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MATERNAL SOCIO-ECONOMIC CHARACTERISTICS AND CALORIE INTAKE IN SOUTHERN NYANZA, KENYA

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ABSTRACT

Approximately 826 million people in the world are undernourished or chronically food insecure facing a shortfall in the energy requirement by between 100-400 kilocalories while 790 million people in developing countries subsist on diets that are deficient in energy. In Kenya 50% of the rural population is food insecure. Nyanza, Rift Valley and Eastern provinces contributed 66% of the total rural food poverty. Numerous socioeconomic and cultural factors influence the decision on patterns of feeding and nutritional status. In adequate kilocurie intake is often associated with iadequate intake of micronutrients. Malnutrition in women is not conspicuous and remains to a large extent unaccounted for and unreported, thus insufficient attention has been given to the extent, causes and consequences of malnutrition in women. As a result inadequate resources and efforts have been allocated to improving women's nutrition compared with other nutritional and public health actions.. This lack of emphasis on women's nutrition is unacceptable given the importance of nutrition to women's health, pregnancy outcome and child survival. This study thus sought to investigate maternal Socio-economic Factors and their influence on Kilocalorie intake, in South Nyanza, Kenya. Objectives of the study included determining socio-economic factors and determining Kilocalorie intake. The study adopted a descriptive survey and comprehensive sampling was used to select a sample of 100 women for the study. Data was collected by use of structured questionnaires for socioeconomic, factors and Kilocalorie intake was obtained by use of 24- hour recall and food weighing technique. Data was analyzed by use of Statistical Package for Social Sciences (SPSS version 9) and dietary data was analyzed by use of Nutri-survey computer package. Descriptive statistics was used to describe other data. Pearson's Product Moment Correlation Coefficient was used to test for significant relationships between variables and t test was used to test for significant difference between mean of nutrients. Daily Kilocalorie intake was found to be 1436.42 ± 421.8 std Kcal/ day. Women in this study consume fewer calories than what is recommended as adequate. The study found possible influence of socioeconomic variables on Kilocalorie intake. The study fills the knowledge gap,

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and is of benefit to future research work, various government departments, local and international agencies, the community and women. The government and health and nutrition organizations need to provide social and nutritional support to women in this region.

Keywords: SOCIO-ECONOMIC FACTORS, CALORIE INTAKE, WOMEN

INTRODUCTION

Seven hundred and forty million people in the world do not have enough to eat. The vast of hungry people (98%) live in developing countries, where almost 15% of the population is undernourished (FAO, 2012). Women make up a little over half of the world's population but they account for over 60% of the world's hungry (ECOSOC, 2007). Maternal nutrition is critical for both mother and child as it lays fundamental foundation for the successful outcome of pregnancy (Republic of Kenya, Ministry of Health, 2013).

Nyanza, Rift Valley and Eastern provinces contribute about 66% of the total rural food poverty (Barasa, 2006). The prevalence of chronic malnutrition is reflected in the high incidences of maternal deaths, increased risk of disease, and lower pregnancy weight gain. Low rates of gestational weight gain increase the risk of low birth weight infants and shorter gestations and from an international health perspective, birth weight is the most readily available index of pregnancy outcomes including intrauterine growth retardation, spontaneous abortion, fecundity and congenital abnormalities (Willis, 2003; Shaw, 2003).

A study recently done in East Africa's Lake Victoria region found that Kenyan women consume 1506 ± 533 kilocalories per day, only 15.6 % meet the recommended daily allowance (Waudo, kikafunda, Tuitoek, & Msuya, 2005). Pregnant women in this region may be at nutritional risk because of inadequate energy intake that may fail to meet the high-energy demands of their daily physical activity, and gestation. The specific objectives of the study were to investigate socio-economic and health factors of women and to determine the daily dietary energy intake of women.

METHODS

Research Design and Sampling

Descriptive design was used in the study. The study area was Rongo in Southern Nyanza of Kenya and the study targeted pregnant women who attended ante-natal clinic. Comprehensive sampling was used to identify pregnant women who consented to participate in the study as they arrived at the hospital. The study used 70% as a suitable representation and a further 10% in

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control of attrition to obtain a sample of 100 women. The study included pregnant women who suffered manageable chronic illnesses or who were on some form of medication and/or treatment but excluded those who did not give consent, those who were hospitalized or bedridden, who did not attend clinic and those who were resident in the locality for less than six months.

