

Prevalence of Obesity among Women Aged 45-55 Years Living in Milima Sub Location of Bungoma North District in Kenya

Juliet Wafula

Academic Model for the Prevention and Treatment of HIV (AMPATH)

julixy2001@yahoo.com

Abstract

The period of 45-55 years of age signifies the menopause transition (climacteric). This is one of the stages in a woman's life where overweight and onset of obesity are favored. There are few studies on Nutritional Status of menopausal women in several parts of the world including Kenya in relation to prevalence of obesity. The aim of this study was to determine the prevalence of obesity among women aged 45-55 years from Milima Sub location of Bungoma North District. This was a cross sectional study. Two hundred and twenty participants consented to participate in the study. The data was collected using anthropometric measurements where, height, waist and hip circumference and mid upper arm muscle circumference were taken using a non-stretchable tape measure to the nearest one centimeter. A skin fold caliper was used to measure triceps and biceps skin fold (SF). Weight and height were measured using a weighing scale, and a height board, respectively. Nutritional status was based on Body Mass Index (BMI) determined as (weight (Kg)/Height (m²)), waist to hip ratio (WHR) and percentage of body fat. Results showed that the mean age $\pm$ (SD), waist to hip ratio (WHR), Body mass index (BMI) and mid upper arm circumference (MUAC) of the respondents were 49.6 ± 3 , 0.88 ± 0.8 , 24.67 ± 6.7 and 29.98 ± 5.4 , respectively. The number of women considered obese (BMI > 30) and underweight (BMI < 18) was (19.1%) and (18.6%) respectively. Based on waist to hip ratio (WHR) and % of body fat 36.4% and 73.9% of the study participants were found to be obese (WHR > 0.9 and (percentage of body fat $\geq$ 38%,) respectively. It was concluded that the majority of the women aged 45-55 in Milima sub location are over nourished. The women aged 45-55 years in Milima sub location should be enlightened on weight management so as to reduce the high prevalence of obesity.

Key Words: Obesity, Weight Managment, Climatectric, Bungoma

INTRODUCTION

Obesity is one of the most common disorders in climacteric women and occurs in approximately 65% of them (Paszowski, 2007). The world estimates for climacteric age is 45-55 years (Biri *et al.*, 2005; Ku *et al.*, 2004; Meschia *et al.*, 2000; Mohammadm *et al.*, 2004; Syamala & Sivakami, 2005). In the United Kingdom the prevalence of overweight and obesity among postmenopausal women has been reported as 41% (24/59) and 36% (21/59) respectively whereas less than half of the premenopausal women (48.27%, 14/29) were observed as overweight and obese (Begum, 2009).

Obesity in climacteric women is a public health problem because studies carried out in other parts of the globe have also established a high prevalence among menopausal women. Studies by Kanthapitcha (2008) on the –Nutritional Status, Food Consumption

and Health Practice of Menopausal Women Attending Menopause Clinic, Srinagarind Hospital, Khon Kaen University indicated that 69.4% of menopausal women at the age bracket of 55-59 years had overweight nutritional status and obese; and at risk status of obesity at 41.3% and 25.6% respectively.

The findings of the study in Ho Chi Minh City, to determine the nutritional status of middle aged Vietnamese women showed that about 35% of the low-income population suffered from under nutrition and 18% of the high-income population from over nutrition (Tran Thi Minh Hanh, 2001). Garaulet *et al.* (1997), in the City University of New York, conducted a research on body fat distribution in menopausal women and found out that body fat distribution changes with menopausal status with abdominal obesity more pronounced in postmenopausal women.

Perry *et al.* (1997) compared the anthropometric measures of fat distribution in overweight pre (n = 115) and postmenopausal women (n = 46) aged 52.4 ± 0.3 of Miami and found the following results. Post-menopausal women had significantly higher mean values for fat distribution viz., WHR (0.90 ± 0.09 vs. 0.85 ± 0.08) and waist circumference (114.50 ± 15.2 vs. 104.57 ± 16.3 cm) than pre-menopausal women, which is a risk factor for cardiovascular diseases.

A study on Menopausal transition and changes in body composition: a prospective study in 438 Chinese perimenopausal aged 44–55 years in Hong Kong (S C Ho, 2010) reported a slight decrease in the lean mass but an increase in the total fat mass and trunk fat mass (TFM) over the follow-up period. The longitudinal study showed that menopause has an independent effect on an increase in fat mass, and an increase in central obesity in perimenopausal Chinese women.

