Women's participation in the local food system and implications for their dietary quality in rural Northern Ghana: A qualitative study

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Research Article

Keywords: Participation, Food system, Socio-cultural Barriers, Women's dietary quality, gender roles, household

Posted Date: December 10th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-1112895/v1

Abstract

Background

Women's activities within local food systems are linked with their dietary quality. Their ability to achieve a nutritious diet is often limited by socio-cultural norms, which have not been adequately studied. This study examined socio-cultural norms linked with rural food systems and their adverse effects on women's diets.

Methods

The study was conducted in two rural communities, Yilkpene and Kpachilo, in Northern Ghana between May and July 2016. Sixteen key informant interviews (KII) with community and institutional leaders, and eleven focus group discussions (FGDs) with community members were used to explore the nature of the food system, (production, processing, distribution, preparation and consumption), and how it is influenced by socio-cultural norms. Transcribed interviews were coded and analysed thematically, using inductive reasoning.

Results

The components of the food system in both communities were constructed, primarily, around men. Quantities, quality, and varieties of produce, distribution/marketing, and intra-household allocation were strongly dominated by male perceptions and practices about access and ownership of productive resources, and roles and responsibilities of household members. Men dominated in the production of cereals, and legumes, while women mainly produced/harvested vegetables and fruits, and limited quantities of legumes that have low economic value. Men sell their produce at higher market prices, at urban markets; women rarely sell their vegetables; it is preserved and stored for home consumption. Women's produce were often sold at farm gates or local markets at lower prices, for income to supplement household diets. Men are responsible for allocating staple foods used in the household for meal preparation to women; women are expected to provide other ingredients needed to accompany the supply of staple food provided by men. Although women prepare household meals, men receive lion's share of nutrient-dense portions of meals.

Conclusion

The local food system is heavily dominated by gender-driven socio-cultural norms, which constitute a barrier to women achieving dietary adequacy. Interventions are needed to improve women's diets; such interventions should deliberately address these culturally-established barriers, in contexts where subsistence farming is the main source of livelihood.

1.0 Background

Low dietary quality is a driver of all forms of malnutrition; it is a global public health challenge that exerts adverse consequences on human health and wellbeing (1, 2) (3). Children and women of reproductive age (WRA) are the most vulnerable groups to low diet quality (3). In sub-Saharan Africa, at least 10% of WRA are under-nourished and over 40% are iron deficient (4). In Ghana, there is a high prevalence of anaemia among WRA (42%) at the national level. The anemia rate is almost 50% in Northern Region (5). Low diet quality has been linked with maternal anaemia (6–8).

Women's diets are important, particularly, during adolescence, conception, and lactation. Optimal maternal diets contribute to improved health and nutritional status of both mothers and children (9). On the contrary, low-quality diets reduce women's ability to ensure that their household members, particularly children, consume good-quality diets since women exert a lot of influence on family meals (10).

Socio-cultural norms related to women's social status, access to productive resources, and decision-making power are linked with women's ability to effectively leverage the food system for optimal diets (1, 11–13). Identifying, understanding, and characterising the basic socio-cultural norms that shape women's dietary behaviour is, therefore, crucial to guide the design and implementation of culturally appropriate interventions that address women's dietary challenges and ultimately, contribute to addressing the high burden of malnutrition (14).

In addressing women's dietary and nutritional challenges in Ghana, socio-cultural norms have not been prioritized by policymakers. Socio-cultural norms are beliefs, attitudes, and practices that influence the way of life of a community and serve as ways to determine what is appropriate or otherwise. Existing nutrition-related interventions focus mainly on the immediate causes of under-nutrition; The role of socio-cultural norms in the food system has been ignored (15). The need to recognize the role of socio-cultural norms is particularly high in rural Northern Ghana, where women play multiple important roles in the food system (16). Women are particularly essential, for services such as providing labour for planting, harvesting, and processing in subsistence farming (7, 11); however, their diet quality is often sub-optimal (8).

This article describes an exploratory study conducted to understand the socio-cultural context in which women's lives and roles are constructed within the local food system. In this study, the food system is conceptualised as comprising all elements and activities pertaining to the production, processing, distribution, preparation, and consumption of food (17–19). The study also examined how these norms adversely affect the diets of WRA. Understanding these sociocultural norms can serve as a useful guide for designing interventions that improve dietary quality, and ultimately nutritional status.