Data Collection Procedures

Data was collected using a semi structured questionnaire and direct observation. The instruments were piloted on 6% of the sample but who were not included in the study. They were then revised and standardized as per the piloting results. Permission to carry out research was granted by the Permanent Secretary Ministry of Education. Permission was also sought from the Medical Officer of Health Migori District and Project administration was sought from the Medical Officer in Charge at Rongo Sub-District Hospital. The nature of the study was explained to the women and informed verbal consent was obtained from them. Participation was purely voluntary. Confidentiality of data was maintained by coding the information obtained from techniques and were given work instructions on how exactly to perform the interview.

Researcher and assistants then visited the facility to obtain a sample of pregnant women. This was done daily for approximately 30 working days until the required sample size was obtained. Face-to-face interview was held to collect Socio-economic and dietary data in the hospital counselling room some of which were collected through observation. The sample for observation was obtained based on consent of the women who would also select a day that they would be present in their homes The women were given appointments to be visited at home exactly one week from the day of the recruitments. Each woman was given a code and details of how to reach them in their homes were recorded. A combination of 24-hour dietary recall and weighed food intake were used to measure food intake. A 24-hour recall was used to estimate the daily intakes of the women. The food and drink eaten by the woman the previous day were recalled by her as she was being interviewed by the researcher and assistants.

The intakes were recorded on 24 hour recall sheets which were coded for every woman. Quantities were estimated through the use of common household measures. The 24 hour recall interview schedules were repeated during the home visitation. Each woman had two 24-hour recall data which were used for analysis. Observers were later on present in the households of 10% of the respondents to carry out 2 days observations from 7.00 am to 6.00 pm.. A measure of household food preparation and consumption using a weighing scale for two days was also done for the same households. During observation days all foods were weighed before cooking on digital display scales and results rounded to the nearest gram. After the food was prepared but

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before it was served the whole dish was weighed. Ingredients of mixed dishes were weighed at the time of preparation and portions consumed by the woman were directly measured and recorded. The weight of any food left at the completion of the meal was deducted from the weight of the original serving. Snacks and other foods such as fruits consumed by the subject but not included in the main dish were also weighed and results recorded to the nearest gram. Foods prepared while the observer was absent were obtained by questioning and observing the woman. Data was collected between the periods of 2006 and 2009.

Data Analysis

Data for 100 pregnant women was available for analysis. Data were coded and analysed by use of Statistical Package for Social Sciences (SPSS). All weights of foods consumed by the subjects from 24 hour recall and weighing method were converted from household measures into grams and then into intake values for energy, protein, fat, iron, zinc, fibre and vitamin C by using Nutri-Survey package for windows. Local measuring utensils were identified and their weights and volumes determined by use of a variety of foods and beverages to ease analysis. An analysis of energy intake was stratified by socio-economic indicators such as age, education level, occupation, wealth index, main provider and main method of obtaining food. Women's socio-economic characteristics were analysed using frequencies and descriptive statistics. Paired t-test was used to test for significant relationships between the means of nutrient intakes from recall and weighed intakes at P < 0.05. Pearson's product moment correlation coefficient (r) was used to measure correlations between energy intakes, age, family size, occupation, morbidity at (P < 0.05).

RESULTS

Age (in years)	Frequency $(N = 98)$	Percent
≤19	35	36
20 - 24	31	32
25 – 29	17	17
30 - 34	07	07
35 - 39	05	05
40 - 44	02	02
\geq 45	01	01
Total	98	100

Table 1: Age distribution of the pregnant women

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Figure 1: Marital status of the pregnant women



Figure: 2: Highest education level of subjects and husbands

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Figure 3: Employment status of subjects and husbands

Table 2 Main source of food and main provider of food of the women's households.

