Research Journal of Food Science and Nutrition
Volume 7(3), pages 68-77, August 2022
Article Number: 53DC7C271
ISSN: 2536-7080
https://doi.org/10.31248/RJFSN2022.146
https://integrityresjournals.org/journal/RJFSN

Full Length Research

A qualitative exploration of knowledge, practices and training needs on the safe use of cooking salt among national home-grown school feeding programme food vendors in Southwest Nigeria

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Received 8th July 2022; Accepted 18th August 2022

ABSTRACT: This study assessed the knowledge, practices and training needs on the safe use of cooking salt among food vendors engaged in the National Home-Grown School Feeding Programme (NHGSFP) in Southwest Nigeria in order to inform tailoring of appropriate capacity building interventions. An exploratory qualitative study was conducted among 40 purposively selected food vendors engaged in NHGSFP in Oyo and Ogun States. Data were collected using a pretested key informant interview guide which contained information on knowledge of cooking salt, practices usually employed to ensure that school meals contain moderate salt, sources of available information on the use of cooking salt, previous training on the use of cooking salt and dispositions to being trained on the use of cooking salt. Data were tape-recorded and subjected to thematic analysis. Participants mentioned various health problems of excessive salt intake including hypertension and heart diseases. Practices food vendors usually indulge in to ensure moderate use of cooking salt in school meals include 'gradual adding of salt to taste', 'reliance on personal discretions and aroma of meals'. Pre-employment orientation programme organized by the NHGSFP officials constituted the major source of information on cooking salt use. Other pertinent sources of information included mass media and adverts. Some food vendors emphasized that they were not specifically taught on cooking salt use. Participants commonly expressed willingness to be trained on safe use of cooking salt and acknowledged that such training would help them. Knowledge and practices on issues relating to safe use of cooking salt for preparing meals remained inadequate among the food vendors. Implementing training on the use of cooking salt and other condiments in preparation of school meals was considered essential towards promoting safe salt intake and reducing risk of cardiovascular disease among school-age children. Training intervention for food vendors which adopts sustainable strategies is recommended to address the phenomenon.

Keywords: Food vendors' salt use practices, knowledge of salt intake, school meals, school meals preparation, training on safe use of cooking salt, use of condiments.

Abbreviation: MO, Morenikeji Olawuwo; **DS,** Dolapo Salisu; **AOO,** Akintayo Olamide Ogunwale; **IOA,** Ikeoluwapo Oyeneye Ajayi; **OEO,** Oyediran Emmanuel Oyewole.

INTRODUCTION

The National Home-Grown School Feeding Programme (NHGSFP) is a strategy adopted by many national governments including Nigeria to contribute to the achievement of the Sustainable Development Goals (SGDs) related to food security, nutrition, education, health and agriculture (World Food Programme, 2018; Food and Agricultural Organization and United Arab Emirates University, 2019). In 2016, at the 26th session of the African Union Assembly, the African Heads of State declared NHGSFP a strategy to improve education, and boost smallholder agriculture and overall local economies (African Union, 2019). The NHGSFP has also been affirmed as an initiative that directly and indirectly contributes to the accomplishment of African Union Agenda 2063 aspirations 1, 3, and 7 (African Union. (2021).

In Nigeria, the NHGSFP is a government-led 70 Naira per day school feeding initiative that aims to improve the health and educational outcomes of public primary school pupils. It uses farm produce locally grown by smallholder farmers to provide nutritious mid-day meals on everyday school day to pupils. The programme provides empowerment opportunities to several farmers, food processors, youths, women and food vendors in the beneficiary community (National Social Investment Office, 2016). According to the World Food Programme (2019), Nigeria's national homegrown school feeding programme directly employed 95, 000 women across the country.

The programme was first pilot-tested in 2004 in 12 states across the six geo-political zones of Nigeria under the auspices of the School Health Unit of the Ministry of Education. Then, it was called the Home-Grown School Feeding and Health Programme (Jokogbola *et al*., 2020). The current NHGSFP commenced in 2016 as a component of the National Social Investment Programme and as of 2019 over 300 million meals had been served to more than 7.5 million pupils in 46,000 public primary schools in 22 states in Nigeria (National Social Investment Office, 2016; World Food Programme, 2019).

The NHGSFP has been reported as an initiative that increases attendance and enrolment, reduces dropout rates, and ensures that children are attentive and thus learn and perform better (Oyefade, 2014; African Union, 2019; Bosah *et al*., 2019). Despite the potential benefits and some of the achievements of the NHGSFP, several challenges have been observed. For instance, some previous studies conducted by Civil Society Action Coalition on Education for All (2018) and Action Health Incorporated (2020) reported a number of NHGSFP related challenges in Oyo and Ogun States such as political interference, ineffective monitoring of activities, exclusion of pupils in primaries 4 to 6, frequent changing of food vendors, illiteracy rates among food vendors involved in NHGSFP as well as low quality and quantity of meals.

