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Original Research Report

Kitchen Workstation and Stress in Meal Preparation by Women in Households of Ogun State, Nigeria.

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Abstract: Working in kitchens places significant stress on women especially if conducted in awkward postures and poor work environment. This study assessed Kitchen workstation and Stress in meal preparation by women in Households in Ogun State, Nigeria. Multistage Sampling technique was utilized to select 42 women; Google form was used to collect data for the study. Data were analysed using frequency, percentage, PPMC and ANOVA. The results revealed that 42.9%, 47.6%, 57.1% of the women used modern kitchen workstation partially equipped with furniture and appliance with meal prepared two times daily and spent 3-5hours in preparing meal for members of the household. PPMC ($r = 0.443$, $P<0.05$), ($r= 0.486$, $P<0.05$) revealed significant relationship between the posture used to carrying out activities in the kitchen and the perceived stress/fatigue experienced by women at the kitchen workstation and between frequency of meal preparation by women in the household and perceived stress/fatigue experienced by women at the kitchen workstation. ANOVA revealed ($F =.803$, $P<0.05$) tiredness, pain and stress are significant factors influencing perceived stress/fatigue of women at the kitchen workstation. It was concluded that women in the household experienced tiredness and pain due to posture in carrying out kitchen activities, frequency of meal preparation and the type of kitchen workstation used by the women. it was recommended that community outreach programme for improving kitchen ergonomics, and support to women in balancing their responsibilities to reduce the stress with frequent meal preparation, thereby improving the overall well-being.

Keywords: Fatigue, Kitchen workstation, Posture, Well-equipped, Women

1. Introduction

From time immemorial there are different types of kitchen workstation from traditional kitchen workstation where firewood's are fetch from the bush, traditional cooking devices are used such as "adogan" in Yoruba speaking geopolitical zone or Southwestern, Nigeria. Where firewood's are gathered, fanned and fueled to ember fire to modern kitchen workstation that is well-equipped. Women in Africa spend significant time in the kitchen in order to take care of the members of the households in the course of preparing one meal or the other, in fact, there have been situation where they can spend the whole day preparing meal. Another dimension to the issue is that women are usually regimented to the timetable of preparing meal in the morning, afternoon, evening in the process they can wake up as early as 5 a.m. and remain in the kitchen till the sleeping time depending on their status in household as housewives or working women (career women).

A meal can be seen as a part of a structured event, an occasion organized by rules concerning time, place and sequence of action (Douglas & Nicod, 1974)). Fathers' employment may not be related to family food environment characteristics because traditional gender roles suggest that women are responsible for food in the home, irrespective of whether women are employed or not and despite men having time to give commitment to their families' healthful eating due to less than full-time employment (Bauer *et al.*, 2012). Homemade food preparation is a means of preparing foods for the members of the family, to take care of the nutritional needs and wants of the members. It may seem expensive and time-consuming but the major advantage is that it does not contain chemicals in the form of food additives which can make household food unwholesome (Mbah & Olabisi, 2015).

Women also play a significant role during celebration in Africa, in most cases they are the ones in charge of food preparation either directly as the celebrant or indirectly in the process of assisting their friends, relatives, thus the concept of "ara ri mi se ti wa" particularly, in Yoruba speaking area of Nigeria. The career women will not want their home to be broken, therefore, they are conscious of the fact that in spite of the demand of their career or work the meal must be available at the table at appropriate time in the day for their husband and the children. The adage in the Yoruba speaking area indicates that the women can find way to the men heart through their food. Some of these women have taken food preparation at parties, events, luncheon, seminars, conferences, take away food outlets, restaurant and hotels etc. as a vocation in the sense that meal preparation is done for the purpose of earning income in terms of wages or salaries ("alase", event planner). Ahlgren *et al.* (2004) A meal can be cooked at home by the consumer or others, but it can also be cooked outside the home, for example, in hotels, restaurants and cafes, institutional kitchens or takeaway and retail outlets.