Maternal Variable		Percentage
Main source of food	Production	85%
	Purchase	15%
Main provider of food	Both husband & woman	26%
	Husband	61%
	Other relatives	07%
	Parents	06%

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Nutrient/day	RDA	Recall	% RDA	P value t-	Observed	% of RDA
				lest	IIItakes	
Energy (Kcal)	2500	1436.42	57.55	0.201	1515.60	60.6
Protein (gm)	60	54.74	91.2	0.544	59.40	99.0
Fat(gm)	83374	38.6	21.5	0.624	38.20	46.0
CHO (gm)	27	237.00	63.4	0.835	247.44	66.2
Iron (mg)	100	13.35	49.	0.189	10.35	38.3
Vitamin C (g)	400	122.73	122	0.848	137.73	137.7
Folic acid (µ)	20	85.75	21.4	0.638	88.62	22.15
Zinc (mg)	30	9.02	45.0	0.732	10.30	51.5
Fibre (mg)		31.96	106	0.690	30.00	100.0

Table 3:	Nutrient	intake	of the	Women
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RDA-Recommended Daily Allowances- based on RDA as published by the Food and Nutrition Board of the National Research Council of National Academy of Sciences; source (Allen, 2001) CHO-Carbohydrates

Table 4:	Energy int	ake categor	ies by selec	cted maternal	variables

Maternal Variable	N	Energy intakes	Standard
		(Kcal/day)	deviation
Subjects' Education Level			
None	2	1721.95	343.01
Primary	72	1409.33	438.01
Some secondary	10	1362.81	254.61
Completed secondary	9	1517.53	385.76
Tertiary	7	1634.27	497.94
Total	100	1436.42	421.84
Husbands' Education Level			
Primary	45	1386.70	426.30
Some secondary	10	1479.92	287.86
Completed secondary	13	161665	465.06
Tertiary	10	1375.54	500.76
none	1	1602.00	429.67
total	87	1440.90	
Husbands' employment status			
Unemployed	19	1316.36	449.80
Casual	20	1380.80	363.13
Self- employed	25	1603.01	448.44
Wage earner	23	1419.83	419.36

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Total	87	1440.90	429.67
Subjects' Employment Status			
Unemployed	66	1424.52	360.82
Casual	3	2087.40	484.12
Self-employed	23	1451.01	533.77
Wage earner	8	1248.54	348.45
Total	100	1436.42	421.84
Main provider			
Both	26	1481.14	557.00
Husband	61	1427.82	373.55
Other relatives	7	1384.51	336.27
Parents	6	1390.69	379.98
Total	100	1436.42	421.84
Main method of obtaining food			
Self production	85	1424.56	415.93
Purchase	15	1503.62	463.34
Total	100	1436.42	421.84
Wealth Index			
Low	42	1382.10	444.45
Lower middle	17	1489.83	475.38
Medium low	36	1480.06	374.91
medium	5	1396.94	428.33
total	100	1436.42	421.84

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Variable	Energy Intake	Significance level (p
		value)
Age	-0.027	0.061
Family size	-0.031	0.052
Women's occupation	0.274*	0.045
Husbands' occupation	.0 117	0.053
Morbidity	0.061	0.056

Table 5: Pearson's Product Moment Correlations betweenEnergy Intake and Maternal variables.

*Ssignificant at p<0.05,

DISCUSSION

SOCIO-ECONOMIC CHARACTERISTICS

Housing Characteristics of the Women

The study collected information on housing characteristics and household amenities. The housing characteristics included the type of dwelling occupied by the household, and type of roof, wall and floor. Information on main water sources, toilet facilities and type of fuel used by the households for both lighting and cooking was also collected. Household possessions were also covered in the study. Information on these characteristics is useful in that it reflects on the household's socioeconomic status from a public health point of view (Ministry of Medical Services & Ministry of Public Health and Sanitation, 2009).