The numbers of menopausal women, including those just entering and those just ending menopause, is increasing. As per the statement made on the international Day of menopause on 18th October, 2008–

Some effects of menopause may have may be implicated in more serious age-related diseases like heart conditions and osteoporosis. Many women may live one-third of their lives post-menopause, some at high risk for some of these diseases (Kiel *et al.*, 2001).

The above chronic diseases are present in Kenya hence their prevention becomes our primary goal especially when the management of chronic diseases is difficult due to scarce resources as Kenya is among the developing countries. Post-menopausal women deserve greater nutritional protection as they continue to participate in the labour force, and because appropriate measures could prevent debility due to chronic diseases. From the Bungoma District Strategic Plan of 2005-2010, lack of adequate knowledge on pre and postmenopausal care has been mentioned as a reproductive health issue.

There is no published literature regarding the Nutritional status of menopausal women in Kenya. The authors therefore, sought to assess the prevalence of obesity among menopausal women in one of the rural sub locations (Milima) of Kenya using anthropometric measurements (body mass index, percentage of body fat and waist to hip ratio). The findings of this study would provide useful information for policy makers to

make any nutritional intervention to improve the nutritional status of women aged between 45-55 years and also act as baseline data for other nutritional studies on menopausal women in Kenya

MATERIALS AND METHODS

This study was carried out in Bungoma North District which is one of the seventeen districts that form Western Province. It lies at the northern tip of Western Province and borders TransNzoia district to the north, Lugari district to the east all the way to the south, Bungoma East district to the southwest and Bungoma West district to the northwest. It covers an area of 357.1Km². The estimated total number of poor (people who cannot afford a decent meal daily) in Bungoma North District is 52 per cent. Settlement patterns in the District are sparsely distributed with bigger farm sizes with 484 people per square kilometer. However, this population density was expected to be 547 in the year 2010 and 560 in 2012 respectively (Bungoma District Strategic Plan for 2005 - 2010).

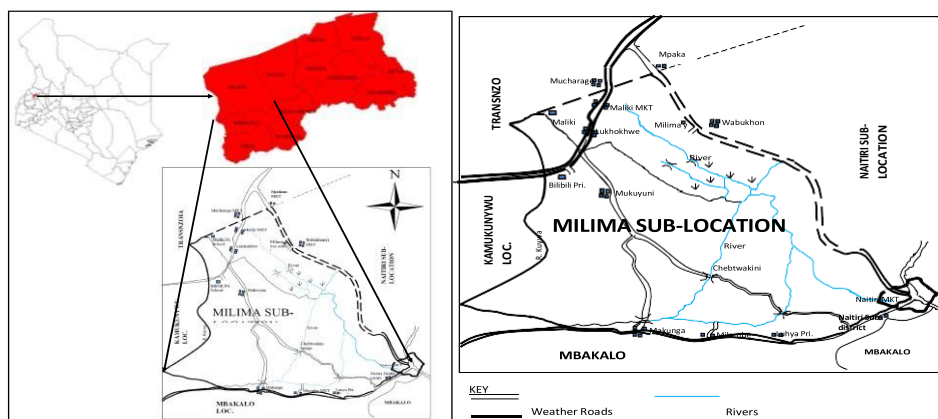


Figure 1. Adminstrative map of Milima Sublocation of Bungoma County

The district has one sub district hospital and one health Centre of which the health Centre is in Milima Sublocation. The economy of Bungoma County is mainly agricultural small scale peasantry, centering on maize industries. Other crops grown in these areas include maize, potatoes, millet, beans, bananas, cassava, a variety of fruits and vegetables, sugar cane, sunflower, coffee, tea, oil palm and pyrethrum. The area especially in the higher elevations is also highly suited for dairy production. The area experiences high rainfall throughout the year. The main cash crop is maize and is also the staple food, (Bungoma north District development plan 2008 – 2012).

The total population of the Bungoma County before subdivision was estimated to be 1.4 million people. This large population coupled with rural unemployment has started to put pressure on land and other natural resources, (Bungoma District Strategic Plan for 2005 - 2010).