2.0 Methods

Study aim, design and setting

The study aimed to identify and describe socio-cultural perceptions and practices and how they influence processes across all five components of the food system. A qualitative approach, involving focus group discussions and key informant interviews was employed. Data for the study were obtained from two, purposively, selected communities (Yilkpene and Kpachilo) in Savelugu-Nanton District in Northern Region of Ghana. Savelugu is the administrative capital of Savelugu-Nanton District. Both communities are rural, have a traditional and patriarchal orientation, and agrarian. Previous interactions with the two communities as part of an earlier study had yielded information on the socio-ecological context of women's nutrition (20), which was useful for the current study. The two communities were similar in population size, and also availability and access to social services.

Data collection, management, and analysis

Key informant interviews and focus group discussions were held with diverse participants (community members, traditional leaders and elders, community health volunteers, and traditional birth attendants (TBAs), as well as local government officials in agriculture, nutrition, and health). These respondents were selected because they were considered knowledgeable about the local food and health system. An interview guide was developed, tested and used for all the key informant interviews and the focus group discussions.. Separate focus group discussions were held with men, WRA, both in-school and out-of-school unmarried adolescent girls aged 15 to 19 years, and elderly women (50 years and above).

Data collection was done, mostly, using the Dagbani language. The interviews focused on beliefs and practices related to the local food system. Interview notes from each day's interviews were coded to identify relevant questions that required further exploration during subsequent interviews. Preliminary analysis was done simultaneously with data collection, enabling the opportunity to refine the questions in response to findings, to summarize what was said during the interviews (21) and to determine data saturation.

Thematic analysis (22) was used to explore how gender issues across the food system influence the quality of women's diets. Six steps were employed in thematic analysis - familiarization; generating initial codes; searching for themes; reviewing themes; defining and naming themes and producing results. The transcripts were read, thoroughly, taking note of the most frequently used expressions as a basis for generating themes; key issues were coded systematically across the entire transcripts. Audio records of interviews were transcribed verbatim and these transcripts were collated and assigned to each code.

Using the inductive approach, all the coded responses were collated into themes and sub-themes. Socio-cultural norm influences on the components of the food system were the a priori themes that guided the analysis and also constituted the major themes. The themes and emerging subthemes were defined as shown in Table 1.

Table 1
Themes, sub-themes and their working definitions

Themes	Sub-themes	Definition
1. Food production	Access to productive resources	All activities and decision-making involving the acquisition of farming resources for men and women
	Roles in farming activities	Specific roles for men and women during farming and post-harvest activities
	Types and uses of foods produced	Crops cultivated and predominant use (for cash or consumption
2. Processing including preservation and storage		Post-harvest activities to ensure crops are managed adequately to enhance their shelf life and quality of produce
3. Distribution	Channels of distribution	The different ways farm produce is distributed from the farm
	Intra-household allocation and provisioning of food	Allocation of grains and responsibilities for providing household food need
	Food insecurity and coping strategies	Times of food insecurity and what strategies are put in place to reduce the negative effects of food insecurity
4. Preparation	Food preparation	Responsibility for food preparation at the household level
	Decision-making regarding what to eat	Who decides on what to eat at the household level
	Food sharing arrangement	How food is shared among the different groups of members of the household
5. Consumption		Patterns of food eating arrangements at the household level