Households from where the women investigated came were made up of averagely 5 people. Houses had an average of 2.5 rooms. Roofs were mainly constructed of corrugated iron sheets (88%) and grass (12%). Floors were mostly mud (64%) and some were cemented (36%). Walls were constructed of brick (30%), mud/cement (6%), but mostly of mud only (63%). Most homes had pit latrines (90%) and only one had a flash toilet while others (9%) had no latrine at all and used nearby bushes. Majority (88%) had at least a radio and a few (17%) had a television set. None of the homes had refrigerators or piped water. Majority (55%) hauled water from locally dug out wells while some (45%) collected water from nearby streams. Most women (50%) used

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firewood as fuel for cooking, some (23%) used charcoal, few (7%) used both charcoal and firewood and only a few (18%) used a combination of charcoal, paraffin and cooking gas.

Women's Age and Marital Status

The average age of the women was 23.4 at the time of the study (Fig 1). Majority (64%) of the women had their first pregnancy at below 19 years while 36% had their first pregnancies at over 19 years. The women's parity was averagely 2.7. Most (86%) of the respondents were married, some (12%) were single while 2% were widowed. This may be an indication that women in this region marry and have children in their teenage years. This may also explain why these women's educational levels are lower than for the men.

Women and their Husbands' Educational Level

Seven percent of the women had tertiary education, 9% had completed secondary school, 10% had attended but not completed secondary school, 2% had no education at all and 72% had attended primary school and either completed or dropped out before completion (Fig 2). If compared with the national, standards, these figures would be considered low. For instance 29% of women in Kenya have some secondary education while 12% have completed secondary school (CBS, 2003) compared to only 10% and 9%, respectively, from this study. Education is a human right and one of the major factors that contribute to better living standards, its importance cannot be overemphasised. Education insufficient to achieve basic literacy is however unlikely to bring much benefit (Ministry of Medical Services & Ministry of Public Health and Sanitation, 2009). As seen in figure 2, more than half of the women only had a primary level of education. This may imply that illiteracy levels are high among this study sample.

The husbands generally had higher levels of education than the women. Only 1% had no education at all, 10% had tertiary education, 16% had completed secondary education, 10% attended secondary but dropped before completion, and more (57.5%) of the men had only full or incomplete primary education (figure 2). The figures obtained from this study correspond with the national figures (10% and 16%) (CBS, 2004) for complete tertiary and complete secondary education respectively and is a confirmation of the status of men's education in Kenya.

Women's and their Husband's Employment Status

Most of the women (66%) were not employed while some were (23%) were self-employed with most of them involved in small businesses like hawking and selling in the market. Small

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proportions (3%) were casual labourers. Only a small percentage (8%) had some employment (wage earner) where they obtained wages at the end of the month (figure 3). Employment status of members of a household is vital because it is an important indicator of the economic status of the household (Ministry of Medical Services &Ministry of Public Health and Sanitation, 2009) and hence a key determinant of the dietary energy intake of the household. Employment is a means by which money comes into the household which in turn is used to obtain food which may be adequate or not adequate depending on the type of employment.

More men than the women tended to be involved in some income generating activity. Fewer men (21.8%) than women (66%) were un-employed; some (23%) were casual labourers, and more of the men (26.4%) were employed (wage earner) while most (28.7%) were self-employed (Fig 3). Husbands who are employed have a means of providing for the needs including food for their households. Households where husbands have some form of income may not lack food even if the wife is not employed. Traditionally men are supposed to be the household provider.

Household Size, Main Provider of Food and Main Source of Food

Average household size for the study households was 5 persons. Most (61%) of the households were provided for by the husbands, less than half (26%) of the households were provided for by both the husband and wife, a few of the households were either provided for by parents (6%) or other relatives (7%) (Table 2). The single women were young adolescents who lived with either a relative or parent. Widowed women were also supported by a relative. Almost all the households (85%) obtained their food mainly by subsistence farming; a few (15%) however obtained their food through purchase. This finding suggests that most women obtained their food through subsistence farming and that most women did not have much financial capability to provide for themselves. This is because most women were not employed but more husbands than wives had some form of employment (Figure 3).