The quality of the meals consumed has the potential to affect the health of the pupils exposed to such meals. Currently, anecdotal information and research findings such as Dani and Ajayi (2018) and Odili *et al*. (2020) revealed a high intake of salt among Nigerians including children above the recommended level in the new global 2015-2020 dietary guidelines. There is the possibility of high dietary salt intake from school meals because there is no standard guideline provided to food vendors and no substantiated monitoring of salt content in school meals; with subsequent risk of high blood pressure. Exposure to meals with high salt content in schools may affect the taste bud and reconfigure it; making such pupils develop an appetite for high salt containing foods even outside the school. Since these pupils are like captured audience in a school setting, a generation for the future may already become exposed to the risk of cardiovascular disease unknowingly through consumption of foods served in schools under NHGSF programme.

Nutrition educational interventions in form of capacity building for food vendors on issues relating to use of cooking salts in preparing school meals as parts of salt reduction strategies are crucial for preventing exposure of school children to high intake of salt and its associated health problems. Up till, now little is known about knowledge, practices and other antecedent factors relating to use of cooking salts among school vendors involved in NHGSFP especially in southwestern Nigeria. Knowledge and practices of food vendors on dietary salt related issues can help to drive the design of possible interventions to stem consumption of excessive salt in meals. This study was, therefore, designed to determine the knowledge and practices of cooking salt use as well as assess the training needs of food vendors on issues relating to use of cooking salt in school meals prepared for primary school children in Ogun and Oyo States in southwestern Nigeria.

MATERIALS AND METHODS

Study setting

Southwest Nigeria is one of the geopolitical zones of Nigeria, comprising Ekiti, Ondo, Osun, Lagos, Oyo and Ogun States. The area lies between longitude 2° 31' and 6° 001' East and latitude 6°21' and 8°37' N (Agboola, 1979) with a total land area of a total land area of 77,818 km^2 as well as a population of 35, 877,260 as at 2016 (National Bureau of Statistics, Nigeria, 2017).

Besides Lagos State with a population of 12,550,598, Oyo and Ogun states, where this study was carried out, are the states with the highest populations in Southwest Nigeria with figures of 7,840, 864 and 5,217,716 respectively (Odili *et al*., 2020). Data from the most recent Nigeria Demography and Health Survey reported primary school attendance rates of 72.7% for southwest Nigeria;

68.0 and 72.4% for Oyo State and Ogun States respectively (National Population Commission and ICF, 2019). Despite the fairly higher enrolment rates of school-aged children in southwest states including Oyo and Ogun States compared to the rates in the Northern parts of Nigeria, the school enrolment in the southwest states is yet to achieve the targets of universal basic education and SGDs (National Population Commission and ICF, 2019). According to a previous study conducted by Gambo and Adelokun (2020), the projected numbers of pupils in public primary schools in Oyo and Ogun States for year 2021 were 506,348 and 460,064 respectively.

The NHGSFP took off in both Oyo and Ogun States in January 2017 across 2,408 and 1,510 public primary schools in the states respectively (Civil Society Action Coalition on Education for All, 2018; Action Health Incorporated, 2020). A study previously conducted by Action Health Incorporated (2020) in Ogun State noted that 2,779 direct jobs were created for cooks (all women) in the food supply chain in Ogun State through the NHGSFP. Similarly, the study carried out by Civil Society Action Coalition on Education for All (2018) in Oyo State noted that 2,578 food vendors (all women) were engaged in the NHSGSP in Oyo State.

Study design and population

An exploratory qualitative study using Key Informant Interviews (KIIs) was conducted among food vendors engaged in NHGSFP in Oyo and Ogun States.

Sample size and sampling

The KIIs were conducted among 40 food vendors (20 food vendors each in Oyo and Ogun States) that were purposively selected from various public primary schools engaged in the NHGSFP in Oyo and Ogun States. For the sake holistic views and representativeness, efforts were made to achieve geographical dispersal of interviewees across the various Local Government Areas (LGA) and senatorial districts in each state. Interviews were conducted up till the point of saturation.

Data collection

The food vendors were interviewed using a validated researcher-designed KII guide. The instrument was used to elicit information relating to participants' knowledge of health problems that can be associated with excessive intake of cooking salt, knowledge of how excessive use of cooking salt in food preparation can be controlled, practices usually employed to ensure that school meals contain just moderate salt, sources of information available on the use of cooking salt in food preparation, previous training on use of cooking salt and other food seasoning for cooking school meal and dispositions to being trained in the use of cooking salt use in food preparation. The KII guide, which was originally designed in English language and then translated into Yoruba and back-translated to English, was pre-tested in each of the states among three food vendors in LGAs not selected for the main study.

Twenty trained research assistants comprising both males and females were engaged in each of Oyo and Ogun States to conduct the KIIs. The research assistants were all graduates who had previous experience in qualitative research. The research assistants were exposed to a 6-hour intensive training in each of the study sites and inter-observer rate was at least 80%. Their training comprised acquaintance with the study methods, data collection instrument, practical sessions on interviewing skills, note-taking and transcription of recordings.

Each KII entailed asking open-ended questions and this was conducted on a one-on-one basis in a place and time of convenient for the interviewee by a pair of research assistants. A research assistant served as moderator while another was responsible for note-taking, observing and documenting the interview process and non-verbal cues of an interviewee. All the interviews were audio-taped, and notes were taken. Each interview lasted 40 to 60 minutes. The interviews were held to the point of saturation.