3.0 Results

3.1. Participants’ socio-demographic characteristics

Table 2
Participants' socio-demographic characteristics

Socio-demographic Characteristics	Total =103 (%)		
	Male	Female	Total
Sex	39(37.8)	64(62.2)	103 (100)
Age (years)			
15–19	0	15(23.4)	15 (14.6)
20–49	27	41(64.1)	68 (66.0)
50+	12	8(12.5)	20 (19.4)
Marital status			
Single	2(5.1)	18(28.1)	20(19.4)
Married	37(94.9)	46(71.9)	83(80.6)
Women's groups			
Pregnant		5(7.8)	5(7.8)
Lactating		19(29.7)	19(29.7)
Nonpregnant none lactating		17(26.6)	17(26.6)
Adolescent girls		15(23.4)	15(23.4)
Elderly women		8(12.5)	8(12.5)
Education			
None	17(43.6)	46(71.9)	63(61.2)
Non-formal	2(5.1)	0	2(2)
Primary	1(2.6)	6(9.1)	7(6.8)
JHS/Middle	2(5.1)	10(15.6)	12(11.7)
Arabic	10(25.7)	0	10(9.7)
Secondary +	7(18)	2(3.1)	9(8.7)
Occupations			
None	0	23(16.3)	23 (9.1)
Informal sector	35(89.8)	39(79.6)	74(84.1)
Formal sector	4(10.3)	2(4.1)	6(6.8)
Note: The exchange rate in 2017 was 1US$ to 4.2 GHC			

Socio-demographic Characteristics	Total =103 (%)		
	Male	Female	Total
Mean monthly income in GHC (US$)			
Informal sector	201.98(48.0)	59.00 (14.0)	126.63 (30.15)
Formal sector	1400.00 (333.3)	1350.00 (321.4)	1383.34(329.2)
Number of children			
None	3(7.7)	17(4.1)	20(5.7)
1 – 4	13(33.3)	16(32.7)	29(33)
5 – 15	23(59)	31(63.3)	54(61.4)
Sizes of households			
5 – 19	18(46.2)	43(67.2)	61(59.2)
20 – 35	21(53.9)	21(32.8)	42(40.8)
Note: The exchange rate in 2017 was 1US$ to 4.2 GHC			

Table 2 presents the socio-demographic characteristics of the study participants. Females dominated (62.2%) the sample of 103 study participants. Less than half of the participants (41%) were between the ages of 20 and 50 years. The majority were married (80.6%) and about 61% had no formal education. The majority of participants are farmers and petty traders (74%) with a mean monthly income of GHS 126.63 ($30.1); only a few (n=?) worked in the formal sector and these earned relatively higher average monthly income (GH 1,383.43; $329). The majority of participants (61.4%) had between 5 and 15 children. The household, which consisted of multiple nuclear families, had a mean size of 18.

3.2. Food production

There were three sub-themes relevant to the link between food production and socio-cultural norms: access to productive resources, participation in farming activities, and types and uses of foods produced.

Access to productive resources

There is low agricultural productivity among women, owing to cultural practices that systematically limit their access to land, labour, and capital for procuring inputs/technology (such as seeds, farming implements, chemical fertilizers, transport facilities, pesticides and herbicides). The limited access to land derives from living in a patriarchal society where married women are no longer considered be belong to their fathers' household. Instead, they are considered to be a part of their husbands' household. Thus, allowing them inheritance to their fathers' or family land is considered as land loss that will benefit the family they are married into. A married woman could, however, have access to a small portion of her husband's farmland, or lease land, from neighboring communities, if she had the financial resources for

farming activities. Further, women's capacity to engage in farming activities was hindered by their inability to procure labour or receive fair compensation for labour.

Roles in farming activities

Traditionally, women are expected to contribute labour for their husbands' farms. However, the reverse is not practised. Ill-health is the only plausible reason why a wife could not help her husband to harvest his crops, as expressed by a male focus group participant:

"As for your wife, it's a must for her to come to the farm and help. If she doesn't come, who else can come? The only reason your wife can't come to help you harvest is ill health. In that case, she wouldn't be at fault and her portion will be reserved. But if she refuses to come for any other reason, well, it has never happened before. She must be on the farm" (FGD, K 31 Men).

When women's labour was hired by other households for farm work such as harvesting crops, they are paid in kind (food), whereas men are paid in cash. Additionally, men could hire labour and pay for it using income from the sale of farm produce. Women are unable to hire labour because they are limited by their low farming income.

Women help their husbands to plant crops, cook for hired farmworkers, harvest produce, and carry it home. Other farming activities such as preparation of land for planting and making of beds and mounds for the planting of yam and cassava are reserves for men because such activities are perceived to be beyond women's physical strength.