Food preparation involves the production of food commodity for consumption from its raw stage to consumable form. It entails the selection, measurement and combining of ingredients in an ordered procedure to achieve a desired result. It includes but is not limited to cooking. This effort is to make food edible, preserve it, and transform its characteristics has sustained an ever-increasing population. Many techniques, including grinding, sifting, drying, salting, sealing, fermenting, and applying heat, are extremely important. Fundamentally new techniques have been introduced in the past two centuries, among them is microwaving. The main long-term change has been the shifting of tasks from the

domestic floor to centralized factories.

1.1. Statement of the Problem

All of the above scenario are accompanied with stress in terms of the time spent in the meal preparation, mode/method/means of the meal preparation, activities put into meal preparation which require different posture of the body with accompanying sickness, injury, accident as a result of meal preparation etc. Kitchen fatigue results from the endless retracing of steps. Back strain results from continually bending, stooping, and stretching, lifting and carrying heavy items or pushing and pulling, while forceful or repetitive activities and poor posture can be linked to upper limb injuries (Bhatt & Sidhu, 2012). Working in kitchen places a significant stress on women especially if conducted in awkward postures and poor work environment. Major cause of poor work practices was unconsciousness and poor infrastructure of storage and work counter (Laddha, 2007)). On the other hand, food preparation can be stressful, especially when hunger, distractions, and time constraints come into play (Daniels *et al.*, 2012). Osdoba *et al.* (2015) hypothesized that given the stressful consequences inherent to making choices of ingredients for meal, it is expected that the chosen ingredients have detrimental effects on mood and stress, specifically, it was hypothesized that if people did not choose their meal ingredients, they would show a greater improvement in measures related to mood and larger reduction in stress after eating than if they did choose their meal ingredients. Thus, the research on workstation and meal preparation by women in households. This study will assess the stress felt, challenges faced by women in existing kitchen workstation.

1.2. Purpose of the Study

a) Describe the socio - demographic characters of women in the household
b) Identify the type of kitchen workstations used by women in the household
c) Determine the frequency of meal preparation by women in the household
d) Determine the time spent in preparing meal for members of the household
e) Describe the posture used to carrying out some activities like boiling, sieving, kneading, peeling, dish washing, cutting, grating, dish washing vegetables, grinding. rolling etc. in the kitchen
f) Determine the perceived stress/fatigue experienced by women at the kitchen workstation activities

1.3. Research Questions

a) What type of kitchen workstation used by women in the household?
b) What are the frequency of meal preparation in the household?
c) What is the time spent in preparing meal for the household in a day?
d) What is the posture used to carrying out some activities like boiling, sieving, kneading, peeling, dish washing, cutting, grating, washing vegetables, grinding etc. in the kitchen?
e) What are the perceived stress/fatigue experienced by women at the kitchen workstation activities?

1.4. Hypotheses

The hypotheses were set in a null form;

$Ho_{1;}$ There is no significant relationship between the posture used to carrying out activities in the kitchen and the perceived stress/fatigue experienced by women at the kitchen workstation

$Ho_{2:}$ There is no significant relationship between frequency of meal preparation by women in the household and perceived stress/fatigue experienced by women at the kitchen workstation

$Ho_{3;}$ Factors influencing perceived stress/fatigue experienced by women at the kitchen workstation

2. Materials and Methods

2.1. Design for the Study

Multistage Sampling technique was adopted for the study. This involved the selection of 15% of the twenty local government areas in Ogun –State. These local government areas were Odogbolu Local government area (15 wards), Ijebu-Ode local government area (9 wards) and Ijebu- North-East local government area (10 wards).

2.1.1. Ethics Statement

The researchers obtained respondents informed oral consent to fill the Google form. The researchers also adhered to ethical standards for research involving human subjects such as maintaining respondent anonymity and confidentiality.

2.2. Area of the Study

The study areas are three local government areas in Ogun State. Namely Odogbolu Local Government Area, Ijebu Local Government Area and Ijebu North East Local Government Area. The three Local Government areas are characterized by the following features. Odogbolu is a Local Government Area situated in the north-west area of Ogun State, Nigeria, with an area of 541 km2 and a population of 127,123 (NPC, 2006) (Wikipedia, 2016) and is located approximately on longitude 6o 30'N and latitude 3'0o E. Ijebu Ode is a Local Government Area and city located in south-western Nigeria, close to the A121 highway. The city is located 110 km by road north-east of Lagos; it is within 100 km of the Atlantic Ocean in the eastern part of Ogun State and possesses a warm tropical climate. Ijebu North East Local Government Area has its headquarter in Atan at 6'' 54'N 4'' 01'E with area of 118km2.