Data analysis

Data processing started with the verbatim transcription of tape recordings of the KIIs which was within 24 hours after the data were collected to avoid loss or omission of important details. Additionally, the interviews that were conducted in Yoruba were subjected to forward-back translation to English. The transcribed notes were audited and validated by two project team members (MO, DS) and the data analyst (AOO). Validated transcribed notes were entered into the computer using NVIVO version 12 Pro. Inductive-dominant coding approach was used to drive the coding process (Armat, 2018). Primary codes and secondary codes were generated based on the content of the data. The codes were linked appropriately to the corresponding quotations. Memos were created as necessary and linked with appropriate codes and quotations. The generated codes and the quotations were reviewed and critiqued carefully by the data analyst (AOO) and by two other experienced qualitative experts (IOA, OEO).

Thematic analysis was performed. Generated themes that facilitated the presentation of the findings were based on the (a) content of the study instrument (b) sample quotes from transcripts; and (c) peer review and reflections (contributions from members of the research team). Following Nowell *et al*. (2017) step by step approach to

thematic analysis, the verbatim transcript of each interviewee was carefully read and examined theme by theme in comparison with that of other interviewees to identify relevant texts, repeating words, similar phrases and divergent opinions. For each theme, common and peculiar trends, as well as similar and divergent opinions were noted. Themes were developed and revised iteratively. A summary of findings was written, and samples of appropriate verbatim quotes were provided.

Ethical considerations

Approvals to conduct the study were obtained from the Oyo State Ministry of Health Ethics Review Committee (AD 13/479/1645[B]) and Ogun State Ministry of Health Ethics Review Committee (HPRS/381/332). Written informed consent was obtained from each of the participants prior to being involved in the study. There was no risk or harm to participants in this study. Interviews were conducted either in a quiet environment within the schools where participants work after school closing hours or in other convenient places within their communities where their privacy was guaranteed. All transcribed notes were stripped of personal identifiers. Confidentiality was maintained and access to data was restricted to only research team members.

RESULTS

Socio-demographic characteristics of participants

All (100.0%) of the food vendors involved in the KIIs were females. The mean age of participants was 43.54 ± 28.72 years with a range of 28 to 60 years. Participants who had primary education and SCCE constituted 35.0% each. The participants had various primary occupations (initial occupation before or besides working as food vendors in the NHGSFP) including catering business (27.5%), selling foods to school pupils (22.5%) and petty trading (17.5%). The food vendors' mean duration of employment in the NHGSFP was 28.72 ± 20.98 months. Details of the socio-demographic information on participants are shown in Table 1.

Table 1. Socio-demographic information of participants (N = 40).

Characteristics	n (%)
Sex	
Females	40 (100.0)
Males	0 (0.00)
Age group* (in years)	
≤ 29	3 (7.5)
30 – 39	9 (22.5)
40 – 49	16 (40.0)
50 – 59	11 (27. 5)
≥60	1 (2.5)
Highest level of education	
No formal Education	4 (10.0)
Primary Education	14 (35.0)
JSCCE	1 (2.5)
SSCE	14 (35.0)
NCE	5 (12.5)
OND	2 (5.0)
Primary occupation[β]	
Catering business	11 (27.5)
Selling foods to school pupils	9 (22.5)
Petty trading	7 (17.5)
Selling foods to school pupils/Catering business	5 (12.5)
Selling of food stuffs	2 (5.0)
Farming	1 (2.5)
Pepper grinding	1 (2.5)
Private tutor	1 (2.5)
Beer palour operator	1 (2.5)
Video club operator	1 (2.5)
No employment	1 (2.5)
Duration of employment as food vendor in the NHGSFP[+] (in months)	
≤ 12	14 (35.0)
13 – 24	4 (10.0)
25 – 36	8 (20.0)
37 – 48	10 (25.0)
49 – 60	4 (10.0)

NOTE: ***Age range = 28 – 60 years, Mean age = 43.72 ± 28.72. [β]initial occupation before or besides working as food vendor in the NHGSFP.** [+]Length of work experience as food vendor = 1 – 60 months, Mean = 28.72 ± 20.98 months.

Food vendors' knowledge of health problems that too much intake of cooking salt can cause

All the food vendors interviewed in both Oyo and Ogun States opined that too much intake of cooking salt in meals is not good and can cause health problems. Participants frequently mentioned excessive sweating (hyperhidrosis), sweaty palms and feet, and swelling of the body as the health problems that are associated with intake of too much cooking salt. Hypertension, diabetes, kidney problems, heart diseases and damage to vital organs of the body were also repeatedly mentioned. One interviewee confidently remarked that consumption of too much salt causes addiction to eating salty foods. Another interviewee disclosed that she learned that too much intake of cooking salt causes cancer. There were some instances where some participants revealed that consumption of too much cooking salt 'turns the blood in

the body into water' and causes the penis to be 'dripping water excessively'. On the contrary, a handful of interviewees in both Oyo and Ogun States declared that they do not know the health problems that can result from the intake of excess cooking salt.

If one eats too much salt, especially fat people it can cause excessive sweating. By not putting excessive salt in food, especially for male children, they must not eat excess salt (KII 16 Abeokuta North Ogun State).

Too much salt can lead to high blood pressure and diabetes (KII 3 Odogbolu Ogun State).