Foods production and disposal

Both study communities reported that food crop production is mainly for home consumption. Crop production is the main livelihood of the communities; livestock farming is a supplementary livelihood activity. The type of crops produced differed based on their differential access to productive resources. Also, the types of crops produced were linked with the perceived physical energy that males and females need for their production. Men typically cultivated and controlled staple crops intended for home consumption. However, when they produced nutrient-rich legumes like groundnut, cowpea, Bambara beans, and pigeon pea in large quantities, these were often sold for income. Men also dominated in the production of crops with high-market value such as tomato, pepper, rice, and cashew-nut. A few women produced cash crops such as rice, soya bean and okro. In the past, "kanton" (cotton seed), "neli" and "agushie" (both melon seeds), yam and millet were important cash crops in the two communities, but their cultivation has dwindled due to unfavorable weather conditions. A male participant lamented as follows:

These days, "kanton" isn't in great supply. Very few people cultivate it...Yes, and "neli", yam and millet too aren't being cultivated in large quantities because the rains are poor and cultivating them has become a problem

(FGD men, Y35).

Seasonal nutrient-rich vegetables and fruits which are harvested from the wild, mainly by women, are not commonly cultivated. There is a perception that it is unnecessary to devote effort and resources to cultivating foods that are already available in the wild. Although men and women engage in livestock production, men control the utilization of livestock resources. A male key informant defended the practice as follows:

"In this community, men have total control over everything concerning livestock... She can't sell her livestock without the man's consent... The way a woman is, if you allow her too much authority today, tomorrow she'll ride on your back…" (KII Y24 Male).

Livestock is reared mainly for cash savings. It is used as food only on festive occasions, including naming ceremonies, marriages, funerals, and welcoming special guests.

3.3. Processing, preservation and storage of food

Table 3.1 shows post-harvest activities including food preservation by men and women.

Table 3
Gender-based roles in processing, preservation and storage of food

Post-harvest activities	Primary group
a) Husking grains-maize, rice, millet and guinea-corn	Women
b) Boiling paddy rice	Women
c) Milling rice	Women
d) Drying grains in the sun	Both men and women
e) Processing legumes, shea-nut and dawadawa (African locust bean)	Women
f) Drying legumes, shea-nut and dawadawa in the sun	Men and women
g) Drying vegetables- e.g., pepper, okro, bra	Women
h) Drying some root crops especially cassava	Both men and women
i) Storing produce mostly in food barns and silos	Men
j) Storing produces mostly in sacks	Women

Women have primary responsibility for all food processing activities. Women are also responsible for boiling and milling rice, and sun-drying vegetables such as pepper, okro and leafy vegetables (bra, Kuka) to extend the shelf-life. Produce by women are usually stored in sacks which offer inadequate protection against infestation by fungi (including aflatoxin), insects, and other pests. Thus, women are more likely to suffer post-harvest losses and to produce poorer quality farm produce. A female key informant explained the predicaments of women regarding post-harvest storage of their produce:

“After de-husking, we dry the maize and then shell it. The women bag their produce and store it in rooms but most men store their produce in silos. What you should know is that, once the maize is being put into silos, there’s no need to add chemicals to prevent weevils from spoiling the grains because the silos are air-tight. However, with the bags, you have to spray the produce with chemicals to prevent weevils and other insects from destroying them but the women are unable to afford such chemicals”(KII Y22).

Some activities were, however, performed jointly, including preserving and storing food produce and drying of grains, legumes, and some root crops (particularly cassava). Traditionally, men’s responsibility included storing household grains and other farm produce in food barns and silos (if they owned them).

3.4. Distribution of farm produce

Issues related to the distribution of farm produce involved the channels for transportation of farm produce to buyers, intra-household food allocation, and associated coping strategies.

Channels of distribution

Cash crops produced in the two communities are sold at prices determined by both men and women. The sale is done at farm gates, local, and urban markets. Women carry their produce on their heads to the local markets for sale; therefore, they exert a lot of effort (energy expenditure) in the distribution of their produce. On the other hand, men are more likely to use bicycles, motorcycles, and other motorised vehicles to transport farm produce to the urban markets.

Intra-household allocation and provisioning of food

Traditionally, men control food resources at the household level; the traditional practice is that men allocate stored grains for household food preparation to their spouses, on a weekly basis. In polygamous households, grain allocation is given only to the wife whose turn it is to prepare meals. It is forbidden for women in the communities to enter food storage barns to take grains for the preparation of meals. This is because men regarded women as inept stewards of food stores. Some men indicated that the allocation of grain is usually planned with women. They indicated that the quantity of grain allocated is determined jointly by men and women.