2.3. Population and Sample

In this case, questionnaires designed in the Google form were sent to the WhatsApp number of the sixty respondents (60 homemakers) that the researcher was able to get from the wards of the three Local Governments designated for the study. 42 respondents responded to the questionnaire.

2.4. Instrument for Data Collection and Study Procedure

Google form was used to collect data for the study. In this case, questionnaires designed in the Google form were sent to the WhatsApp number of the sixty respondents (60 homemakers) that the researcher was able to get from the wards of the three Local Governments designated for the study. 42 respondents responded to the questionnaire.

2.5. Data Collection Technique

Simple random sampling technique was used to select 30% of wards in each of the local government areas i.e. 5wards, 3 wards and 3 wards in the three Local Government areas respectively. The last stage involved the use of convenience sampling technique to select 20 women homemakers from wards thus giving a sample size of Sixty respondents (60).

2.6. Data Analysis Technique

The data collected for study were analyzed using descriptive statistics such as frequency, percentage and mean and inferential statistics such as Pearson Product Moment Correlation (PPMC) (hypotheses 1&2), Analysis of variance (ANOVA) for hypotheses 3& 4.

Table1: Sampling Frame and Size of the Study

S/No	No of LGA in Ogun State	Selected LGAs for the Study	Number of Wards in the LGAs	Selected Wards for the Study	Sample Chosen	Responses/Sample size
1	20	Odogbolu LGA	15	5	20	15
2		Ijebu-Ode LGA	9	3	20	17
3		Ijebu North East	10	3	20	10
Total	20	3	34	11	60	42

3. Results and Discussion

3.1: Socio-Demographic Characteristics of women in the Households

Table 2: Demographic Characteristics of Women

	Variable	Frequency	Percentage
Age	30-35yrs	23	54.8
	36-40yrs	9	21.4
	40-45yrs	7	16.7
	50-60yrs	2	4.8
	60yrs above	1	2.4
	Total	42	100
Income level	High income	20	47.6
	Middle income	19	45.2
	Low income	3	7.1
	Total	42	100
Occupation	Trader	11	26.2
	Artisan	7	16.7

	Civil servant	11	26.2
	Teachers	6	14.3
	Others	7	16.7
	Total	42	100
Marital Status	Married	32	76.2
	Single	2	4.8
	Cohabiting	7	16.7
	Divorced	1	2.4
	Total	42	100
Family type	Nuclear	36	85.7
	Extended	6	14.3
	Total	42	100
Household size	1-4	21	50
	5-7	18	42.9
	8 and above	3	7.1
	Total	42	100

Source: Author's Field Computation (2024)

The analysis in Table 2 revealed that 54.8% of the were between the age of 30-35years, 21.4% were between 36-40years 16.7% were between 40-45years, 4.8% were 50-60years of age while 2.4% was above 60years of age. This shows that majority of the women were between the age range of 30-35yrs. Income level analysis discovered that 45.2% of the women received High income, 47.6% received middle income while 7.1% received low income. This shows that majority of the women were in the Middle income level. The occupation analysis of the women revealed that 26.2% women were traders, 16.7% were artisans, 26.2% were civil servants, 14.3% were teacher and 16.7% were into others occupation. The marital status revealed that 76.2% were married, 16.7% were divorced and 2.4% were still cohabiting. This shows that majority of the women were married. Family type indicated that 85.7% of the women had Nuclear family type and 14.3% had extended family type. Lastly, the household size of the family revealed that 50% of the women had 1-4 family size, 42.9% had 5-7 family size and 7.1% had above 8 family size.

