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Citation:

Orighoye, O and Apekey, TA and Maynard, MJ (2023) Informing Diet and Physical Activity Interventions with Family Involvement in an Urban Setting: Views of Children and Adults in Lagos, Nigeria. Sustainability, 15 (10). pp. 1-16. ISSN 2071-1050 DOI: <https://doi.org/10.3390/su15107850>

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Document Version:

Article (Published Version)

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## Article

# Informing Diet and Physical Activity Interventions with Family Involvement in an Urban Setting: Views of Children and Adults in Lagos, Nigeria

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**Abstract:** There is limited evidence on diet and physical activity (PA) interventions to prevent childhood over- and under-nutrition in Nigeria, particularly those with parental involvement. The aim of this qualitative cross-sectional study was to explore parents', children's, and other stakeholders' views on what might enable or hinder participation in diet and PA interventions with parental involvement, and potential intervention components likely to be feasible and acceptable. The study took place in Lagos State, Nigeria. Sixteen boys and girls aged 8–11 years in four participating schools were involved in the study. In addition, women ( $n = 19$ ) and men ( $n = 13$ ) aged 18–60 years took part. These included parents, teachers, school heads, community leaders, health professionals, and health or education civil servants, recruited via the participating schools, community and professional links. Data were collected in schools, homes, and places of work via one-to-one interviews and focus groups, audio-recorded with participants' consent. Topics included knowledge about a balanced diet and active living; frequency of exercise and barriers and facilitators of participation; and ideas for fostering good diet and physical activity habits. Socio-demographic data were collected orally at the start of each discussion. Thematic analysis of verbatim transcripts of the recordings was conducted. Three overarching themes were identified: (1) Active community collaboration; (2) strategies for involving families; and (3) schools as key settings for interventions. The main barriers to participation in potential interventions included poor access to clean water, safe outdoor play space, and menstrual hygiene products. Suggested solutions included increased security, infrastructure improvements using recycled materials, school gardening, and health campaigns funded by local dignitaries. Health literacy education for parents, tailored to local dialects, was considered an important potential intervention component that would engage families. The feasibility and acceptability of grassroots suggestions for intervention components and parental involvement could usefully be explored in future pilot studies.

**Keywords:** Nigeria; diet; physical activity; children; families; interventions

**Citation:** Orighoye, O.; Apekey, T.A.; Maynard, M.J. Informing Diet and Physical Activity Interventions with Family Involvement in an Urban Setting: Views of Children and Adults in Lagos, Nigeria. *Sustainability* **2023**, *15*, 7850. <https://doi.org/10.3390/su15107850>

Academic Editors: Graça S. Carvalho and Andreas Ihle

Received: 26 February 2023

Revised: 30 April 2023

Accepted: 9 May 2023

Published: 10 May 2023



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## 1. Introduction

With less than 10 years left to meet the 2030 Sustainable Development Goals, there is concern that, despite evidence to support a holistic agenda for interventions to improve the health of children and adolescents, levels of implementation remain poor [1]. There is limited nationally representative community-based intelligence on the nutritional status of school-aged children and adolescents in Nigeria. The Nigeria Demographic and Health Survey (NDHS) and the National Nutrition and Health Survey (NNHS) both include nationally representative data on nutritional status, but focus on children aged under 5 years and citizens aged 15 years and older [2,3]. The latest NDHS revealed high levels of stunted growth and micronutrient deficiencies among children [3]. Additionally, the NNHS revealed differences in nutrition indices between the northern and southern regions,

and that there are more nutrition interventions in the north compared to the south of the country [2]. Further, the prevalence of overweight and obesity among children and adolescents is on the rise and is significantly greater in urban vs. rural areas in Nigeria [4,5]. More research with which to inform policy is needed to explore approaches to improve diet and activity among children in Nigeria. Thus, the current research sought to address the research gaps in Nigeria relating to geographical location (lack of focus of research in the south of the country) and malnutrition among school-aged children and adolescents aged over 5 years. Systematic reviews of existing evidence have demonstrated that school-based interventions have positive results on children and adolescents' anthropometry, dietary intake, and physical activity (PA) [6–8], and may also have positive effects on parents' health outcomes [9]. However, research on these topics conducted in sub-Saharan Africa is lacking.

Qualitative methods are valuable in enhancing health research and providing in-depth understanding of health, health behaviours, and contexts [10]. Such methods are also useful in prioritising intervention needs from peoples' own perspectives as a key stage in programme development [11]. Existing relevant qualitative research in urban and rural school and community settings in sub-Saharan African countries suggests key barriers and facilitators associated with optimal nutrition and PA from children's and adults' perspectives [12–15]. Barriers included limited access to resources and facilities [12,14], lack of concern about obesity [12,15], and gender-related issues such as the need for segregated physical activity, or the perception that girls should focus on education or the home [12]. Facilitators included positive peer pressure [13–15] and public health messages provided in community settings [14]. None of these studies were conducted in Nigeria. To the authors' knowledge, the potential for family involvement in nutrition interventions for children has also not previously been explored in Nigeria.