While some women agree with men that women are poor stewards of stored food, others rejected this perception. A female participant at Kpachilo supported the practice of the “no entry for women” tradition, indicating that this arrangement makes men responsible for replenishing barns:

“It’s to the benefit of us all. This tradition prevents us, women, from misusing the grains until it’s time to farm again for new foodstuffs. But if women are allowed to manage the barns and the foodstuffs are finished and the man isn’t able to provide any, then she’ll be the very person to provide grains. That’s what we don’t want. That’s why we’re according the men that respect to fetch the grains for us to cook” (FGD K27 Females).

One of the main reasons given by some women who opposed this food allocation tradition is that it limits their ability to obtain enough grain to meet all their food needs to adequately feed their households, since they are not in a position to determine how much food will suffice, for various circumstances.

Despite their limited access and control over household food resources, women are expected, traditionally, to provide a complement (ingredients for the soup) to the grain provided by men for household meal preparation. Thus, while men are responsible for providing the staple (grain) component of household meals, women are expected to provide the ingredients needed for preparing soup, including anchovies (small herrings), salt, onion and bouillon cube. One female key informant explained the responsibilities of men and women regarding the provision of food for households:

"It is also not his responsibility to give you money to buy ingredients to prepare soup. His responsibility is just to provide grains for you. So, we use our own money to prepare soup. The piece of land they apportion to us to farm on is where they expect us to get funds for ingredients. When we plant groundnut, we also plant okro so that when they both mature, we can sell and consume some at home" (KII Y26 Female).

Food insecurity and coping strategies

Women's access to optimal diets is affected by seasonal food shortages. Participants reported that some staple foods, particularly cereals and legumes are usually available throughout the year. On the other hand, seasonal foods like vegetables (including green-leafy vegetables) and fruits are only available for brief periods in the year, unless they are processed into dry products. The availability of food in the household depends on the adequacy of rains for production, as well as the storage of grains from the previous farming season. Food is most abundant during the harvest period. Key informants reported that during the period between September and February, all crops, with the exception of green leafy vegetables, are abundant at the household level. However, the period between April and August is a lean season, characterized by food shortages. The lean season is when food crops have been planted and are awaiting harvest. Therefore, although fresh leafy vegetables are available, the main staples (maize, guinea-corn and groundnut) are, typically, in short supply.

In both Yilkpene and Kpachilo, men employ similar coping strategies during periods of food shortage, including decreased meal frequency and portion size, increased buying of staples from the market, and borrowing grains from neighbours who have enough food to spare. Purchase of additional grain is done using incomes earned from casual labour, sale of livestock, groundnut, pigeon-peas, cowpeas, and soya bean. During periods of shortage, men reduce the quantity of grain that is allocated for preparing the household meal.

Although the use of bouillon seasoning in soups and sauces is common, during the lean season, women cope by finding ways to enhance the palatability of meals, by increasing the use of bouillon seasoning. Generally, men reported dislike for the use of bouillon seasoning in meals, because they believe bouillon causes male sexual impotence. However, they are unable to restrict women from using it. Additionally,

women complement men's income by selling shea-nut, firewood, or personal effects (such as clothing); or migrating to Southern Ghana to work as head porters, during the season after harvest. Additionally, resources from remittances and support from non-governmental organizations (NGOs) serve as additional support during periods of insufficient food resources.

3.5. Food preparation

Preparation of food for the household involves decision-making about what to eat, sharing prepared food, and consumption arrangements within the household. Traditional practices about preparation and sharing of food limit women's dietary quality.

Decision-making regarding what to eat

A typical meal in these communities comprises Tuo Zaafi (TZ), a thick porridge-like dish prepared from maize (and sometimes with cassava) flour and accompanied with a soup made from a variety of vegetables. Within households, there is a hierarchical system of power among women, which is exercised when making decisions regarding food preparation. Older wives are responsible for the preparation of major meals such as lunch and dinner, while younger wives are responsible for preparing breakfast. The decision to eat a particular dish is a joint decision arrived at between men and women. The female participants in the focus group discussion sessions indicated that this decision depends on the kinds of foodstuffs provided by men. However, women determine the soup and other sauces that accompany the main staple.

