RESEARCH ARTICLE

MEASURING REPRODUCTIVE HEALTH: A STUDY OF COMMUNITY-BASED INDICATORS TO ASSESSING MORBIDITY

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ARTICLE INFO	ABSTRACT
	A signifying step towards the identification of morbidity at community level need an interview-based diagnosis, several frame works, standardized scale and instrument focus on reproductive health. More recently, both biological and socio-economic landmarks bracketing the morbidity status of adulthood have moved in opposite directions. **Objective:** 1. To assesses the underweight and obesity of the subjects on the basis of their anthropometric measurements. 2. To elicit anemia by using biochemical parameters. 3. To find out the level of self-esteem, anxiety and depression among women. **Methodology:** The study conducted in urban area of Varanasi city. The approaches adopted for the study was cross-sectional one. For these study 310 women belonging to reproductive age groups (15 to 49 years) except more than four months pregnant women (i.e. excluded from the study) was selected from four Mohall's of Varanasi city by adopting multistage random sampling procedure. The tools in the study were pre-designed and pre-tested schedule comprising of family and individual schedule for measuring the anthropometric measuring and biochemical estimation. Self esteem, Anxiety and depression level was assessed by questionnaire method using pre-designed and pre-tested inventory. **Result:** under nutrition in women (15-49 years) of age has been higher (i.e. 71.5%) than the present study In this study prevalence of obesity was 1.29% and 7.42% using previous WHO criteria and proposed asian criteria, respectively The study has shown that psychological morbidity on the criteria of scale of self esteem, anxiety state-trait and depression were 31.94%, 32.58%, 30.65% and 20.97%, respectively. Majority of women 54.52% had normal in all psychological parameter and 0.32% showed abnormal psychological status in all psychological parameter.

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INTRODUCTION

Recent efforts to measure reproductive morbidity in developing countries stem from a broader effort to complement mortality indicators or hospital-based studies with measures of acute and chronic morbidity. Signifying one step towards the identification of morbidity at community level need an interview-based diagnosis, several frame works, standardized scale and instrument focus on reproductive health. A WHO working group defined reproductive morbidity "as any morbidity or dysfunction of the reproductive tract, or any morbidity which is a consequence of reproductive behavior including pregnancy, abortion, child birth or sexual behavior [and] may include those of a psychological nature. An internationally agreed conceptual definition of reproductive health is applied to the development and testing of practical indicators for use in the community.

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Basic criteria are proposed for an interview-based tool to measure reproductive health -- as opposed to morbidity or mortality -- adapting methods from the health status measurement field. Proposed domains and indicators linked to the definition of reproductive health. Anthropometry predominates over other methods of health assessment and it still considered the most practical and useful means for the assessment of underweight and obesity of the population. For long time we used to referred W.H.O. criteria for evaluation of B.M.I. However, after several years result showed that this was right for developed country. In India, women are noticed to be worst suffers i.e.57.1% suffering from CED (BMI < 18.5) while percent of normal and obese females were 36.3 and 6.6 respectively. The women's nutrition database comprises of approximately 1500 records, from 340 studies considered; four indicators of PEM of adult women viz: height, weight, and BMI and arm circumference. Each study was coded by five different sub grouping that included the following: Physiological status (pregnant, non-pregnant, and lactating),

age (usually reproductive age women, although adolescents and elderly women were also reported) location (urban, rural) country group / region. Parity and income group (low, middle, high).

The main problem related to the analysis of each outcome indicators is the varying cut-offs used different surveys. These indicators are:

Indicator	Cut-off to indicate problems
Height	< 145 cm. (stunting)
Weight	< 45 Kg. (under weight)
Body Mass Index	< 18.5 (wasting)
Mid-upper arm circumference	< 22.5 cm. (low arm circumference)

(Encyclopaedia of Health and Nutrition (3); 2002)

More recently, both biological and socio-economic landmarks bracketing the transition to adulthood have moved in opposite directions. In many countries the social environment - one of the most important components of health, is characterized by poverty, overcrowded, living conditions, unemployment, job insecurity and inequality, a grooming number of broken marriages, man-made as well as natural disasters. Women, researchers are especially exposing to these risks in developing country like India (WHO, 1996). On the basis of that review, the World Health Organization's Standard of BMI for Asian and Pacific Islanders is given below:

Classification of obesity	Body Mass Index (Kg/m^2)	
	Proposed Asian Criteria	Previous WHO criteria
Under weight	< 18.5	< 18.5
Normal weight	18.5 to < 23	18.5 to < 25
Overweight	23 to < 25	25 to < 30
Obese	≥ 25	≥ 30

(Source :WHO, 1998)

Body mass Index is a reasonable indication of the underweight and obesity of adults. The BMI has good correlation with fatness. It may also be use as indicator of health risk. The following classification has been suggested by James *et al* (1988):

MATERIAL AND METHODS

The study is conduct in four selected wards of Varanasi city, with the aim of delineating nutritional status as per B.M.I. of urban women. The field data collected were carried out for a period of one year 2002 to 2003.

