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Health-Related Problems Associated with Women Garri Producers in Agricultural Zone

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ABSTRACT

Cassava processing into cassava porridge (known as garri) causes a lot of environmental and occupational health problems for female garri processors in Nigeria. Therefore, the study examined health-related problems associated with cassava processing into garri in the Ogbomosho Agricultural Zone, Oyo, Nigeria. Multi-stage sampling technique was used to select a total of 120 respondents in the study areas while an interview schedule was used to elicit information from the garri processors in the study area. Data were analyzed with descriptive statistics and inferential statistics (Pearson Product Moment Correlation and Chi-square). The majority of the respondents were married, Christians, and had no formal education. according to the respondents for the garri production, only packing (75.0%) was done weekly while other processing activities are done daily. Also, the majority of the respondents agreed that grating (81.7%) and Dewatering/fermentation (80.0%) are done using modern and traditional methods. Most of the respondents experienced different health issues with 54.2% experiencing a high level of health-related problems which could be a threat to sustainable garri processing and livelihoods. Governments, NGOs, and engineers should fabricate low-cost processing equipment that will reduce the time spent on each operation and the labor requirement for each.

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1. INTRODUCTION

Cassava (*Manihot esculenta*) is a perennial vegetatively propagated shrub and is one of the most important food crops grown in Africa (Bruijin-De & Fresco, 1989; El-Sharkawy, 2004; Abdoulaye *et al*., 2015; Chauhan *et al*., 2015). Cassava is for use as food in more than thirty-nine African countries (Oyegbami *et al*., 2010; Fadairo *et al*., 2014). Based on the above, cassava has become economically important in several tropical countries where the carbohydrate content of its enlarged root in diversified forms is consumed in most African countries, including Nigeria. Food products from cassava include garri (fermented and roasted granules), fufu (fermented and steamed cooked), puniru (fermented smoked dried balls and also gelatinized), and lafun (fermented, sun-dried flour and then gelatinized).

Cassava is fast changing from an inferior food to a necessity in Nigeria (Echebiri & Edaba, 2008). Garri for instance is becoming the most popular form in which cassava is consumed. Cassava is an excellent source of dietary energy, and it smacks of short-sightedness to consider cassava solely a subsistence food crop. Cassava provides a reliable and cheap source of carbohydrates for people in Sub-Saharan Africa.

in West Africa, cassava is eaten commonly as cassava porridge (known as garri), toasted coarse cassava flour granules that are cooked. Garri is eaten with various sauces both at home and in eateries. Growing demand for garri in the rapidly expanding cities of West African countries has been an important factor in encouraging farmers to produce more cassava. Hillocks in 2002 (see http://www.statcounter.com) stated that cassava's bulk is substantially reduced when processed into garri and thus most suitable for transport. Its shelf life is also increased. Although many millions of people safely eat cassava every day of the week, cyanogenic compounds are potential health risks associated with the crop.

Women are producers, processors, and marketers of agricultural produce and non-agricultural goods and services. A typical rural woman will work anywhere to meet household food security even at the expense of her health. The health status of rural women is important to the use of improved technology to enhance their standard of living and increase agricultural production. A woman whose health status is very poor will have a steady decline in agricultural production which eventually affects her family household and the nation at large. Women in good health condition can do better and even have multiple turnouts as compared to what we have now.

Cassava is the third most important food crop in the tropical world (Adebayo and Salahu, 2007; Hershey, 2017). Although it is low in protein, production is increasing because it grows well in poor soils and tolerates droughts. But it has major disadvantages during processing, as it liberates hydrogen cyanide which is a deadly poison; therefore, careful processing is highly needed. Two-thirds of the population in Nigeria consists of women of childbearing age and children under the age of fifteen years. Since they constitute: a particularly vulnerable group; they suffer most severely from the consequences of socio-economic development. The existing health services being provided through a network of government hospitals, dispensaries, and primary health centers do not reach or remain underutilized by women, especially, in rural areas. Otherwise, the health care provided to rural areas is glaringly disproportionate to the needs and abnormally low as compared to urban areas.

Women are responsible for the majority of the cassava processing, transportation, and harvesting tasks, while men are associated with farming largely non-mechanized. Cassava is largely grown and processed by women into garri and the women may be exposed to hydrogen cyanide fumes during the processing and experience related health problems. (Ferrar, 1992). The dangers of cassava frying in the traditional manner which is not only hot

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work but also causes severe eye irritation as prussic acid vapors to rise into one's face. Surveyed women stated that headache is often the result of head-loading and skin rashes from winnowing while heat exhaustion is a result of frying garri.