Table 3: Type of kitchen workstations used by women in the household

	Frequency	Percent
Traditional Kitchen workstation	16	38.1
Modern kitchen workstation sparing equipped with kitchen furniture and appliance	18	42.9
Modern kitchen workstation well equipped with kitchen furniture and appliances	8	19.0
Total	42	100.0

The above analysis in Table3 revealed the type of kitchen workstation used by women in the households, it revealed that 38.1% of the women used traditional kitchen workstation, 42.9% used modern kitchen workstation sparing equipped with kitchen furniture and appliance while 19% used modern kitchen workstation well equipped with kitchen furniture and appliance. This indicates that the kitchen workstation of the women is admixture of average to traditional kitchen workstation that is indicative of the social status of the households.

Table 4: Frequency of meal preparation by women in the household

		Frequency	Percent
Valid	Food is prepared three time daily	14	33.3
	Two times daily	20	47.6
	Once daily	1	2.4
	The household members eating out all the times	5	11.9
	Other patterns of food consumption	2	4.8
	Total	42	100.0

The above analysis in Table 4 showed that 33.3% of the women prepared meal three time daily, 47.6% prepared meal two times daily, 11.9% eat out all the time while 4.8% used other patterns of food for consumption. This is the reflection of the current economic reality in Nigeria whereby different feeding patterns are adopted in the households. Two, this is as a result of hunger which is gradually being translated to famine and food insecurity. Moreover, the standard of living of people is plummeting on daily basis due to insufficient disposable income to purchase food and basic needs of life.

Table 5: Time spent in preparing meal for members of the household

Time spent		Frequency	Percent
Valid	3-5hours	24	57.1
	6-8hours	15	35.7
	8hrs above	3	7.2

Analysis of Table 5 above revealed that 57.1% spent 3-5hours in preparing meal for members of the household, 35.7% spent 6-8hours in preparing meal while 7.2% spent 8hrs above. This shows that majority of the women spent 3-5hours in preparing meal for members of the household.

Table 6: Posture used to carry out some activities in the kitchen

Kitchen Activities	Variable	Frequency	Percentage
Boiling	Standing (3-5minutes)	24	57.1
	Siting More than 15 minutes	13	31.0
	Bending (6-15minutes)	5	11.9
	Total	42	100
Kneading	Standing (3-5minutes)	29	69.0
	Siting More than 15 minutes	11	26.2
	Bending (6-15minutes)	2	4.8
	Total	42	100
Sieving	Standing (3-5minutes)	28	66.7
	Siting More than 15 minutes	10	23.8
	Bending (6-15minutes)	4	9.5
	Total	42	100
Peeling	Standing (3-5minutes)	28	66.7
	Siting More than 15 minutes	10	23.8
	Bending (6-15minutes)	4	9.5
	Total	42	100
Cutting	Standing (3-5minutes)	25	59.5
	Siting More than 15 minutes	15	35.7
	Bending (6-15minutes)	2	4.8
	Total	42	100

Washing e.g. vegetables	Standing (3-5minutes)	36	85.7
	Siting More than 15 minutes	6	14.3
	Bending (6-15minutes)	3	7.1
	Total	42	100
Rolling	Standing (3-5minutes)	25	59.5
	Siting More than 15 minutes	14	33.3
	Bending (6-15minutes)	3	7.1
	Total	42	100
Stirring	Standing (3-5minutes)	26	61.9
	Siting More than 15 minutes	14	33.3
	Bending (6-15minutes)	2	4.8
	Total	42	100
Grinding	Standing (3-5minutes)	28	66.7
	Siting More than 15 minutes	8	19.0
	Bending (6-15minutes)	6	14.3
	Total	42	100
Grating	Standing (3-5minutes)	32	76.2
	Siting More than 15 minutes	6	14.3
	Bending (6-15minutes)	4	9.5
	Total	42	100
Washing Dish	Standing (3-5minutes)	29	69
	Siting More than 15 minutes	10	23.8
	Bending (6-15minutes)	3	7.1
	Total	42	100

The above analysis Table 6 revealed the posture women used in carrying out some activities like boiling, sieving, kneading, peeling, dish washing, cutting, grating, dish washing vegetables, grinding. rolling etc. in the kitchen. It was revealed that majority of the women preferred standing within 3-5minutes, more than 15minutes sitting while 6-15minutes bending while boiling, sieving, kneading, peeling, dish washing, cutting, grating, dish washing vegetables, grinding. rolling etc. in the kitchen, the posture depends or varies on how long the kitchen activities will be carried out in the household.