The desired sample size for this cross -sectional study was computed by taking the prevalence of under nutrition as 56.68% and permissible level of error of 10%. The required sample size of 310women f reproduction age groups (i.e. 15 to 49 years) were considered as study subjects. As weight gain during pregnancy particularly 2nd and 3rd trimester may affect Body Mars Index, women had gestational period more than 4 months were exclude in the study. Multistage random sampling followed in the present investigation. Following stages were involved in arriving at the required sample size.

Stage 1: The authority of Banaras Corporation was contacted and the list of all wards including the names of Mohall's were obtained

Stage 2: There were altogether 90 wards in the city. Out of which 9 wards (i.e., 10 percent) were selected randomly using random table.

Stage 3: Out of previously mentioned 40 Mohall's, only 4 Mohall's (i.e., 10 percent) were taken randomly using random table.

Stage 4: Further, household selection was based on probability proportion to size as 310 households were to be selected from 1376, households in selected Mohall's were divided by 4.44 (i.e. 1376 / 310) to get the total number of selected households.

Stage 5: The survey was initiated in each selected Mohall. The first house selected randomly say 3rd house. Then, following the stratified sampling at the interval of 4, the next house was 3 + 4 = 7th house. This method was following continuously.

Stage 6: The study of selected household was taking for family information. In case of Joint / Extended family, only one family was selected through sample random techniques i.e., by lottery number.

Stage 7: Lastly, for individual information, a female between 15-49 years of age from each family was selected randomly (i.e. by lottery number) for their interview and detailed investigation.

Tools as a indicators for present study

Underweight and obesity

Weight ⎫
Height ⎬ Anthropometric measurement

Anaemia ⎫
Hemoglobinlevel ⎬ Biochemical estimation

Mental health
Anxiety The State ⎫ - Trait Anxiety Inventory (STAI)
 Depression ⎬ The Beck Depression Inventory (BDI)
Self -esteem ⎭ The Rosenberg Self-Esteem Questionnaire
(RSEQ)

Technique of the Study

Anthropometric measurements

Age

Most of the subjects were able to furnish the correct age. For the illiterate group, age was ascertained using life events like birth, death, marriage, school entry etc. i.e., a staircase approach.

Weight recording

Recording of weight of all study subjects was done with the help of weighing machine (Libra). All study subjects were weighted with minimum possible clothing and without footwear.

The machine was checked periodically by using standard known weight. According of the weighing machine was 100 g.

Height recording

The standing height was measured in cm, with steel anthropometric rod along the parallel bar. The steel anthropometric rod was placed on the even floor. For measurement, subject stands against the rod without foot wears. The bar was put at right angle on her head and the reading was noted. The accuracy of the steel anthropometric rod was 0.1 cm.

Biochemical Investigation

Hb estimation: Haemoglobin estimation of each study subject was done by the researcher using acid haematin (Sahle's) method (Sood, 1999).

The State - trait Anxiety Inventory (STAI)

The inventory provides reliable, relatively brief, self-report measure of state (A-state) and trait (A-Trait) anxiety (Spillberger, 1970). The Hindi STAI had developed by Sager Sharma and Mansukhbir, (1973) is essentially equivalent to the English form of the scale. The Hindi STAI (A-State) scale consists of 20 statements which ask people to respond according to 'how they feel at a particular movement in time'. The Hindi STAI (A-Trait) scale also consists of 20 statements which ask people to report 'how they generally feel'. Norms are available for adolescents, adults and neuropsychiatry patient.

Reliability: These correlations varied from 0.68 to 0.80 over periods ranging from 30 to 90 days.

Validity: The correlation between the Hindi and English STAI was 0.85.

Scoring: Each statement had 4 alternatives to describe the level of anxiety namely, Nil; Low; high and very high. These alternatives were assigned for the scores of 4, 3, 2, 1 in positive statements and 1, 2, 3, 4 in negative statements, respectively. The STAI have a direct interpretation: high scores on their respective scales mean more treat or state anxiety and low scores mean less.