Several factors could be responsible for the exposure of garri processors in rural areas. Access to information is a potential means of reducing exposure to health risks associated with livelihood activities. However, with the low level of education of the rural women who are mainly involved in cassava processing activities, it remains to be seen how this affects the health status of the rural garri processors. Involvement in various stages of garri processing can also be a potential gateway to health-related constraints from cassava processing, especially since the very strenuous process of garri processing is predominantly carried out by traditional processing methods, which lasts for hours, However, it remains to be seen to what extent this could go. Other factors are the socio-economic characteristics of garri processors, access to credit facilities, and level of production.

It is for these reasons that this research addressed the following questions;

(i) What are the personal characteristics of women garri processors in the study area?
(ii) What are the specific health-related problems associated with garri processing among respondents in the study area?
(iii) Which processing techniques (processing activities) do the processors utilize in their processing activities

The following null hypotheses were tested.

(i) Hol There is no significant relationship between the selected personal characteristics of the respondents and the level of health-related problems from garri processing.
(ii) Ho2: There is no significant relationship between respondents' techniques used in processing garri and the level of health-related problems from garri processing.

2. METHODS

The study area is the Ogbomoso Agricultural Zone, Oyo State, Nigeria. The zone is one of the four zones of the Oyo State Agricultural Development Program (OYSADEP). This zone comprises five areas (known as LGA): Ogbomoso North, Ogbomoso South, Orire, Ogo Oluwa, and Surulere LGAs. The first two are urban while the other three are rural. The cassava processors are more concentrated in the rural areas of the Ogbomoso zone, Oyo State, Nigeria, which is bordered in the North by Olorunsogo LGA, in the west by Oyo LGA, in the south by Ejigbo LGA of Osun State and in the East by Asa LGA of Kwara State. Ogbomoso zone is located on latitude 8.1° N and 3.29 E.

The population of the study consisted of women who were engaged in garri processing in the Ogbomoso Agricultural zone of Oyo State. Multi-stage sampling technique was employed in the selection of 120 respondents' sample for this study. The study area was divided into five agricultural blocks by Oyo State Agricultural Development Programme for effective coverage of its activities. These blocks are Arowomole in Ogbomoso North Local Government. Ajaawa block in Ogo Oluwa, Ikoyi in Orire and Iresaadu block in Surulere Local Government Area. A purposive sampling procedure was used in the selection of three rural blocks. These are Ajaawa, Ikoyi and Iresaadu. Each block comprises eight (8) cells making it a total of 24 cells. Four cells were selected randomly from each block making it a total of 12 cells. Female garri processors were then purposively selected because of the highly stressful nature and prominence in the study area. 10 women were randomly selected in each cell making it a total of 120 respondents altogether. Primary data was collected through an interview schedule. Dependent and independent variables and independent variables were involved in this study.

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Both descriptive and inferential statistics were used to analyze the collected data. Descriptive statistics used are frequency, percentage distribution and mean, while chi-square, PPMC and are the inferential statistics that were used.

3. RESULTS AND DISCUSSION

This chapter presents the findings and discussion of the results.

3.1. Socio-Economic Characteristics of Respondents

Table 1 shows the socio-economic characteristics of female garri producers in the study area. Age is an important factor in determining the productivity and health status of a household. While people of young age groups are likely to enjoy better health status and helped improve productivity, the older generations may be on the reverse. The study reveals that 33.3% and 20.0% of the respondents were aged between 31-40 and 21-30 years respectively. The study also indicates the mean age of respondents as 39.6. This however shows that the majority of garri processors in the study area were in their active ages, and therefore are expected to engage fully in various garri processing activities:

Table 1. Distribution based on frequency and duration of garri processing activities (N = 120).