I have heard that too much consumption of salt is not good for the body. When salt is consumed excessively it makes blood turns into water and all sort (KII 7 Odogbolu Ogun State).

…If salt is too much for an adult, it causes hypertension, for a child, it damages the brain or can make the child develop heart disease (KII 11 Ipokia Ogun State).

Haa! There are many problems that salty food can cause to the body. Too much intake of cooking salt can cause diabetes and other problems in the body, for instance, some people may experience their palm be will sweating likewise their legs (KII 6 Mokola Ibadan Oyo State).

It can cause water to be more than blood if you eat too much salt. Once you eat too much salty foods you can make your sense of taste to be adapted to eating too salty food (KII 3 Iseyin Oyo State).

What people and also health workers usually say is that excess salt in the body makes the hands and feet sweaty and it causes hypertension (KII 15 Lalupon Oyo State).

The major disease is that if one eats too much salt, there will be too much water in the blood, eyes will be watery too. Too much salt also inhibits the proper functioning of drugs in the body (KII 13 Iseyin Oyo State).

I do not know what the health problems are, but I have heard many times that excess salt intake is not good for the body (KII 2 Ido Ibadan Oyo State).

Knowledge of how excessive use of cooking salt in food preparation can be controlled

The food vendors revealed what they know about how excessive use of cooking salt in food preparation can be controlled. Many of the interviewees stated that excessive use of cooking salt in food preparation can be controlled by measuring the quantity of salt that is to be used for cooking. They noted the need to always have a specific gauge for measuring salt into the food while cooking. Some interviewees mentioned 'gradual adding of salt to taste', while some other interviewees recognized frequent 'tasting of food when being cooked' as means that can be employed to control the excessive use of cooking salt in food preparation. There were three interviewees that opined that public sensitization on dangers inherent in excessive salt intake is vital for the control of excessive use of cooking salt in food preparation.

Ensuring the usage of salt measuring spoon (KII 4 Ado-Odo Ota Ogun State).

When cooking you must be adding the salt little by little. First of all, divide the whole salt you intend to use into two, add the first part to the food, stir and taste. If not yet okay, divide the remaining half into half again and add to the food (KII 3 Iseyin, Oyo State).

The masses should be well informed through public enlightenment so that everybody can know the side effect (KII 8 Iseyin Oyo State).

Practices usually employed to ensure that school meals contain just moderate salt

The majority of the food vendors interviewed in both Oyo and Ogun States clearly disclosed that they usually ensure that the meals they cook for the pupils contain moderate salt by tasting the food periodically when being cooked and by ensuring gradual addition of salt to taste. A number of the food vendors added that in order to ensure that the school meals they prepare contain moderate salt they usually make use of a measuring spoon to quantify the amount of salt. There were instances where few interviewees argued that they usually rely on their cooking experiences to ensure that they use moderate amount of salt in the school meals they prepare. One particular interviewee emphasized that she relies on her instinct in ensuring that sufficient amount of salt is being used in the school meals they prepare. Similarly, there was another interviewee who claimed that she relies on the aroma of food to ensure that accurate amount of salt is used in the school meals she prepares.

When I am cooking food like rice, I use to taste the food to know may be the salt content is okay and salt can cause sickness (KII 6 Odeda Ogun State).

Once we finish cooking it, we taste it, if it is not enough, we add to it (KII 8 Odeda Ogun State).

I use the spoon for measurement and also continue to taste the food to make sure the salt is okay (KII 12 Ado-Odo Ota Ogun State).

One has to do it gradually. If you put little salt once and you notice it is not sweet, you can add a little more (KII 5 Oke-Ado Ibadan Oyo State).

I rely on my instincts, if I am not careful and salt is too much in my food, we would not be able to eat it, I use to ensure salt is sufficient and not more (KII 15 Lalupon Ibadan Oyo State).

It is my nose, through smelling the aroma of the food, that I use to know the accuracy of the salt. I do not taste it. ...Yes, it is a practice I grew up into, my kids cannot cook soup and taste it, they will not dare it. If I grab a spoon, I will hit it against their head (KII 9 Kudeti Oyo State).

Sources of information available on the use of cooking salt in food preparation

The interviewees spoke about the sources of information available to them on the use of cooking salt in food preparation. The most frequently mentioned source of information was the pre-employment orientation seminar/ training programme that they took part in prior to being involved in the NHGSFP as food vendors. A number of participants clearly emphasized that they were informed during their orientation programmes to use moderate amount of cooking salt and use certain brand of salt (name of brand withheld so as not to amount to advertisement). Mass media platforms especially radio and television programmes and adverts were also identified as sources of information on the use of cooking salt in food preparation by many of the food vendors in the two states. One of the interviewees emphasized that she learnt that salt fortified with iodine helps the brain of children and is the appropriate salt that should be used for preparing meals for school pupils. A few interviewees acknowledged that they learnt about issues relating to the use of cooking salt from other people around them especially educated people they relate with. Similarly, a number of the food vendors mentioned parents and catering services as their sources of information on the use of cooking salt. There were few instances where some food vendors mentioned that they had previously received information about the use of cooking salt in food preparation from friends, acquaintances and neighbours.