The Beck Depression Inventory (BDI)

Beck and Beamesderfer (1974) described it as an inventory for measuring the depth of depression. This inventory measures cognitive, behavioural, affective and somatic aspects of depression. The BDI consist of 21 "symptoms-attitude categories. Reliability; The correlation between the two halves of the scale was 0.86 Beck *et al*. (1986) .A mean coefficient alpha was 0.86 for psychiatric patients and 0.81 for non-psychiatric respondents. Validity; It was 0.66. It has been used successfully in clinical and general population. It was also checked by self esteem scores and found significant at 0.01 level (r = 0.45).

Scoring: In the BDI, for each item there are four response categories. Each response category has a weighted score as 0, 1, 2 and 3, respectively.

The item scores are added to yield the total score. Minimum and maximum scores ranged from 0 to 63.

Interpretation of Beck Depression Inventory	
Total Score	Level of Depression*
1-10	There ups and downs are considered normal.
11-16	Mild mood disturbance.
17-20	Borderline depression.
21-30	Severe depression.
31-40	Extreme depression.
* A persistent score of 17 or above indicates subject need professional treatment.	

The Rosenberg Self-Esteem Questionnaire (RSEQ)

The Rosenberg Self-Esteem Questionnaire (Rosenberg, 1965) is an attempt to achieve one-dimensional measures of global self-esteem. All items are only related to the self-acceptance of self-esteem and not with any other. Reliability; High score on the test indicates low self-esteem, coefficient of test-retest reliability was found to be 0.80.Validity; The report of Rosenberg (1965) had constructed validity as positive self-esteem that was predictive of several social and psychological characteristics, such as reduced shyness, depression and more assertiveness and social activities. Scoring; Each statement had four alternatives strongly agree to strongly disagree. All alternatives of positive statements were given 4, 3, 2 and 1 scores and all alternatives of negative statements were given 1, 2, 3 and 4 scores, respectively. Therefore, the minimum and maximum possible score was 10 and 40, respectively. High total score indicates high self-esteem on this scale.

RESULTS AND DISCUSSION

Physical Health

Under weight and obesity

A analysis on women's health status indicators based on a database comprises of approximately 1500 records, from 340 studies to find out five indicators for health status, these includes; anaemia, and four indicators of PEM of adult women - Height, weight, BMI and arm circumference. Each study was coded by five different sub grouping that included the following, physiological status (pregnant, non-pregnant, lactating), age (usually reproductive age women) location (urban rural), country / region and income group. The following cut-offs were indicate (chapter-II) beside, these indicators assessed by anthropometric and biochemical methods. Subjects were not subjected to clinical examination in view of the fact that lot of subjectively involved in these methods.

Anthropometric measurement pre-dominant over other methods of nutritional assessment. Of various anthropometric measurements, weight and height are commonly techniques as per Jelliffee, (1966).These parameters are used to compute Body Mass Index (BMI) which has been considered as the most important indicator for assessment of underweight and obesity of adult population (Choudhary and Solanki, 1999; Charrian *et al*., 1988; Government of India, 1995; Mahanty *et al*., 1992; Parvarti and Sathiyanayaki, 1996; Rao, 1996; Ray D, 2002; Vijayragvan, 1987) Several classifications of health status using BMI have been proposed (Garrow, 1981; Rao,

1996; WHO, 1998) of these WHO (1998) classification is widely used and a different criteria for asian population has been proposed.

Table 1. Indicator as Body Mass Index (BMI) used for underweight and obesity identification

Body Mass Index (Kg/m^2)	Number	Percentage
According to Proposed Asian Criteria		
> 16	35	11.29
16-16.9	28	09.03
17-18.4	110	35.49
18.5-22.9	90	29.03
23-24.9	24	07.74
≥ 25	23	07.42
Total	310	100
Acco. to Precious WHO Criteria		
> 16	35	11.29
16-16.9	28	09.03
17-18.4	110	35.49
18.5-24.9	114	36.77
25-29.9	19	06.13
≥ 30	04	01.29
Total	310	100

Measuring health status of 310 women of reproductive age group of Varanasi city was assessed on the basis of Body Mass Index. The result are given in table1. As mush as 173 (55.81%) subjects were under nourished on (BMI< 18.5). Prevalence of similar finding have been reported in some of the studies conducted in the urban areas of Bihar(Singh and Yadav, 2000), Orissa (NHFS-2) and in out of five district of Uttar Pradesh (Nigam and Vir, 2001). However, in the urban area of Baharaich district of Uttar Pradesh extent of under nutrition in women (15-49 years) of age has been higher (i.e. 71.5%) than the present study.