Wealth Index of the Women

The wealth index was a composite measure of the living standard of the pregnant women's household's ownership of selected assets, materials used for housing construction, and water and sanitation facilities. The wealth index placed the pregnant women's households on a continuous scale of relative wealth using principal components analysis. The pregnant women were ranked according to the score of the household in which they resided. The index categorised the women into four quintiles: Poorest, Second poorest, Middle and Slightly rich. Only 5% of the women fell within the slightly rich wealth index and 17% fell within the middle wealth index. Majority fell within either second poorest (36%) or poorest (42%) wealth indices (figure 4). This finding

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suggests that this study sample was made up mostly of women from poor households. This finding may be in agreement with a 2006 FAO report that found a proportion of Kenyans to be suffering from food poverty and further reported that Nyanza, Rift valley and Eastern provinces contributed 66% of the total rural food poverty. The report further states that there is an intricate relationship between food poverty and absolute poverty (Barasa, 2006).

Energy Intake

All the nutrients measured by the two methods varied only slightly (table 3). Intakes of energy, carbohydrates and proteins, vitamin C, folic acid and zinc tended to be slightly underestimated by the 24-hr recall method but the differences were not significant (P < 0.05). Data from this study supports this observation. The lack of significant differences in intake of all nutrients assessed by the weighed food method and the recall technique in this study group show that 24 hour recalls can produce reliable data. The two data sources serve to validate the intakes obtained because of the closeness of the results. It is possible that the difference in the intakes of some nutrients obtained by the recall and weighed intakes in this study may have been reflections of actual variations because they represented mean values for intakes on different days of the week and differences in the sample sizes for the two methods. Most of the food nutrients presented in table 3 did not meet the recommended daily values. Only vitamin C and fibre were taken in excess of the recommended values. The quantity of protein consumed was not very low although it did not reach 100% adequacy. The nutrient intakes for most nutrients among this study sample were inadequate except for vitamin C and fibre. These findings compare with a 2006 Nakuru study of dietary quality of pregnant women (Mbuthia & Elmadfa, 2007) in which there was inadequate intake for energy, folic acid, calcium, iron and zinc but adequacy was obtained for fibre and vitamin C. Dietary iron and folic acid intakes were well below adequacy levels i.e. 49% and 21.4% respectively. Another study by Steyn & Nel (2006) on dietary intake of adult women in South Africa, Nigeria and Kenya found Kenyan women's dietary intake of carbohydrate and fat to be almost similar to findings from this study. Kenya diets lack in energy intake for most age groups and intake of most nutrients of women in Kenya is alarming (Sehmi, 1993).

Kilocalorie intake among the women was disaggregated according to various characteristics of the pregnant women (table 4). According to education status intake appeared highest (1634.2 Kcal/day) among women with tertiary education, followed by those who completed secondary (1517.5 Kcal/day), followed by primary and lastly those who had some secondary education (1362.8 Kcal/day). Apart from those with some secondary education, energy intake may be said to be proportionally related to education level so that the higher the education level the higher the energy intake. This may be because women with tertiary education are more food secure than

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other groups since these women have their own incomes. Women's cash income is comparatively more significant in terms of a family's standard of living as they spend it on the family (Wardlow, 2003).

According to women's employment status, energy intake was highest among women who were casual workers (2087.40 Kcal/day) and lowest among the wage earners (employed women)(1248.54 Kcal/day). Women who are employed may be at risk of compromised diets because of reduced time for shopping and cooking and being away from home, it is also less likely that they ate three meals a day. This suggestion may explain why energy intake was lowest among women who were employed. According to husbands' level of education, energy intake appeared highest (1616.6 Kcal/day) among women whose husbands had completed secondary education followed by those whose husbands had some secondary education (1479.9 Kcal/day) then those with husbands with primary education (1386 Kcal/day) and lowest among those with husbands with tertiary education.(1375.5 Kcal/day).

According to husbands' employment status, energy intake was highest among women with selfemployed husbands (1603 Kcal/day) followed by those with husbands who were employed (1419.8 Kcal/day), then those with husbands who did casual work (1380.8 Kcal/day) and lowest among those with unemployed husbands (1316.3 Kcal/day). It may seem that self-employed husbands commit more of their income to family well being than husbands who are employed. According to the household provider, energy intake was highest (1481.1 Kcal/day) among women whom together with the husband were the main family provider followed by those whose husbands were the main provider (1427.8 Kcal/day), then those provided for by parents (1390.6 Kcal/day) and lowest among those whose main provider was relatives (1384.5 Kcal/day).