S/N	Activities	Daily Freq.	%	Weekly Freq.	%	Never Freq.	%	Average duration hour
1.	Sorting	119	99.2	1	0.8	0	0.0	1.01
2.	Peeling	118	98.3	2	1.7	0	0.0	2.89
3	Cutting	120	100.0	0	0.0	0	0.0	1.46
4.	Washing	120	100.0	0	0.0	0	0.0	1.08
5.	Grating	118	98.3	2	1.7	0	0.0	2.07
6.	Dewatering and fermentation	118	98.3	2	1.7	0.0	0.0	1.11
7.	Pounding	2	2.3					
8.	Fine mill	119	99.2	1	0.8	0	0.0	1.18
9.	Sieving	119	99.2	1	0.8	0	0.0	1.19
10.	Packing	30	25.0	90	75.0	0	0.0	1.04
11.	Storage	118	98.3	1	0.8	1	0.8	1.50

Table 1 shows the various garri processing activities in which respondents were involved and how often such activities are being carried out. The result shows that the majority of the processing activities were carried out daily. Among such activities were cassava cutting (100.0%), washing (100.0%), sieving (99.2%), sorting (99.2%), and fine milling (99.2%). The only activity that was not being carried out by the majority of the respondents was packing. This study implies that respondents are engaged in very tasking and stressful activities in garri processing. These activities require regular health tips for respondents to maintain sustainable health status and productivity.

On the duration of each of the processing activities, roasting of fermented and dewatered cassava was the most time-consuming activity of garri processing, with a daily duration of 9 hours. The nature of drying in which much heat is generated makes such activities suspicious of being one of the most health-challenging activities of garri processing. Peeling cassava is another activity with a relatively long duration of about 3 hours per day. Other garri processing activities are carried out within one to two hours. Cassava roasting technologies should be employed and adapted to the need of garri processors in the study area as this will reduce their levels of exposure to health risks associated with the stressful and time-

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consuming nature of the activities. This will help sustain the health status and productivity of garri processors in the study area.

Table 2 reveals the list of various health problems associated with cassava processing, and the severity of each. A very large proportion of the respondents in the study area experienced severe sight problems (98.3%), chest pains (97.5%), hotness of the body (93.3%), and total body weakness (93.3%). This could be due to the traditional method being employed by the respondents, which easily subject them to stress due to the energy-sapping and long-duration nature of the method. The study further reveals that garri processors in the study area encountered severe persistent tears (92.5%), headaches (92.5%), high body temperatures (90.8%), and general body pain. This also explains the fact that garri processing is stressful and thus, health challenging. On the other hand, while 75.8% did not experience blisters (75.8%) and anemia (81.7%), the majority though experienced blurred vision (54.2%), frequent cuts on the skin (70.8%), increased blood pressure (45.8%) and nose bleeding (46.7%), but not on a severe condition. This, therefore, implies that some health challenges are peculiar and closely associated with garri processing. Therefore, health intervention should be directed towards such health challenges that result frequently as a result of cassava processing.

Based on the score obtained by each respondent from all the items in **Table 2**, respondents were categorized into two- below the mean and mean score (see **Table 3**). Respondents whose scores belonged to the former were into having a low level of constraints while those whose scores belonged to the latter were categorized as having a high level of constraints. A mean of 39.4 was obtained and respondents were categorized accordingly.

Table 2. Distribution based on various health problems associated with garri processing.

S/N	Problems	Very Severe		Severe		Not Severe		Not Experience	
		F.	%	F.	%	F.	%	F.	%
1.	Chest pains	117	97.5	3	2.5	0	0.00	0.	0.00
2	Sight problems	118	98.3	1	0.8	1	0.8	0	0.00
3.	Body itching	1	0.8	71	59.2	39	32.5	9	7.5
4.	Blisters	7	5.8	6	5.0	16	13.3	91	75.8
5.	Headaches	111	92.5	7	5.8	0	0.00	2	1.7
6.	Hotness of the body	112	93.3	2	1.7	1	0.8	5	4.2
7.	Blurred vision	8	6.7	10	8.3	65	54.2	37	30.8
8.	Persistent tears	111	92.5	1	0.8	6	5.0	2	1.7
9.	Frequent cuts on the skin	1	0.8	15	12.5	85	70.8	19	15.8
10.	Skin rashes	4	57.5	41	34.2	6	5.0	4	3.3
11.	Fever	83	69.2	23	19.2	14	11.7	0	0.00
12.	Severe eye irritation	18	15.0	46	38.3	39	32.5	17	14.2
13.	Persistent catarrh	81	67.5	13	10.8	20	16.7	6	5.0
14.	Total body weakness	112	93.3	7	5.8	1	0.8	0	0.00
15.	High body temperature	109	90.8	9	7.5	2	1.7	0	0.00

Table 3. Level of health-related constraints to garri processing.