Two food vendors particularly mentioned that they learnt from the hospital about the dangers involved in the excessive use of salt. A certain interviewee narrated her ordeals about how she learnt about dangers of excessive use of cooking salt when she was hospitalized during the peak of COVID-19 pandemic following her indulgence in the widespread myth of drinking and bathing with salt water to prevent COVID-19. Another interviewee also recounted how she learnt about the dangers of excessive use of cooking salt during her antenatal clinic visit and when her child was admitted in the hospital and was given advice to reduce the level of salt being given to the child for the sake of her child's health (heart and kidney related conditions).

During the training, I was told about the use of cooking salt (KII 4 Ado-Odo Ota Ogun State).

They told us that salt should not be too much in food, that when we finish cooking, that maybe salt is not enough, that is not good to put salt in food after cooking it (KII 13 Odeda Ogun State).

What happened is that when we applied for this job, we were trained that this is how we are going to prepare the food and this is how the salt will be, at times we do listen to lecture on television and radio about salt. Salt is not good for our body (KII 5 Sagamu Ogun State).

*…I do not really know what it (excess salt intake) causes but I heard it causes cancer but I do not really understand but I heard it from the radio (*KII 12 Ado-Odo Ota Ogun State).

I learnt about it on my own and also from friends, radio, and television (KII 2 Ido Ibadan Oyo State).

They made us understand that excessive intake of salt is bad, even we use to hear it from people, radio, television and friends (KII 2 Ido Ibadan Oyo State).

I lived with my parents while growing up and they are elderly; usually say that too much salt is not good. My dad uses a spoon to measure the salt (KII 2 Sagamu Ogun State).

The catering knowledge that I have is the source of my information about my method of cooking and the experience I have gathered so far make me an expert in this job without any problem (KII 6 Mokola Ibadan Oyo State).

Previous training on use of cooking salt and other food seasoning for cooking food for school meal

Several participants in the two states acknowledged that through their pre-employment orientation seminars they had the privilege of being exposed to training on the use of cooking salts and other food seasonings. Participants listed the things they were taught about the use of cooking salt and other food seasonings during the NHGSFP pre-employment orientation programme including the need to ensure moderate use of coking salt and other condiments in food, dangers of using excess cooking salt, the need to always use the spoon for measuring the quantity of cooking salt. Other issues mentioned as things taught about the use of cooking salt and other food seasonings include the use of sachet salt instead of unpackaged salt as well as replacing the use of other seasonings like bouillon cubes with the use of locust beans and onions.

We have been trained before on how to use cooking salt (KII 6 Odeda Ogun State).

What they taught us were numerous not only on food…. On salt, there must be enough salt and must not be too salty that is what we were taught, that we must put small baby spoon in the salt for gauge, we would not just be putting it with our hands (KII 1 Abeokuta North Ogun State).

We have been trained that the salt should not be too much in food, for that, we should use much onion than bouillon cubes (KII 6 Odeda Ogun State).

What I was taught on salt usage is to be using salt in little quantity at first then taste as you continue to add salt (KII 3 Iseyin Oyo State).

We were not taught specifically about the use of cooking salt but we were told to always use sachet and branded salt and not salt sold with "congos" or milk tins which are being sold in the market. We were told to use salt minimally. We were also told not to use bouillon cubes but use locust beans to taste (KII 10 Kudeti Oyo State).

Notably, more than one-third of the participants in each of the two states affirmed that they were not specifically taught about the use of cooking salt as it was only tangentially mentioned during their pre-employment orientation seminars. In addition, there were a number of interviewees in both Oyo and Ogun States that categorically affirmed that they had never received any form of training and had never been taught by anyone about issues relating to the use of cooking salts and other condiments. Few interviewees also disclosed that at some points they had to educate themselves on the issue of the use of cooking salts and other condiments during their meetings and interactions with other food vendors.

…when we went for the training, they did not deliberately talk to us about salt per se, they just mentioned it, lightly, like we should be adding salt to food but it should not be too much. Those things they mentioned is like palm oil (KII 20 Abeokuta North Ogun State).

I have not received any training. I only learned from a wife in my compound (KII 2 Sagamu Ogun State).

I did not receive any training on the use of salt at the start of the programme; I rely only on my catering experience. Although, when our coordinators get any report that some food vendors are not doing well on their job, they bring the matter up in our meetings and then advise us all on things to do to avoid errors and be better on our job (KII 15 Lalupon Ibadan Oyo State)

I did not receive any training except that people called me to cook for their parties (KII 7 Molete Ibadan Oyo State).

We were not taught anything (shakes head) (KII 8 Odeda Ogun State).

Nothing as regards salt was discussed with us. We were not taught about the use of salt but we were told the foods should be prepared using the normal cooking method (KII 17 Ado-Odo Ota Ogun State).

They did not teach us anything; they taught us nothing of such at all (KII 17 Iseyin Oyo State).

I was not taught about using salt or food seasonings (KII 15 Lalupon Ibadan Oyo State).

