)	Rural	18.34	42.37	9.07	74.
Jttarakhand(Urban)	Urban	39.09			81.
	Rural	25.41			79.
Jttarakhand(Rural)					
Vest Bengal(Urban)	Urban	27.85			82
West Bengal(Rural)	Rural	20.26	39.07	12.25	73.

Table 2: Ordinary Least Square Method. (Simple Regression)

Model VCE Expression	: OLS : Linear process: wo_bank_ac					per of obs =	7
	dy/d		a-method	z	P> z	[95% Conf.	Interval
wo_bank_ac wo_mc women_tobac	.322445	1 .05	128492 552168 621692	2.88 5.84 -2.74	0.004 0.000 0.006	.1176234 .2142221 2924596	.621302 .430668 048760
egress wome	n_ow wo_ban	k acc	wo_mob	women to	obaco		
Source	ss	df	М	_		Number of obs	
Source Model Residual	SS 3713.50069 3840.48649	3	1237.8 54.864	3356		F(3, 70) Prob > F R-squared	= 22.5 = 0.000 = 0.495
Model	3713.50069	3 70	1237.8	3356 0927		F(3, 70) Prob > F	= 22.5 = 0.000 = 0.495 = 0.465
Model Residual	3713.50069 3840.48649	3 70 73	1237.8 54.864 103.47	3356 0927	P> t	F(3, 70) Prob > F R-squared Adj R-squared	= 22.5 = 0.000 = 0.493 = 0.465 = 7.40

Table 3: Shows the Weighted Least Square Method