The study design used was a Cross-sectional descriptive study. The target population was women aged 45-55 years in Milima sub location of Bungoma North District. All the women recruited into the study who were aged 45-55 years fell in the inclusion criteria and were living in Milima sub location of Bungoma North District. The number that consented to be interviewed were 220. The author recruited all women aged 45-55 years living in Milima sub location and consented to be interviewed. The author was to exclude women aged 45-55 years living in Milima Sub location and who were physically disabled, mentally challenged or bed ridden. The author did not find such women in the field.

The anthropometric measurements were carried out whereby weight was taken using electronic bathroom scale (UNISCALE) to the nearest 100 gm.; the waist, hip, and MUAC were measured using a tape measure to the nearest one centimeter. Height measurements were taken using a height board to the nearest one centimeter. The Waist circumference was taken at a level midway between the lower rib margin and iliac crest with the tape all around the body in horizontal position. The skin fold measurements (biceps and triceps) were taken using the skin fold calipers. Triceps skin fold measurements were taken at the mid way between the acromion process of the shoulder and the tip of the olecranon process of the ulna. The biceps measurements were taken at the front of the upper left arm directly above the center of the cubital fossa, one superior to the mark for the triceps skin fold vertical grasp at the marked level. Mid upper arm muscle circumference was taken in between elbow (acromion) and the shoulder (olecranon) on the left hand to the nearest 0.1cm. The hand was relaxed and hanging down the body.

The derived anthropometric measurements computed included the waist to hip ratio which was then calculated using waist measurements divided by and hip measurements. Body Mass Index (BMI) which was calculated using height and weight measurements (Kg/M^2), and the percentage of body fat which was derived using the formula

$$(0.232 \times \text{waist (cm)} \times 0.657 \text{triceps (mm)} + 0.215 \text{ age (years)} - 5.5)$$

Mid upper arm muscle area was also derived based on the formula

$$\frac{\{\text{MUAC (cm)} - \pi \times \text{TSF (cm)}\}^2}{4 \pi} - 6.5$$

Where

$\pi = 3.14$,
 MUAC = Mid upper arm Circumference,
 TSF = Triceps skin fold measurement.

Average values are $30 \pm 7 \text{cm}^2$

The mid upper arm muscle area of less than 36% of average values is indicative of possible depletion of lean body fat, (Rosalind, 1999)

SPSS 16.0 software was used for statistical analysis.

RESULTS

The results of the research that was done from March 2008 to August 2008 were as follows.

Table 1. Social demographic characteristics of women aged 45-55 years of Milima Sub location

Status	Characteristic	No	(%)
Marital status	Married	180	(81.8%)
	Other (Separated Widowed)	40	(18.2%)
Education level	Primary	98	(44.5%)
	Secondary	50	(22.7%)
	College	72	(32.7%)
Employment	Employed	52	(23.6%)
	Self employed	143	(65%)
	Unemployed	25	(11.4%)

A total sample of 220 women aged 45-55 years was studied. Their mean age was 49.6 ± 3 years. Majority (180 or 81.8%) were married and only 72 (32.7%) had college education. One hundred and forty three (65%) were self employed as shown in Table 1.

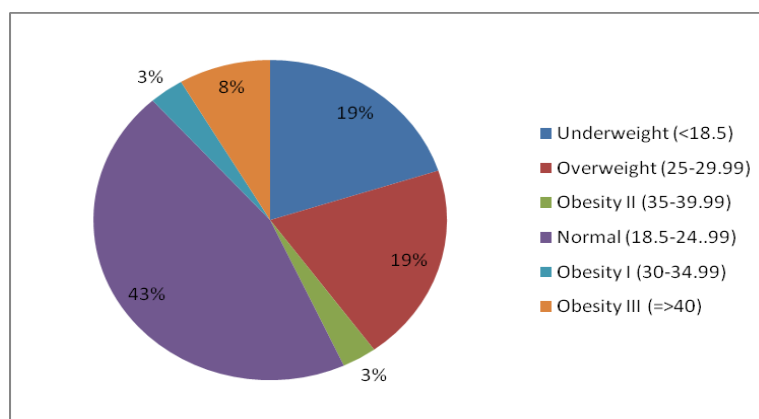


Figure 2. Nutritional status of the women aged 45-55 years in Milima sub location based on body mass index

Figure 2 shows the nutritional status of women aged 45-55 years living in Milima sub location using Body Mass Index (BMI) anthropometric measurements. The studied population had a mean $\pm$ SD BMI of 24.67 ± 7.8 . A total of 42 (19%) of the study participants were obese. The prevalence of underweight was 19%. Eight percent of the study participants fell in the category of obese III.