Therefore, the aim of this research was to conduct a qualitative study exploring the views of parents, children, and other stakeholders on the factors that could inform diet and PA interventions among school-aged children, with parental involvement, in an urban setting in Lagos, Nigeria. Specific objectives were to:

1. Explore views on social, cultural, and environmental factors and their role as barriers and facilitators in achieving favourable diet and physical activity habits;
2. Understand views on the potential solutions to the barriers identified that, in turn, could help inform culturally acceptable intervention approaches to prevent the risk factors for childhood and adolescent malnutrition;
3. Examine views on acceptable methods for involving families in diet and physical activity interventions for children;
4. Explore ways in which parental involvement could be enhanced by active engagement of the school and the wider community in diet and physical activity interventions for children.

The findings are of value for informing future development and piloting of interventions for children in these settings.

## 2. Materials and Methods

The study is reported according to the consolidated criteria for reporting qualitative studies (COREQ) 32-item checklist [16] (Table S1). A socio-ecological model (SEM) [17] was the core theoretical perspective for this research. The SEM was the conceptual basis for an overarching settings approach [18] and a health-promoting school ethos [19], further informed by community-based participatory research (CBPR) [20]. Methods and concepts associated with constructivist grounded theory were also integrated into the qualitative research process. These included iterative recruitment, purposive sampling, concurrent data collection and analysis, theoretical sampling, and data saturation [21]. Ethical approval for the study was obtained from the Research Ethics Committee, School of Health, Leeds Beckett University (Ref: 52680). The study was also approved by the Lagos State Ministries of Education and Health (Ref: EDIII/SCH.ADM/C.U/Vol.18/174).

The location of the study was the Eti-Osa and Ibeju local government areas (LGAs) of Lagos State, Nigeria. These local government areas were chosen because of their socio-economic and cultural diversity [22]. Engagement with stakeholders, recruitment of participants, and data collection took place between November 2018 and April 2019.

### *2.1. The Study Population, Sampling, and Recruitment*

The target populations for this study were parents, school children, teachers and school heads, community leaders, health professionals, and civil servants in the health and education sectors residing in the Eti Osa and Ibeju LGAs of Lagos State. Other stakeholders, including representatives from the Nutrition Society of Nigeria, and The Youth and Sport Organisation, Lagos, were invited to participate in the study because they were knowledgeable about diet and exercise relating to children in both schools and communities. The participating schools were chosen by the Ministry of Public Service, Lagos State Universal Education Board and Ministry of Education as schools that were registered as government-approved for research activities. Purposive, non-probability sampling of child and adult participants was used. The characteristics on which sampling was based were as follows: (i) Children aged 8–11 years, resident within the community where the research was conducted, and able to participate in discussions relating to their food and PA; (ii) Adults aged 18–60 years who were parents of school-aged children; (iii) Other adults with knowledge of nutrition and PA among school children (e.g., schoolteachers); and (iv) Diverse socio-economic status groups. Socio-economic status was derived from participating adults' occupation and income classifications based on the Nigerian All Media and Product Survey [23]. The four main groups, AB, C, D, and E, define the highest to lowest social class groups. By these classifications, group AB is the 'upper class' (with subcategories A1 = upper-upper, A2 = upper-middle, and B1 and B2 = lower-upper classes). Group C is the 'middle class' (C1 = upper-middle and C2 = lower-middle classes). Group D is the 'lower class' and Group E is deemed 'poor' (unemployed and/or living below the poverty line (equivalent to a monthly income of USD 38–64).

Four schools were identified as eligible to participate. Although selected by the ministries, the four schools coincided with those that the lead author (O.O.) had also identified to ensure diversity based on the school population, and the type of school (primary and secondary), and that they were also logistically feasible to include (e.g., based on geographical location). District Officers in the ministries were assigned to the project and sent invitations and participant information sheets to the schools via email and in hardcopy. The information was then passed on to children within the four schools and their parents. After Phase I of recruitment (and analysis, see below), theoretical sampling was conducted for two further phases of data collection. The same recruitment methods as in Phase I were used to engage additional children and parents, constituting Phase II. Further, a sample of other stakeholders (as noted above) was recruited for Phase II. This included civil servants in the education ministry who were involved in sports and nutrition, school heads, members of the local community, and people involved in relevant non-governmental organisations. These stakeholder groups were also sampled for a subsequent Phase III of interviews with adults only. Prospective participants for Phases II and III who were not children or parents were identified through the participating schools and the lead author's existing professional and community links, and contacted via email. In all phases of the data collection, interest in the study was registered using sign-up sheets, and those who volunteered to participate were provided with consent forms (adults and children) and assent forms (children).