Food vendors' disposition to being trained on the use of cooking salt in food preparation

The key informant interviewees were asked to provide their viewpoints about the idea and plan of implementing an intensive training on the safe use of cooking salt for food vendors in their states. The interviewees commonly acknowledged the plan as a good and welcome initiative. All the food vendors cheerfully affirmed their willingness and readiness to be involved in the training. Several interviewees categorically mentioned that training them on the use of cooking salt in food preparation will help them to acquire more knowledge and skills that will not only be useful for the NHGSF programme but also aid the growth of their catering and cooking businesses. A number of the interviewees mentioned that the planned training on the use of cooking salt in food preparation is appropriate and will be useful because some of their colleagues who work as food vendors do not know how to use salt appropriately.

It is a good thing because they will enlighten us on various approaches for adding salt to meals (KII 12 Ado-Odo Ota Ogun State).

We will be glad to receive more training on salt use in food preparation because we want to have more knowledge on salt use (KII 9 Ipokia, Ogun State).

It will serve as an additional privilege for me and I see it as an opportunity for me to learn (KII 11 Ipokia Ogun State).

I will be more than happy. I will even be able to have more knowledge. It is good for me because I want to have more knowledge (KII 18 Odeda, Ogun State).

Our disposition is that we continually learn new things, and we will receive them with joy (KII 13 Odeda, Ogun State).

I will be very happy if we can be gathered together and given sound training on how to make use of cooking salt in food preparation (KII 6 Mokola Ibadan, Oyo State)

We are eager to attend the training. No one is an island of knowledge. There are many things that would be said that we would not have heard before. It would be beneficial to us in dealing with foods (KII 2 Ido Ibadan, Oyo State).

I will be very happy because I want to become an international food seller. We learn every day. So, if I have that experience, I will follow to become a part of them (KII 14 Lagelu Ibadan, Oyo State).

I will be happy about it. Some people don't know how to use salt appropriately, it will help us (KII 14 Lagelu Ibadan Oyo State).

I will be willing to learn and participate because the knowledge will not only be useful with this NHGSF programme but help me to get better at my business and aid growth in my food catering career since I aim to expand my food business (KII 10 Kudeti Ibadan Oyo State)

I will welcome the training and participate in it (KII 8 Iseyin Oyo State).

DISCUSSION

Several food vendors were knowledgeable about the health problems that can be associated with excessive intake of cooking salt. This finding about several food vendors having good knowledge of the health consequences of excessive salt intake corroborates several other studies which found a good level of knowledge of health consequences of excessive salt intake in their study populations (Addo *et al*., 2006; Azubuike *et al*. 2014; Baharudin *et al*., 2021). The various health problems of excessive salt intake such as hyperhidrosis, hypertension, diabetes, kidney problems, heart diseases identified by the study participants are in tandem with evidence on impacts of excessive salt intake noted in several studies (Rust and Ekmekcioglu, 2016; WHO, 2020; Hunter *et al*., 2022).

Notably, the finding also revealed that inadequate knowledge of health problems of excessive use of cooking salts and other condiments still existed among some food vendors. Similar pattern of result was noted in a study conducted by Baharudin *et al*. (2021). Just like Baharudin *et al*. (2021) noted, it is might be that some of these food vendors do not have basic exposure to information on health problems that could be associated excessive salt intake. However, the finding of this study underscores the need to promote nutrition education on the adverse effect of use of excessive salt intake in preparing school meals through appropriate capacity building interventions for food vendors.

In this study, a few means of controlling excessive use of cooking salt in food preparation were enumerated by the participants. These include majorly the 'use of specific gauge for measuring salt' and 'gradual adding of salt to taste'. Besides the few afore-mentioned means of controlling excessive use of cooking salt, the study observed that participants did not know about some other effective salt reduction strategies or means such as use of salt substitutes, use of natural flavour enhancers and choosing products with lower sodium content. Use of these salt substitutes has been commonly recommended as one of the viable salt reduction strategies (Dougkas *et al*., 2019; Zhou *et al*., 2013). In fact, several previous studies reported the potentials and values of low-sodium blends such as potassium chloride (KCl), calcium chloride (CaCl2) or magnesium dichloride (MgCl2) for the controlling of cardiovascular diseases especially hypertension (Armenteros *et al*., 2012; Campagnol *et al*., 2012; Zhou *et al*., 2013; Farrand *et al*, 2019; Greer, *et al*. 2020) as well as that of natural flavour enhancers in form of spices and herbs such as ginger, garlic, curcumin and capsaicin (Campagnol *et al*., 2012; Bhattacharya *et al*., 2017; Jafarnejad *et al*., 2020). However, the use of natural flavours may substantially alter the taste and aroma of food and may not be appreciated by everyone (Ponzo *et al*., 2021). Additionally, it has also been noted that the use of high amounts of some natural species and herbs might lead to toxicity (Bo *et al*., 2020). Hence, training programmes for food vendors on the safe use of cooking salt should emphasize the use of various effective salt reduction and control methods. Such training has the potential to equip food vendors with more functional knowledge and skills relating to the safe use of cooking salt. One of the recommended strategies and practical actions to reduce salt intake by the World Health Organization includes integrating salt reduction into the training of food handlers (WHO, 2020). Additionally, food vendors should be taught about weighing salt in accordance with the amount recommended in standard recipes as part of the effective practical actions that can be used to ensure that excessive use of cooking salt in food preparation is controlled.