Food sharing arrangements

When serving meals, the traditional practice is that women serve their portion first; thereafter, the meal portion of the head of household is served, then elderly women, young men, young women and lastly, children. During a female focus group discussion at Yilkpene, participants explained that, although women serve themselves first, after cooking, they do not eat first:

"The fact that we serve our bowls before other household members doesn't imply we get the lion's share or we're the first to eat. No! We only put a little into our bowls simply because we cooked the food and want to be sure it's good enough to be consumed by other members of the household" (FGD, Y34 Females).

Sharing of meat is done by the male head of the household or elderly men at both the household and community levels. Similarly, during social occasions, meat (whether raw or cooked), is usually shared by elderly men. A female participant narrated the process of sharing meat among members of a household:

"You see the thighs and breasts of the fowl, they go to the elderly men. Then the neck and wings go to the young men. The back and waist go to the women and the legs and head go to the children. The bony part is given to us women because we need stronger bones to carry the next generation of children." (FGD, Y34 Females).

3.6. Food consumption

Participants reported that patterns of social interactions, during mealtime, are determined by gender and age. Wives usually eat together; others such as older women, young women or girls, young men and children eat together within their groups. Male heads of households eat alone. If there is only one elderly woman, she also tends to eat alone. Usually, women are the last to eat after everybody else is satisfied and would not need additional food. Furthermore, if visitors arrive without prior notice at mealtime, the woman's food is often offered to them - thus, leaving her with little or no food at all. One female participant at Yilkpene, however, explained that a woman never goes to bed on an empty stomach as she always manages to get some leftovers from other members of the household after they have all eaten to their satisfaction. The following quotation from a female participant sums up what women go through when it comes to food consumption:

"The fact that we serve our bowls before other household members does not imply we get the lion's shares or we're the first to eat…We only put a little in our bowls simply because we cooked the food and want to be sure the food is good enough to be consumed by the rest. After everyone else is served, whatever is left is added to our bowl. If nothing is left, then we resort to other people's leftovers. Sometimes, we even have to add ours to the children's if they don't have enough to eat. Even sometimes if we get unexpected visitors, our bowls of food are sacrificed for them, we can always manage to survive" (FGD Women, Y34).

4.0 Discussion

This study focused on the five components of the food system. Socio-cultural norms within the food system constitute potential barriers to women's ability to achieve optimal diets. The study found patriarchy, gender-role stereotyping, and women's low socio-demographic characteristics, as the main socio-cultural barriers to women's diets in rural communities in Northern Ghana. These barriers affect all the five components of the food system and, thus, have adverse implications for women's dietary quality.

Patriarchy, a system of male dominance (23) emerged as the foremost socio-cultural barrier. This barrier was displayed as limited access to productive resources, sale of nutrient-dense legumes and control of overutilization of livestock resources, limited access of women to food barns and allocation of grains, restricting preparation of food to raw materials allocated by men, and involvement of mothers-in-law in making household food choices. Additionally, patriarchy is a barrier to women's diets through the sharing of meat by men such that men received choice parts of meat. Patriarchy, thus, contributes to restricting women's access to productive resources, particularly land, labour and capital, inadequate quantities and is a barrier against accessing diverse and nutritious foods such as legumes by women.

Low access to land derives from the tradition of restricting inheritance to male descendants (23, 24). This is because married women are perceived to belong to their husbands' rather than their fathers' households (25, 26). Not receiving support from husbands to lease land or to engage in other land and

financial transactions with external parties is another barrier to women. Similar findings have been reported in Sub-Saharan Africa and other parts of Ghana (11, 27, 28). In respect of accessing land, FAO (2012) reported that land sizes in Ghana are generally small; however, women tend to have less access than men. Additionally, physical environmental factors such as climate change, environmental degradation, deforestation, and bush burning activities, which result in reductions in the acreage of arable land, are further limited the sizes of land available to women (7, 29), thus, preventing them from producing a large variety of foods for their households.