Households provided for by both husband and wife may seem to be at a better position to feed the family since income is higher and family is better placed to manage the reality of high cost of living in Kenya. Women in this study need to be empowered to have incomes so that they can supplement the husband's income as a measure to improve their energy intake. Energy intake observed against method of obtaining food was found to be highest among women whose households obtained food mainly through purchase (1503.6 Kcal/day). This may have been so because those who produced food may have had their food stocks depleted as a result of drought and famine and lacked money to buy enough food. They may be food insecure because they lack modern technologies and technological knowhow to produce enough food that would last them up to the next harvest season. This study was done during the hungry season (from the planting season), therefore, households that depended on own production may have depleted their stocks of food.

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A Kenvan Energy economic survey defines food poor households as those not meeting a minimum calorie requirement of 2250 Kcal/day/adult (GOK/UNICEF, 1998). The figures obtained in this study therefore describe the women investigated as falling well below the energy requirement level. For these women this deficit is even higher since pregnant women's recommendation is normal requirement plus 300 Kcal/day (FAO, 2001). The finding from this study (1436.4 Kcal/day) is only about 57.5% of the Recommended Daily Allowances for energy. This translates into a deficit of about 1113.6 Kcal/day. Shetty (2002) describes women's energy intake in developing countries to be between 1200 – 1800 Kcal/day and observed that dietary intake remained low throughout pregnancy. This observation supports the findings from this study because energy intake falls within this range. This is an indication that the situation in developing Nations and especially in Kenva has not improved but may have become worse as problems of poor rural women have common roots in many regions and have broad applicability rather than isolated to the setting under study (Leslie, 1991). A FAO report states that high poverty levels interfered with farming in Nyanza and that many farmers could not access loans due to lack of collateral (Barasa, 2006). This may explain why energy intake from this study (carried out in the same region) remains fairly low. A study of the Lake Victoria region in Kenya (Waudo et al. 2005) where this study area falls found kilocalorie intake of women to be 1505 Kcal/day. This is very close to the findings from this study and further confirms the state of energy deficiency in the region. This finding is, however, synonymous with the finding obtained from weighed food intake and may be a reflection of the greater accuracy of food weighing over 24 hour recall for individual intakes.

The situation was made worse following a period of drought and famine that affected the whole country implying extreme food shortage and inflated food prices that were far beyond the means of most families who survive on less than a dollar a day (Barasa, 2006). This may explain why energy intake was slightly lower than that from Waudo *et al's* (2005) study carried out in the same region. A study that compared energy stress in rural women from India, Berlin and Ethiopia found a consistent although not a remarkable (6-8%) decline in intake during the lean season. A similar study carried out during the period of food abundance may or may not elicit a significant difference as shown by this comparative study (Ferro-Luzzi, 1990). Chalterjee *et al* (1989), however, argues that seasonal shortfall in food availability tends to affect women disproportionately since their already inadequate intake will be curtailed drastically and further states that even if food is available; it tends to be preferentially allocated to men. Therefore if another similar study was carried out in the same region during the period of food abundance there may not be a remarkable increase in energy intake.

Results presented on table 5 show that calorie intake, had a significant and positive correlation with women's occupation (r=0.274, p < 0.045) but not the other social economic factors that

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were tested on calorie intake. Calorie intake was determined by the women's occupation. Husbands' occupation had a positive and close but not significant relationship with calorie intake.

CONCLUSION

The sample of pregnant women was relatively young. This study highlights the plight of women in Southern Nyanza; the low living standards of majority of the women, the high illiteracy levels, harsh living conditions, women's unemployment and a struggle by pregnant women to survive despite constraints paused by their environment. This study found women in this region to consume less calories than the value recommended as adequate. This finding agrees with the findings from Waudo *et al's* study (2005) of dietary intake of women in the same region and confirms several observations in developing countries that the extra energy cost of pregnancy is imposed upon a limited supply of food and that pregnant women may not have the possibility of increasing their energy intake very much (Vinoy, Rossetta & Taylor, 2000). Most of the food energy came from carbohydrates which took made the bulk of the women's diet. There were no significant differences between 24 hour recall and observed intakes. This study found energy intake to have a significant and positive correlation with women's occupation.