It was noted that many food vendors do not practice weighing the salt being used in cooking their school meals. Furthermore, some food vendors rely solely on the use of personal discretions and previous cooking experiences in preparing school meals without having any standardized measurement. The findings of the study suggest the need for food vendors to be taught about weighing salt in accordance with the amount recommended in standard recipes as part of the effective practical actions that can be used to ensure that excessive use of cooking salt in food preparation is controlled. Training could be used to modify the practice of using of the aroma of food to determine the accuracy of salt in school meals.

The findings revealed that the pre-employment orientation seminar/training programme constituted a major source of information on the use of cooking salt in food preparation. Some food vendors revealed that they were taught a number of things relating to the use of cooking salt such as moderate use of salt, avoidance of unpackaged salt and the practice of gradual adding salt to taste. This finding implies that some food vendors have somewhat knowledge of issues relating to the use of cooking salt in food preparation that can be consolidated

through further intensive well-designed training programmes. It was, however, surprising that some food vendors revealed that they were not taught anything relating to the use of cooking salt in food preparation during the pre-employment orientation seminar/training programme. A previous study conducted by Thomas and Nwokocha (2021) among the food vendors engaged in NHSFP in Osun State revealed that about 30 per cent of the food vendors never attended any pre-employment training programme. This finding supports the need to implement a standard capacity building programme for food vendors on the use of cooking salt in food preparation across all the states in the country. Concerted efforts need to be put in place to explore feasible private-public partnership models and strategies that can help to develop a sustainable training programme on the safe use of cooking salt for food vendors involved in NHGSFP in Nigeria.

Conclusion

Many food vendors knew that excessive intake of cooking salt can result in several health problems such as hypertension, diabetes, kidney problems, heart diseases and hyperhidrosis. 'Gradual adding of salt' and the use of a spoon for measuring salt were the obvious means known by the food vendors as ways excessive use of cooking salt can be controlled in food preparation. The food vendors were not knowledgeable about some effective salt reduction strategies or means such as the use of salt substitutes, use of natural flavour enhancers and choosing products with lower sodium content. Food vendors rely on 'gradual adding of salt to taste', use of personal discretions and use of aroma to determine the accuracy of salt in school meals, a situation which can adversely lead to excessive use of salt in school meals and adversely affect the health of pupils whom they serve. Pre-employment orientation seminars and mass media were identified as the major sources of information about the use of cooking salt. However, some food vendors revealed that they did not receive any training on the use of cooking salt prior to being involved in their NHGSFP work. The food vendors were willing and favourably disposed to attending training on the safe use of cooking salt. The food vendors acknowledged that the training will be beneficial to them and improve their cooking skills and businesses.

CONFLICT OF INTERESTS

The authors have not declared any conflicts of interest.

ACKNOWLEDGMENTS

We sincerely acknowledge the funding support received from LINKS (a collaborative effort of the World Health Organization, the U.S. Centers for Disease Control and Prevention (CDC) through CDC Foundation and Resolve for Save Lives) for the research. We are also grateful to the NGHSFP offices in Oyo and Ogun States as well as key stakeholders such as headteachers and LGA desk officers who contributed greatly to the success of this study. In addition, we thank immensely all the food vendors and research assistants involved in the study.

REFERENCES

Action Health Incorporated (2020). Ogun State home grown school feeding programme: Monitoring and evaluation plan.

Addo, J., Amoah, A. G., & Koram, K. A. (2006). The changing patterns of hypertension in Ghana: a study of four rural communities in the Ga District. *Ethnicity & disease*, *16*(4), 894-899.

African Union (2019). CESA home-grown school feeding cluster: Terms of reference, strategy, work plan and indicators. Addis Ababa, Ethiopia: African Union.

African Union (2021). African Union biennial report on home-grown school feeding (2019-2020). Addis Ababa, African Union.

Agboola, S. A. (1979). *An agricultural atlas of Nigeria*. Oxford University Press, Nigeria. P. 248.

Armat, M. R., Assarroudi, A., Rad, M., Sharifi, H., & Heydari, A. (2018). Inductive and deductive: Ambiguous labels in qualitative content analysis. *The Qualitative Report*, *23*(1), 219-221.

Armenteros, M., Aristoy, M. C., Barat, J. M., & Toldrá, F. (2012). Biochemical and sensory changes in dry-cured ham salted with partial replacements of NaCl by other chloride salts. *Meat Science*, 90(2), 361-367.

Azubuike, S. O., & Kurmi, R. (2014). Awareness, practices, and prevalence of hypertension among rural Nigerian women. *Archives of Medicine and Health Sciences*, *2*(1), 23-28.

Baharudin, A., Ambak, R., Othman, F., Michael, V., Cheong, S. M., Abdul Aziz, N. S., Ganapathy, S. S., Palaniveloo, L., & He, F. J. (2021). Knowledge, attitude and behaviour on salt intake and its association with hypertension in the Malaysian population: findings from MyCoSS (Malaysian Community Salt Survey). *Journal of Health, Population and Nutrition*, *40, Article number 6*.

Bo, S., Fadda, M., Fedele, D., Pellegrini, M., Ghigo, E., & Pellegrini, N. (2020). A critical review on the role of food and nutrition in the energy balance. *Nutrients*, *12*(4), 1161.