Table 7: Perceived stress/fatigue experienced by women at the kitchen workstation activities

Kitchen Activities	Variable	Frequency	Percentage
Boiling	Pain	10	23.8
	Tiredness	30	71.4
	Stress	2	4.8
	Total	42	100

Kneading	Pain	20	47.6
	Tiredness	19	45.2
	Stress	3	7.1
	Total	42	100
Sieving	Pain	25	59.5
	Tiredness	13	31.0
	Stress	4	9.5
	Total	42	100
Peeling	Pain	19	45.2
	Tiredness	19	45.2
	Stress	4	9.5
	Total	42	100
Cutting	Pain	18	42.9
	Tiredness	22	52.4
	Stress	2	4.8
	Total	42	100
Washing e.g. vegetables	Pain	21	50
	Tiredness	18	42.9
	Stress	3	7.1
	Total	42	100
Rolling	Pain	22	52.4
	Tiredness	17	40.5
	Stress	3	7.1
	Total	42	100
Stirring	Pain	18	42.9
	Tiredness	22	52.4
	Stress	2	4.8
	Total	42	100
Grinding	Pain	10	23.8
	Tiredness	26	61.9
	Stress	6	14.3
	Total	42	100
Grating	Pain	21	50
	Tiredness	17	40.5
	Stress	4	9.5
	Total	42	100
Washing Dish	Pain	23	54.8
	Tiredness	16	38.1

	Stress	3	7.1
	Total	42	100
Puffing	Pain	19	45.3
	Tiredness	13	31.0
	Stress	10	23.8
	Total	42	100

The above analysis Table 7 revealed the perceived stress and fatigue experienced by women at the kitchen workstation activities. It was revealed that majority of the women feel pain, tired and stress while in the kitchen and it's affected some part of body e.g. wrists, fore arm, upper arm, shoulder, neck, leg, lower back and others.

Hypotheses

Ho_1; There is no significant relationship between the posture used to carrying out activities in the kitchen and the perceived stress/fatigue experienced by women at the kitchen workstation

Table 8: Correlation between posture used to carry out activities in the Kitchen workstation and fatigue experienced

Correlations (Pearson Moment Correlation Bivariate)

		Posture carrying out activities	Perceived Stress/fatigue
Posture carrying out activities	Pearson Correlation	1	.443
	Sig. (2-tailed)		.004
	N	42	42
Perceived Stress fatigue	Pearson Correlation	.443	1
	Sig. (2-tailed)	.004	
	N	42	42

From Table 8, the value of Pearson correlation coefficient was .443, at the p-value .004, as a result the null hypothesis was rejected, alternative hypothesis accepted that there is significant relationship between the posture used to carrying out activities in the kitchen and the perceived stress/fatigue experienced by women at the kitchen workstation. Since the p-value in the output (.004) is less than .05. Two, the Pearson correlation coefficient (.443) was a positive value, this indicates that there is a positive correlation between the two variables. The findings supported Regatta (2019) that the relationship between posture during kitchen activities and perceived stress or fatigue experienced by women is an important area of study in ergonomics and occupational health. It has been demonstrated by various studies that poor posture while performing kitchen tasks can lead to increased physical

discomfort and mental stress. For instance, activities in the kitchen often involve both static postures (e.g., standing while chopping vegetables) and dynamic postures (e.g., bending and reaching for items). Static postures, especially when held for prolonged periods, can lead to muscle fatigue and discomfort. Dynamic postures, if repetitive and ergonomically unsound, can also contribute to musculoskeletal strain. According to Gangopadhyay (2015) improper postures in the kitchen, such as frequent bending and prolonged standing, can lead to musculoskeletal disorders (MSDs). This, in turn, can cause significant physical fatigue and discomfort, particularly in the lower back, shoulders, and neck. Poor postural ergonomics can increase the cognitive load on individuals. When the body is uncomfortable, the brain is constantly receiving signals of discomfort, which can distract from the task at hand and increase mental fatigue. Matilla-Santander *et al.* (2021) highlights the relationship between physical discomfort and increased levels of perceived stress and fatigue among women performing repetitive kitchen tasks. The body's response to physical discomfort includes the release of stress hormones like cortisol. Over time, this can lead to chronic stress. A study by Regatta (2019) showed that women who reported higher levels of physical discomfort in the kitchen also reported higher levels of stress and mental fatigue.