Women's differential and disadvantaged access to labour, compared to men, in low-income countries has been well documented (30–32). Women's low access to labour emanates partly from their poor financial status and their lack of rights to male household members' labour (26). Women's low access to labour, hinders their production of labor-intensive crops such as root crops and legumes, which are important for alleviating poverty and contributing to reducing malnutrition, particularly among women of reproductive age and children (30).

The influence of patriarchy is well featured in the food sharing and eating traditions, leading to adverse quantities and quality of household diet. Pro-male sharing of food has been reported in other parts of the world (33–35). This practice has the potential of adversely affecting women's dietary intake and quality (13).

Gender-role stereotyping is a barrier to women's diets through their effects on women's roles in farming activities, provision of ingredients and staples, and food sharing and eating arrangements, and food shortage and coping strategies related to women's role as home-managers and providers of food (31). Some of the coping strategies that are barriers to women's diet adequacy include reduction of grain allocations, frequency of meals, and size of meal portions. Gender-role stereotyping makes obliges women to provide food for their households at all costs, including sacrificing their portions of food, in times of food shortage, or giving up their portions to unexpected visitors.

The strategies adopted by women to mitigate the effects of food shortage have been reported elsewhere including Ghana (6, 35, 36). The Office of the United Nations Human Rights division recognizes gender-role stereotyping as a major obstacle to women's development including their health and nutrition. The report emphasizes that stereotyping women's role within the family results in division of labour, which also leads in time to poverty and lower educational attainment for women (37). Cooking for large families could exert a heavy toll on women financially, physically and psychologically - with potentially adverse effects on their diets and health and those of their children and families (38).

Gender-role stereotyping may serve as a barrier to the diets of women. This stereotyping includes the perception of women as incapable of certain physical activities including the preparation of land for planting and making of mounds for yam and cassava and the perception of women as unworthy of much authority –as in control and utilization of livestock resources. The current study's findings resonate with others in East Africa where masculine pride is associated with exerting hard physical strength/labour while feminine pride relates with less physical labour and helping roles (30). These stereotyped roles may

explain why women in northern Ghana dominate in producing vegetables and gathering wild fruits for home consumption, leaving cash crop production mostly to men (32). This perception limits women's ability to produce and have control over a variety of staples and nutrient-dense foods. The United Nations Human Rights Division advocates consideration of this kind of stereotyping as "wrongful" since it is a violation of the fundamental rights of women (37).

The negative-attribute stereotyping of women that relates to food distribution includes the perception of women as poor managers of stored food. This stereotyping bars women from entering food barns to fetch grains, based on the unfounded belief that a woman who enters any barn to fetch grains risks giving birth to future thieves. Similarly, negative stereotypes that constitute barriers to women's diets include the perceptions that women cannot be trusted to share meat fairly, that they are ignorant of specific parts of animals that should go to the various categories of members of households and the belief that women deserve the bony parts of animals to enhance their performance of the reproductive role.

The main aspects of women's socio-demographic backgrounds that are barriers to their diets are low educational attainment, low levels of productivity, high dependency, and low- or irregular-income earnings. Women's low educational attainment affects their poor dietary knowledge, attitudes and perceptions, and capacity to cultivate seasonal nutrient-rich vegetables and fruits, which are harvested from the wild. Low levels of women's agricultural productivity are due to poor access to transportation, and excessive demands on women's time for domestic chores (including childcare, cooking, fetching firewood and water) (26). These barriers influence women to sell their farm produce at cheaper rates at the farm gates, far below the market value. Such transactions, perpetuate poverty among women, which, in turn, deprive them of access to quality diets.

Women's relatively lower incomes hinder their capacity to perform traditionally assigned roles related to food provisioning. Such roles include acquiring the ingredients needed for preparing soups, which, in most cases, are more expensive than accessing grains (39). This barrier leads to poor quality diets for women and their households. Poverty among women is also a barrier to their diets, through its links with storage of produce in pest-prone bags, thereby exposing women victims to post-harvest losses and poor-quality produce; low access to seasonal foods such as vegetables, and legumes; rearing animals mainly for cash savings instead of home consumption and using livestock as food only during festive occasions and for welcoming special guests.