Category	F	%	Mean	Minimum	Maximum
High (18-39)	65	54.2	39.4	18.0	50.0
Low (40-50)	55	45.8			
Total	**120**	**100.0**			

The study revealed that the majority of the respondents (54.2%) have high levels of health-related constraints. This implies that the realities of health-related constraints affect the

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majority of garri processors in the study area. This may be due to the traditional method that the majority of them employ and which exposes them to long durations of stressful and health-challenging activities. There is no doubt that this will affect their productivity and entire livelihood.

3.2. Relationship Between Respondents' Socio-Economic Characteristics and Level of Health-Related Problems

Hol: There is no significant relationship between respondents' socioeconomic characteristics and health-related problems in garri processing activities.

One of the major expectations of this study is that each of the respondents" socio-economic characteristics will significantly determine their health-related constraints resulting from cassava processing activities. The result of the analysis however shows that only three of the selected six characteristics had a significant relationship with the level of health-related constraints respondents faced as a result of cassava processing activities.

Table 4 shows the educational status of the respondents (15.792: p=0.045). It showed a significant relationship with their level of health-related constraints resulting from cassava production activities. Education provides opportunities to access information on health-related issues and also exposes educated respondents to various health management tips. This may have accounted for the significant relationship. The study further shows that marital status (12.591, p=0.050) and access to credit facilities (7.730; p=0.021) showed a significant relationship with the level of constraints respondents faced, while access to credit facilities could enable garri processors process under reduced stress, which predisposes them to health challenges less frequently, married could also boast of multiple hands in form of family labor which help carry out processing activities This also enables them to cope better with stress than the single processors. This implies that credit facilities and marriage help reduce health-related constraints to garri processing in the study area.

Table 4. Chi-square table of the relationship between selected socio-economic characteristics and their level of health-related constraints.

Variables	X^2	df	P	Remark	Decision
Educational status	15.792	8	0.045	S	Reject Ho
Religion	6.541	4	0.162	NS	Accepted Ho
Marital Status	12.591	6	0.050	S	Reject Ho

The result of the analysis further shows that age showed a positive and significant (r = 0.231; p = 0.011) relationship with respondents' level of health-related constraints. This means that as the respondents increased in age, their level of health-related constraints increased. This is also validated by many years of family experience, having a positive and significant relationship with their levels of health-related constraints (r = 0.437; p = 0.000) as a result of cassava processing activities. The result means that the higher the years of family experience, the higher the level of health-related problems faced. This implies that garri processors may not be able to maintain sustainable health status, implying that the larger the household size, the less the level of health-related constraints experienced. This may be due to the traditional methods which are prevalent among processors in the study area. Also, the study showed that household size had a negative but significant relationship (r = -0.274; p = 0.010) with respondents' level of health-related constraints from garri processing. This result may not be unexpected since family members may be used as additional labor sources to carry out different activities which helps reduce stress and prone to sickness. This finding

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validates the earlier finding that marital status influenced the health-related constraints of respondents in the study area significantly.

3.3. Relationship Between the Number of Hours Spent in Cassava Processing

Ho2: there is no significant relationship between the number of hours spent in cassava processing activities and respondents' level of health-related problems from garri processing activities

Garri processing activities, being predominantly traditional, were expected to constitute health-related constraints to the processors, which is expected to however vary as a result of the variations in the duration of each of these activities. **Table 5** shows that a significant and positive relationship existed between respondents' number of hours spent in garri processing activities and their level of health-related constraints as a result of Garri processing activities, meaning that the longer the duration, the higher the level of health-related problems among respondents. This implies that garri processing activities stretch the majority of respondents beyond their strengths and abilities as a result of the traditional method involved in its processing. Therefore, the null hypothesis is rejected, while the alternative is accepted.

Table 5. Correlation of respondents' Hours of duration in processing activities with their health-related constraints from garri processing P Decision.

Variables	r	P	Remark	Decision
Age	0.231	0.011	S	Reject Ho
Household size	-0.274	0.010	NS	Accept Ho
Years of Experience	0.437	0.000	S	Reject Ho

4. CONCLUSION

The study concludes that gari processing is an important livelihood among women of different age groups many of whom had no advantage of formal education. Gari processing activity was being carried out with means of traditional processing methods, many of which are very stressful and thereby exposing many of the women to various health risks. The following recommendations are necessary in light of the above conclusions drawn from the study.

(i) Governments, non-governmental organizations, and private individuals particularly engineers should fabricate low-cost processing equipment and other items that will reduce the time spent on each operation and the labor requirement for each.
(ii) Greater attention should be given to supporting women's cassava processors through the provision of credit facilities and extension services.
(iii) Cassava peels should be sun-dried and used as livestock feed.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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