The study found a significant correlation between energy intake and the women's occupation. Our study raises the possibility that low energy intake may be due to positive relationship with women's occupation and therefore women need to be empowered economically to be able to meet their daily requirements for adequate food. Nutrition and health organizations and the government of Kenya may use this finding as a benchmark when coming up with policies and strategies for improving maternal and child health and nutrition in Southern Nyanza. Adequate political will and resources need to be generated to support the actions required to tackle food security by overcoming environmental, social, and economic constraints that limit the women's improvement on access to food such as poverty and lifestyle practices that promote health.

REFERENCES

Barasa L.(2006) Hungry for a solution 10 years later, an assessment of the Kenya Government's progress towards achievement of World Food Summit goals. FAO Report; Daily Nation Friday 15th /10 /2006.

Chalterjee M and Lambert J. (1989). Women and Nutrition Reflections from India and Pakistan. Food and Nutrition Bulletin 4, 13-28.

ISSN: 2455-6939

Volume:02, Issue:04

Central Bureau of Statistics (CBS) Kenya, Ministry of Health (MOH) Kenya and ORC Macro, (2004). Kenya Demographic Health Survey2003: key findings. Caverton USA, MOH and MACRO.

ECOSOC, 2007. Strengthening Efforts to Eradicate Hunger. Report.

FAO (2001). FAO/WHO/UNU Expert Consultation on Human Energy Requirements. Final Report, Rome.

Food and Agricultural Organization (FAO), 2012. Kenya Situation Analysis for TransformedNutrition:NutritionCountryProfiles-RepublicofKenya.http://www.fao.org/ag/agn/nutrition/profiles-en.stm.

Ferro-Luzi A. (1990). Seasonal Energy Stress in marginally nourished Rural Women: Interpretation and Intergrated cconclusions of a Multicentre Study in three Developing Countries. European Journal of Clinical Nutrition 44 (1): 41-46

Leslie J. (1991). Nutrition: the key to improving family health in developing countries? Health Policy and Planning 6 (1): 1-9

Mbuthia E, and Elmadga I. (2007). Diet Quality of Pregnant Women attending Ante-natal clinic at Nakuru Kenya. American Nutrition Metabolism; Journal of Nutrition Metabolic Diseases and Dietetics 51:324-330.

Ministry of Medical Services and Ministry of Public Health and Sanitation. (2009). Kenya Household Health Expenditure Utilisation Survey Report 2007.

Republic of Kenya Ministry of Health, 2013. National Nutrition Monitoring and Evaluation Framework.

Sehmi Jk, (1993). National Food composition Tables and the Planning of satisfactory Diets in Kenya. GOK 6

Shetty P. (2002). Human Energy Requirements: Where are we now? Issues emerging from 2001 Expert Consultation on Energy in Human Nutrition. Food, Nutrition and Agriculture, FAO 5-11.

Steyn NP and Nel JH, (2006). Intake of Adult Women in South Africa, Nigeria and Kenya with a Focus on Spreads: Chronic Diseases lifestyle Unit, Medical Research Council Report

UNICEF/GOK (1998). A Situation Analysis of Children and Women in Kenya. GOK/UNICEF Publication.

<u>www.ijaer.in</u>

ISSN: 2455-6939

Volume:02, Issue:04

Vinoy S, Rosetta L, and Taylor M. (2000). Repeated Measurements of Energy Expenditure and Energy Balance in Lactating Bangladeshi Mothers. European Journal of Clinical nutrition; 54 579-585.

Wardlaw GM. (2003). Contemporary Nutrition: Issues and Insights. 5th ed. McGraw Hill, 450-452.

Waudo J, Tuiteok P, Msuya J, Kikafunda J. (2005). Food Consumption Patterns and Nutrient Intakes by Women and Under Five year old Children in the Wetlands of Lake Victoria. A Paper presented at KCan Regional Conference Nairobi.