Patriarchy, gender-role stereotyping and women's sub-optimal socio-demographic backgrounds, are thus, the main barriers to women's diets quality, availability (quantity) and affordability. Addressing these socio-cultural barriers, identified in this study could decrease levels of malnutrition, ill health, and improve the lives and livelihoods of women, their children and families. Ultimately, such interventions can contribute to improved sustainable quality diets for all (38).

The barriers related to patriarchy may be the most difficult to address because the close integration between cultural perceptions and practices of authority, power and control, and property rights are linked

with religious practices, making it difficult to alter behaviours. Context-appropriate cultural negotiations with various stakeholders, including a role by the State, custodians of tradition and communities, and legislation similar to PNDC Law 111 (24) may be useful to give women equitable rights to land inheritance and acquisition. Although gender role stereotyping is entrenched, there is room for negotiation that emphasizes the role of the nuclear family at the expense of the extended family system.

There is the opportunity for enhancing autonomy for women through enhancing women's educational attainment and low-income levels. Socio-economic empowerment programmes that target women, deliberately, are needed to reduce their dependency and promote educational attainment and create awareness on issues related to health and nutrition.

To ensure that results of the study are trustworthy and reflect participants' views of issues, a presentation of preliminary findings were made to community members at a durbar to reach a consensus. Second, the themes generated were reviewed by two other authors (RA and MAK). The results of the study should, however, be interpreted bearing in mind that two communities in only one rural district in Northern Ghana were selected for data collection. Even though communites in Northern Ghana are mostly male-dominated and, inheritance, particularly of landed property, is through the male-line only, there may exist substle differences in the level of women's participation in the local food system which may affect women dietary quality differently from what is reported in the current study. There is, therefore, the need to carry out similar studies in more coomunities to ascertain transferability to other regions and ethnic groups in Northern Ghana.

5.0 Conclusions And Recommendations

Women participate actively in all aspects of the food system but their access to dietary adequacy and quality may be hindered by gender-driven socio-cultural perceptions and practices. Absolute respect for tradition engenders biases that favour men; women's low education and earning capacity serve as additional barriers. These barriers need to be deliberately dismantled through community-based participatory interventions aimed at ensuring optimum diets for women. This approach is particularly relevant in patriarchal settings, where agriculture is the dominant source of livelihood.

The findings suggest that a participatory community-based social behaviour change communication intervention will be necessary to target and address the identified socio-cultural barriers to women's diets in Northern Ghana. An appropriate intervention should focus on local (community) rather than nationwide efforts. Such interventions should also employ the principles of andragogy (facilitation of programmes for adult learners) such as utilizing participants' personal experiences and a homogenous group of participants to discuss relevant issues. The participatory approach would attract the cooperation and attention of the end-users throughout the intervention.

6.0 Declaration

***Ethical approval and consent to participants**:* Ethics approval was obtained from Noguchi Memorial Institute for Medical Research (NMIMR), University of Ghana, (Reference No. (CPN): 077/15-16). Additionally, permission was obtained from the traditional leaders of the two selected communities and and also from individual participants.

Availability of data and materials: The dataset used during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

Funding: No funding was received from external sources. The corresponding author soley funded the study from personal sources.

Authors' contributions: ZAS: conceptualised the problem, designed the study, collected data, trained data collectors and supervised transcription, analysed data, wrote and intrepreted the results. AR: Refined the conceptualization of the problem, supervised the design, analysis and interpretation of findings and reviewed the entire manuscript. AA and TK contributed to refining the study design, supervised data collection, analysis and interpretation of results and edited the manuscripted. AKM contributed to conceptualising the problem, presentation of results and discussion and reviewed the entire manuscript.

Acknowledgements: Our gratitude goes our data collectors and transcribers who who ensured that good quality data were gathered and to Mr. Kweku Abankwa, for his professional editorial services for the entire manuscript.

Authors' information (optional): **RA, AA and TK,** all professors from the School of Public Health, University of Ghana, were the supervisors of the first author **(ZAS)** during her Ph.D. The current manuscript is one of three articles they wish to contribute to publishing ZAS's thesis. **MAK** was the former Head of Department of Nutrition, Noguchi Memorial Institute for Medical Research, University of Ghana, where **ZAS** worked as her mentee. Her previous qualitative studies in infant and maternal nutrition informed the conceptualization and design of her thesis.

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