Table 2. Nutritional status based on Waist to Hip Ratio

Classification	Frequency	Percent (%)
Under nutrition (< 0.80)	38	17.3
Normal (0.81-0.84)	44	20
At risk Group (>0.85)	138	62.7
Total	220	100

According to table 3, a total of 138 (62.7 %) of the study participants had their waist to hip ratio (WHR) greater than 0.85 and therefore were considered to be obese. The mean $\pm$ SD of WHR was 0.87 ± 0.071 .

Table 3. Classification of body compositions based on percentage of body

Percentage of body fat Classification	Frequency (No of participants in each classification)	Percentage of Body fat
Low fat store (<25)%	9	4.1 %
Acceptable (25-38)%	47	21.4 %
High Fat store >38)%	164	74.5 %
Total	220	100

Seventy four point five percent of the study participants had their percentage of body fat greater than 38 and therefore were considered to be obese.

Table 4. Body compositions based on mid upper arm circumference, mid upper arm muscle mass and percentage body fat

Body Composition	N	Minimum	Maximum	Mean	Standard deviation
Mid upper arm muscle area		8.61 cm ²	109.50	20.46	9.71
Percentage Body fat	220	23..34 %	79.50 %	38.46 %	11.03 %
Mid upper arm circumference		10.50 cm	70.00 cm	29.75 cm	5.87 cm

The results body composition showed that the mean mid upper arm muscle area, and percentage body fat was 20.46 ± 9.7 , 38.5 ± 11.03 respectively. The mean mid upper arm circumference (MUAC) was 29.98 ± 5.87 with 96.4% of the women with a MUAC >22cm.

DISCUSSIONS

In the study, the prevalence of obesity was 19% based on Body mass index anthropometric measurements among the women aged 45-55 years in Milima sub location. The prevalence slightly more compared to Vietnamese women population who were (13%) overweight (Tran Thi Minh Hanh, 2001). As women age, the risk of developing chronic disease increases. Women over age forty-five who are overweight, physically inactive, and have a family history of diabetes are more likely to develop type 2 diabetes. Maintaining a healthy weight, eating a varied and balanced diet, and engaging in an active lifestyle can reduce the risk of developing type 2 diabetes (WHO, 2002).

Diabetes carries many risks with it, including eye disease, nerve disease, kidney disease, and heart disease (WHO, 2002).

It was found that 62.8% of the study participants in the Milima study had high-risk waist to hip ratio. The mean WHR was high (0.87 ± 0.071). Similar results were reported by (Karnataka, 2008). High risk waist to hip ratio signifies abdominal obesity. A research done by Garaulet *et al.* (1997), in the City University of New York, found that Body fat distribution changes with menopausal status with abdominal obesity more pronounced in postmenopausal women. Abdominal obesity is associated with coronary heart diseases, Diabetes mellitus and Hypertension.

The results of body composition indicated that the mean, body fat percentage was 38.5 ± 11.03 , indicating a high fat store. 74.5% of the studied participants were obese. The mean mid upper arm circumference (MUAC) was 29.98 ± 5.87 with 96.4% of the women with a MUAC >22 cm hence only 3.6% had depleted muscle mass. A study on Menopausal transition and changes of body composition: a Hong Kong (S C Ho 2010) reported that menopause has an independent effect on an increase in fat mass, and an increase in central obesity in perimenopausal Chinese women.

CONCLUSIONS

The findings suggest that the majority of women aged 45-55 years and living in Milima sub location are obese when assessed using body mass index, waist to hip ratio and percentage of body fat was calculated.

RECOMMENDATIONS

The women aged 45-55 years in Milima sub location should be enlightened on weight management so as to reduce the high prevalence of obesity.