In several, studies extent of under nutrition in women of reproductive age group had been lower (Egtesadi *et al.*, 2000; Krishnaswamy *et al.*, 1997; NFHS-II, 1999; Ray D, 2002). In three out of five districts of eastern U.P. women in the age group of 15-45 years had been BMI less than 18.5. It is obvious that the nutritional status of the women including in the study had been poorer than overall situation of urban area of eastern U.P. Wide variations of status of women on nutritional scale could be due to several factors viz; priory and care to acquire girl child in general and during adolescent particular fertility performance, socio-economic differential, psychological status. However, last fact was not considered by several studies. It is unfortunate that in spite of covering several programmes (MCH, ICDS, women development programmes) for health status of women in the study area is far from the being satisfactory. By using previous WHO criteria and proposed criteria 36.77% and 29.03% subjects were as normal, respectively.

Contrary to this Krishnaswamy *et al.* (1997); Singh and Yadav (2000), reported that 46.3% and 40.5% women as normal respectively. However, only one out of five women were considered as normal by Obesity is emerging important problems in urban women. In this study prevalence of obesity was 1.29% and 7.42% using previous WHO criteria and proposed asian criteria, respectively (Fig 4.2.1). Several studies (Coitinho, 1998; Egtesadi *et al.*, 2000; Krishnaswamy

et al., 1997; NFI, 2002; NFSH, 1998-99) have reported higher prevalence of obesity on the basis previous WHO criteria; figures ranging from 6.6%-38.3%. According to a study conducted in Varanasi city the prevalence of obesity in women has been 30.24%. However, this study was conducted on women belonging to afferent society. Hemoglobin level as indicators for anemia Nutritional anaemia has been considered as an important problem in women of reproductive age group, which is characterized by a low level of hemoglobin in the blood. Iron deficiency anaemia is the most wide spread malnutrition in the world, affecting more than two billion people.

Varying figures have been reported by prevalence of anaemia were by several worker as Lynch (2000); (Over 50%); Ray (2002) (65% pregnant, 57% non pregnant); showed similar finding with present study i.e. 58.05% among lactating women as well as womanhood and 63.28% among pregnant women. Majority of studies showed lower on lower on level of anaemia such as Seshadri (1998) 46% for urban women; and (50%) for pregnant women; Vijaylakshmi (2002) 47% for pregnant women; but few studies quoted that higher prevalence of anaemia among women there are reported by NNMB (2002) 78% non pregnant.

B: Mentalhealth

Level of Self-esteem, Anxiety and Depression among women

There are several ways for find out the magnitude of mental health problems like psychiatric case register in hospitals, case records of general practiioners and population surveys epidemiological studies involving cross-sectional surveys. These provided information about the magnitude and pattern of illness in the population which form the basis for planning of health care services. A large scale study of such nature involving multiple cultures in a defined time frame by trained investigators using a standardized screening tools, which is adopted for specific morbidity, Age, Sex and so on criteria and given by psycho-scientist.

The sampling techniques used in the present study in the interview-cum-questionnaire technique, where, tools are used for self-esteem (Rosenberg Self-esteem Questionnaire; RSEQ) Anxiety (State-Trait-Anxiety Inventory; STAI) and Depression (Beck Depression Inventory; BDI) for assessing their level in the study subjects. The wide variations in the prevalence rates in these type of studies may be due to difference in the case finding and scale forming techniques. In the table 4.4.1, data were analysed categorically as low, moderate and high and we founded that majority of them belonged to moderate category viz; 40.65% state anxiety, 50.64%, trait anxiety, 34.19%, self-esteem and 51.71% depression (Fig. 4.4.1).

The prevalence of psychiatric illness in the present study in terms of self-esteem, state anxiety, trait anxiety and depressionis given in Table 3. Magnitude of these psychological parameters were 29.35%, 15.16%, 16.45% and 16.80%, respectively by taking <25 to >75 percentile as abnormal psychological status and 25-50 to 51-75 percentile as normal psychological status.

Table 2. Hemoglobinlevel for identification of anemia

Physiological Group	Normal		Degree of Anaemia					
			Mild		Moderate		Severe	
Lactating Women + Womenhood	≥ 12		10-12		7-10		< 7	
(296)	No.	%	No.	%	No.	%	No.	%
	123	41.55	147	49.66	26	8.39	-	
Pregnant	≥ 11		10-11		7-10		< 7	
women	No.	%	No.	%	No.	%	No.	%
(14)	05	35.71	05	35.71	04	28.57	-	

Note: Characterization of Hb status was done as per WHO Criteria (1998).