Bosah, I. P., Bosah, C. N., & Obumneke-Okeke, I. M. (2019). Impact of national home school feeding programme on enrolment and academic performance of primary school pupils. *Journal of Emerging Trends in Educational Research and Policy Studies*, 10(3), 152-158.

Campagnol, P. C. B., Santos, B. A., Terra, N. N., & Pollonio, M. A. R. (2012). Lysine, disodium guanylate and disodium inosinate as flavour enhancers in low-sodium fermented sausages. *Meat Science*, 91(3), 334-338.

Civil Society Action Coalition on Education for All (2018). National/Oyo State Government home grown school feeding programme in public primary schools: The final monitoring report. Ibadan: NHGSFP.

Dani, B. O., & Ajayi, O. (2018). Assessing the association between salt intake, weight status and blood pressure among

school children, South-west, Nigeria. *Nutritional Journal of Nutritional Sciences*, 39(1), 7-20.

Farrand, C., MacGregor, G., Campbell, N. R., & Webster, J. (2019). Potential use of salt substitutes to reduce blood pressure. *The Journal of Clinical Hypertension*, *21*(3), 350-354.

Food and Agricultural Organization and United Arab Emirates University (2019). Stepping up school-based food and nutrition education: Exploring challenges, finding solutions and building partnerships. Rome. 128 pp. Retrieved from http://www.fao.org/3/CA3063EN/CA3063EN.pdf.

Gambo, O. O., & Adelokun, A. S. (2020). Time, cost and construction of public primary school classrooms in Southwestern, Nigeria (2020 - 2024). *International Journal of Educational Research*, 8(1), 162-177.

Greer, R. C., Marklund, M., Anderson, C. A. M., Cobb, L. K., Dalcin, A. T., Henry, M., & Appel, L. J. (2020). Potassium-Enriched Salt Substitutes as a Means to Lower Blood Pressure. *Hypertension*, *75*(2), 266-274.

Hunter, R. W., Dhaun, N., & Bailey, M. A. (2022). The impact of excessive salt intake on human health. *Nature Reviews Nephrology*, *18*(5), 321-335.

Jafarnejad, S., Mirzaei, H., Clark, C. C., Taghizadeh, M., & Ebrahimzadeh, A. (2020). The hypotensive effect of salt substitutes in stage 2 hypertension: a systematic review and meta-analysis. *BMC Cardiovascular Disorders*, *20,* Article number, 98.

Jokogbola, T. A., Adeyanju, A. N., & Abiodun, W. S. (2020). Home-grown school feeding system as a safety net for sustainable educational development in Nigeria: Historical perspective. *African Journal of Educational Management*, *21*(2), 213-224.

National Bureau of Statistics, Nigeria (2017). Demographic Statistics Bulletin. Retrieved 2nd February 2022 from https://open.africa/dataset/demographic-statistics-bulletin-nigeria-2017

National Population Commission (NPC) [Nigeria] and ICT (2019). Nigeria Demographic and Health Survey, 2018. Key Indicators Report. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF.

National Social Investment Office (2016). National home grown school feeding programme: The journey so far. National Social Investment Office, Abuja, Nigeria.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*, 1-13.

Odili, A. N., Chori, B. S., Danladi, P. C., Nwakile, P. C., Ogedengbe, J. O., Nwegbu, M. M. A., & Isiguzo, G. C. (2020). Salt intake in Nigeria: a nationwide population survey. *European Health Journal*, 22(12), 2266-2275.

Oyefade, S. A. (2014). Administration of home-grown school feeding & health programme in Osun state. Unpublished MPA Long essay, Department of Public Administration, Faculty of Administration, Obafemi Awolowo University, Ile-Ife.

Ponzo, V., Pellegrini, M., Costelli, P., Vázquez-Araújo, L., Gayoso, L., D'Eusebio, C., & Ghigo, E., & Bo, S. (2021). Strategies for reducing salt and sugar intakes in individuals at increased cardiometabolic risk. *Nutrients*, *13*(1), Article number 279.

Rust, P., Ekmekcioglu, C. (2016). Impact of salt intake on the pathogenesis and treatment of hypertension. In: Islam, M. S. (eds). *Hypertension: from basic research to clinical practice. Advances in Experimental Medicine and Biology*, vol 956, pp. 61-84. Springer, Cham.

Thomas, K. A., & Nwokocha, J. C. (2021). Food vendors and school management compliance to home grown school feeding programme implementation module in Osun State, Nigeria. Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria.

World Food Programme (2018). Home grown school feeding. Resource Framework Technical Document, Rome. Retrieved 22nd March 2021 from https://docs.wfp.org/api/documents/WFP-0000074274/download/.

World Food Programme (2019). The impact of school feeding programmes. Retrieved 22nd September 2020 from https://www.wfp.org/publications/impact-school-feeding-programmes.

World Health Organization – WHO. (2020). Salt reduction. Retrieved from https://www.who.int/news-room/fact-sheets/detail/salt-reduction.

Zhou, B., Wang, H. L., Wang, W. L., Wu, X. M., Fu, L. Y., & Shi, J. P. (2013). Long-term effects of salt substitution on blood pressure in a rural north Chinese population. *Journal of Human Hypertension*, *27*(7), 427-433.