REFERENCES

- Akhvan-Tiab A, *et al.* (2003). Healthy heart project. Prevalence of obesity in central part of Iran. *J Gazvin Univ of Med Sci* 2003; 26: 27–35.
- Azadbakht, L., Mirmiran, P., & Azizi, F. (2004), Prevalence and associates of obesity in Tehranian adults. Tehran Lipid Glucose Study. *Int J Endocrinol Metab* 5(Suppl.): abstract.).
- Bahrain, Musaiger, A.O, & Al-Mannai, M.A. (2001), Weight, height, body mass index and prevalence of obesity among the adult population in Bahrain. *Ann Hum Biol* 28, 346–350.
- Colditz, G.A., *et al.* (1987). Menopause and the risk of coronary heart disease in women. *N Engl J Med*; 316, 1105-10.
- De Paz, I.P., Hernando, C.A., & Roldán, J.O. (2006), Obesity and menopause. *Nutr Hosp*, 21(6), 633-637.
- Folsom *et al.* (1993). Body fat distribution and 5-year risk of death in older women. *JAMA*; 269, 483-7.
- Garaulet, *et al.* (1997). Body fat distribution in pre-and post-menopausal women: Metabolic and anthropometric variables: *The Journal of nutrition, health & aging* ISSN 1279-7707 Springer, Paris, FRANCE
- Guthrie, J., Dennerstein, L., & Dudley, E. (1999). *Weight gain and the menopause: A 5 year prospective study of a population based cohort. Climacteric*, 2, 205-211.

- Hajian-Tilaki, K. O., & Heidari, B. (2006). Prevalence of obesity, central obesity and the associated factors in urban population aged 20–70 years, in the north of Iran: a population-based study and regression approach.
- Hassan, M.K., *et al.* (2003). Obesity and health-related quality of life: a cross-sectional analysis of the US population. *Int J Obes Relat Metab Disord*, 27, 1227–1232.
- Kabir, M., & Karim, A. (1984). Nutritional status and age at secondary sterility in rural Bangladesh. *J Biosoc Sci*; 17(4), 497-502.Pubmed.
- Kac, G., Velasquez- Melendez, G., & Coelho, M.A. (2001). Factors associated with abdominal obesity among childbearing-age women. *Res Saude Publica*; 35, 46–61).
- Lambrinoudak, I. *et al.* (2010). EMAS Position statement: managing obese in postmenopausal women *PubMed.Maturitas Jul*; 66(3), 323-6
- Leaf, D.A. (1990) .Women and coronary artery disease. Gender confers no immunity. *Postgrad Med*; 87, 55-60.
- Lofgren, I. (2004). Waist circumferences a better predictor than body mass index of coronary heart disease risk in overweight premenopausal women. *J Nutr*; 134, 1071-6.
- Manly. (2000). Endogenous estrogen levels and Alzheimer's disease among postmenopausal women. *Neurology*; 54, 833-7.
- Nemati, A., & Naghizadeh, B. A. (2008). Assessment of Nutritional status of Post Menopausal women of Ardebil, Iran, *Journal of Biological Sciences* 8(1), 196-200.
- Paszkwski, T., & Klodnicka, M. (2007). Hormonalna terapia zastepcza. *Przegl Menopausal*; 2, 106-109.
- Perry, C.A., *et al.* (1997). Relation between anthropometric measures of fat distribution and cardiovascular risk factors in overweight pre and post-menopausal women. *American Journal of Clinical Nutrition*, 66, 829-836.
- Sturm, R. (2003). Increases in clinically severe obesity in the United States, 1996–2000. *Arch Intern Med*; 163, 2146–2148.
- Sugiyama, M. (1997). Climacteric symptoms and nutritional status in Japanese Women. *Matutus*, 27, 199-199.
- Tapadar, S. (2004). Overweight, hypertension and ECG changes in menopausal women in West Bengal. *Indian Medical Association*, 102, 122-123.
- The world health report (2002) *Reducing risks, promoting healthy life*. Geneva: World Health Organization.
- Tran Thi Minh Hanh, *et al.* (2001). Nutritional Status of Middle-Aged Vietnamese in Ho Chi Minh City. *Journal of the American College of Nutrition*, 20(6), 616-622
- Venezuela, *et al.* (1997) .Obesity and developing countries of the South, *Med Trop* 57, 380–388.
- World Menopause Day (October 18, 2008). Retrieved from <http://www.gynob.com/world-menopause-day-2008.html>
- Kiel, D. P., Kauppila, L. I., Cupples, L. A., Hannan, M. T., O'Donnell, C. J., & Wilson, P. W. F. (2001). Bone loss and the progression of abdominal aortic calcification over a 25 year period: the Framingham Heart Study. *Calcified Tissue International*, 68(5), 271-276.

BIO-DATA

Juliet Wafula is a graduate of Moi University with a post graduate degree in Public Health (Nutrition) and a bachelor's degree in Education (Home Science and Technology). He currently works as a research Assistant for AMPATH Pediatric Patient Centered Intervention Disclosure Study. She has got an interest in ageing and Nutrition.