Ho_2: There is no significant relationship between frequency of meal preparation by women in the household and perceived stress/fatigue experienced by women at the kitchen workstation

Table 9: Correlations (Pearson Moment Correlation Bivariate

		Perceived Stress/fatigue	Pattern of daily consumption in the households
Perceived Stress fatigue	Pearson Correlation	1	.486
	Sig. (2-tailed)		.002
	N	42	42
Pattern of daily consumption in the households	Pearson Correlation	.486	1
	Sig. (2-tailed)	.002	
	N	42	42

From the output we can see the following values, Pearson correlation coefficient: .486, p-value of Pearson correlation coefficient: .002, the null hypothesis is rejected, alternative hypothesis is accepted that there is significant relationship between frequency of meal preparation by women in the household and perceived stress/fatigue experienced by women at the kitchen workstation. Since the p-value in the output (.002) is less than .05. The Pearson correlation coefficient (.486) was a positive value, this indicates that there is a positive correlation between the two variables. The finding was in line with Smith (2018) that the frequency of meal preparation is directly correlated with the levels of stress and fatigue experienced by women. Frequent meal preparation is demanding and time-consuming,

contributing to higher levels of physical and mental fatigue. This is particularly evident in households where meal preparation responsibilities fall disproportionately on women. Women take primary responsibility for meal preparation, which can exacerbate feelings of stress and fatigue. Traditional gender roles may pressure women to cook frequently, even when they are balancing other responsibilities such as employment or childcare. The significant relationship between the frequency of meal preparation by women in the household and their perceived stress and fatigue is influenced by a combination of sociocultural expectations, psychological stressors, and ergonomic factors (Devine *et al.*, 2009).

Ho_3: Factors influencing perceived stress/fatigue experienced by women at the kitchen workstation

Table 9: Perceived Stress/Fatigue experienced by women at the kitchen workstation

ANOVA

Perceived Stress/ fatigue

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	26.833	10	2.683	.803	.004
Within Groups	103.643	31	3.343		
Total	130.476	41			

From the Table 9, there is significant result. The value of F is (.803), which reaches significance with a *p*-value of .004 (which is less than the .05 alpha level). This means tiredness, pain and stress are significant factors influencing perceived stress/fatigue of women at the kitchen workstation (Butcher, 2022). Tiredness is a common issue for many individuals, particularly for women who often managed many roles such as profession, household, and caregiving responsibilities and it can result from prolonged standing, repetitive motions, and the physical demands of cooking and cleaning. It has been shown that physical demands of kitchen tasks, such as lifting heavy pots and pans, repetitive chopping, and bending, contribute significantly to fatigue. This physical exertion can lead to cumulative tiredness over time, especially in the absence of ergonomic designs in kitchen tools and layout (Butcher, 2022). Devlin (2017) revealed that pain is closely related to both physical strain and ergonomics in the kitchen environment. Poor posture, improper kitchen counter heights, and the use of non-ergonomic tools can lead to musculoskeletal pain, which further exacerbates stress and fatigue.

4. Conclusion

It was concluded that women in the household experienced tiredness and pain due to posture in carrying out kitchen activities, frequency of meal preparation and the type of kitchen workstation used by the women. it was recommended that community outreach programme for improving kitchen

ergonomics, and support to women in balancing their responsibilities to reduce the stress with frequent meal preparation, thereby improving the overall well-being.

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Conflict of Interest

The authors declare that there is no conflict of interest in relation to this paper.

Author Contributions

OGA. conceived, collected data, analysed and drafted the research findings and submitted the manuscript. LMI reviewed and edited the research

Data Availability Statement

All data generated or analysed during this study are included in the published article, for further Information contact the authors.

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