Table 3. Psychological Status of study subjects based on their score categories

Parameter		Number (310)	Percentage
Score	Category		
State Anxiety			
20-39	Low anxiety	101	32.58
40-59	Moderate anxiety	126	40.65
60-80	High/Sever anxiety	83	26.77
Trait Anxiety			
20-39	Low anxiety	95	30.65
40-59	Moderate anxiety	157	50.64
60-80	High/Sever anxiety	58	18.71
Self Esteem			
10-19	Low	99	31.94
20-29	Moderate	106	34.19
30-40	High	105	33.87
Depression			
1-10	Normal	6	01.94
11-16	Mild	59	19.03
17-20	Borderline	86	27.74
21-30	Moderate	74	23.97
31-40	Severe	63	20.32
Over 40	Extreme	22	07.10

Table 4. Prevalence of Psychological parameters of the Study Subjects on the Basis of its Percentile

Parameter	Percentile							
	< 25		25-50		51-75		> 75	
	No.	%	No.	%	No.	%	No.	%
State anxiety	45	14.52	190	61.29	73	23.55	02	0.64
Trait anxiety	31	10.00	161	51.94	98	31.61	20	6.45
Self esteem	81	26.13	196	63.23	23	07.42	10	3.22
Depression	20	6.45	146	47.10	115	37.10	29	9.35

Note: <25 and >75 percentile; showed Abnormal psychological status,
25-50 and 51-75 percentile; showed Normal psychological status

Table 4. Mean scores of the Total Samples (n = 310) on Various Depression, Self Esteem and Anxiety Scale Inventory

Scale	Range	Mean	Standard Deviation
BDI	0-63	10.34	9.07
STAI-S	20-80	47.51	14.77
STAI-I	20-80	46.06	13.60
RBSEQ	10-40	25.06	07.81

Table 5. Psychological Condition / Status of Reproductive Age Group Women

Psychological State	No.	%
A. NormalState		
1. BDI + STAI-S + STAI-I + RBSEQ	169	54.52
B. Abnormal State		
1. BDI	49	15.81
2. STAI-S	47	15.16
3. STAI-T	51	16.45
4. RBSEQ	91	29.35
5. BDI + STAI-S	06	01.94
6. BDI + STAI-T	08	02.58
7. BDI + RBSEQ	14	04.52
8. STAI-S + STAI-T	34	10.97
9. STAI-S + RBSEQ	09	02.90
10. STAI-T + RBSEQ	14	04.52
11. BDI + STAI-S + STAI-I + RBSEQ	01	00.32
12. STAI-S + STAI-I + RBSEQ	08	02.58
13. STAI-I + RBSEQ + BDI	02	00.65
14. STAI-S + STAI-T + BDI	05	01.61

High prevalence of anxiety and depression have been reported by several workers. Zajecka, 1997 reported anxiety level of 24.9%. According to world bank (1993) anxiety has been to the extent of 87% in menopausal women. Eure, (2002) and Agrawal, (2000) reported depression to the extent of 20% and 36.5%, respectively. Other workers reported lower prevalence of psychological abnormality than the figures obtain in this study. Depression varied from 5% to 15% in different studies.

According to Bricklin and Sharan (1992), Lean *et al*. (1993), Sharma, (2002),depression to the extent of 5%, 6.4%,10% and 9.5%respectively.According to a leading news paper depression has been to the extent of 15% (The times of India, 2000). Anxiety levels ranged from 6.7% to 12.3% in different studiesSethi, (1967); Verghese, (1973); Nandi, (1980); Premarajan, (1993); World Bank, (1993). As we focused specifically on scale used in the present study such as BDI, STAI-S, STAI-T and RBSEQ have been ranges of scores were 0-63, 20-80, 20-80 and 10-40, respectively i.e. minimum to maximum marks obtained by the study subjects.

Further, estimated mean of 310 study subjects we founded on an average score of Depression, State anxiety, trait anxiety and self-esteems were 10.34±9.07, 47.51±14.77, 46.06±13.60 and 25.06±07.81; correspondingly (Table 4.4.3). Changes in diagnostic criteria affect on the prevalence of psychological illness/morbidity are comparable all these four scales (viz; BDI, STAI-S, STAI-T and RBSEQ) as interchangeable combination with each other and we formed two states: Normal as well as abnormal psychological condition in the present study. Life time prevalence showed more than (54.52%) study subjects were normal in all these four parameters and only 00.32% had abnormal state in all four psychological morbidity condition (Table 4.4.4).

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