### *2.2. Data Collection Tools and Methods*

Data were collected using semi-structured one-to-one interviews and focus groups. A single interview guide was developed based on the study objectives and the findings of previous qualitative research, reviewed above. Topics included knowledge about a balanced diet; types of food consumed and influences on consumption; views and knowledge about

exercise, and types of exercise participated in; frequency of exercise and barriers and facilitators of participation; and ideas for fostering good diet and PA habits. The interview guide was used to direct the discussion, but with a flexible approach maintained by the use of additional prompts and clarifications, re-ordering or skipping questions as appropriate based on participants' emerging accounts. To support reflexivity, a research diary was kept in which the lead author noted observations, interactions, conversations, and responses; additional insights from repeated listening to the audio recordings of the interviews and focus groups; and the potential influence of her thoughts and feelings on the research process. These reflections were also discussed with the co-authors (M.M. and T.A.), aiding evaluation of the research process.

### 2.3. Data Collection Procedures

Consent to participate was obtained prior to data collection. Due to the potential for low literacy, ethical approval was in place to obtain verbal consent if this was preferred by participants. However, with additional explanation of the project, all participants were able to provide written and verbal informed consent/assent. All participants were reminded that they could stop taking part in the session at any point. Socio-demographic data were collected verbally at the start of each interview or focus group discussion. Focus groups with school children were carried out in quiet classrooms identified by the school staff, separate from the main classrooms. One-to-one interviews with participants were held in either open-plan government offices (for adult participants who were not parents or teachers), own homes for interviews with parents and their children, and in open seating areas in schools for interviews with teachers. Due to the security issues that are common in Nigeria, and the precautionary steps schools take in safeguarding children, a security guard in each school remained nearby to the classroom while the focus groups and interviews took place. In the government offices, it is usual for security guards to be assigned to government officials, so interviews were carried out with a security guard present; however, they did not interact with the study activities. During the interviews and focus groups, other school children, teachers, and government staff members were not allowed to walk around the area where the discussion was taking place until it had ended.

All of the interviews and focus groups were conducted by the lead author (O.O.), a Nigerian woman, paediatrician, and a doctoral student at the time of the study [24]. Discussions were principally carried out in English but also naturally lapsed into local dialects, pidgin English, and Yoruba, in which O.O. is also fluent. Some respondents were previously known to O.O. through the awareness raising of the project and other community work. However, research goals were only discussed within the context of the information sheet and to address any questions about the project. There was no obligation to take part in the study, with the onus on potential respondents to volunteer their interest. In the schools, the mood of the research sessions was friendly, engaging, and light with laughter. Teachers established a positive attitude towards the sessions with songs, announcements at the assembly, a brief description about the nature of the research, and by introducing the researcher. The discussions which took place in the community were equally friendly in tone, with parents keen to allow the researcher to talk with their children as the study was of interest, and were inclined to prompt further discussion after the interviews had been completed. Good engagement, a positive mood, appearing comfortable, and laughter were also evident in the interviews with adult participants. For children interviewed in the community, a parent sat outside or stayed nearby as the interviews were carried out, but did not appear to influence the answers of the children. The interview concluded when all topics were covered, and/or no new information was proffered. Discussions were audio-recorded, with permission, using a voice recording application on an Android phone; sound files were immediately transferred to secure storage and deleted from the device.

Initial data (Phase I) were gathered from 18 participants (3 parents, 5 adults in the health and education sectors, 3 children who participated in semi-structured interviews, and 7 children who participated in a focus group discussion). The interviews lasted

45–60 min, and the focus group lasted 1 h 45 min. Phase II of data collection involved a total of 14 participants (3 parents, 5 stakeholders in the health and education sectors, and 6 children) in interviews also lasting 45–60 min. Phase III of data collection, to address questions that arose from Phase II, involved a further 16 participants (5 parents, 1 young adult, and 10 civil servants or personnel in the education and sports sectors). Two focus group discussions were conducted with six participants in each of the groups. Four participants were interviewed. The focus groups lasted 45–60 min and the interviews 30–45 min. The total achieved sample size was sufficient to provide diverse views on the phenomena of interest, evidenced through data saturation [25]. Data were stored securely on password-protected cloud storage (OneDrive; Google Drive) available at the lead university for all staff and students.

#### 2.4. Data Analysis

Transcripts of the interviews and focus groups, and memos (Phase II only), formed the analytical datasets. Recordings of the interviews and focus group discussions were manually transcribed, with words and sounds captured verbatim (i.e., exactly the way they were delivered). Attention was also paid to pauses, non-verbal utterances, and silence. Qualitative data analysis software was not used.

Coding and analysis were conducted by O.O. and discussed with the co-authors (M.M. and T.A.) For the data collected at Phase I, initial and focused coding and comparison of concepts and categories was based on the main research objectives. This analysis led to the creation of another set of refined, specific, and more probing questions for Phase II interviews to uncover deeper meaning in the research. For the data collected in Phases II and III, verbatim manual transcription was also carried out, as in the first stage of data collection. Analysis for these two phases included initial and focused coding, and comparisons of concepts and categories. Applying new or better understanding of a phenomenon, constructing categories and identifying links between them for conceptual clarity was deemed sufficient as emergent grounded theory [26]. Interview and focus group transcripts and drafts of interpretative data and reports were shared with participants with the aim of respondent validation, though the value of this with regard to research rigour is contested [10]. Direct quotes which support the data were extracted and support the presentation of themes in the results section. Quotes are labelled with a unique reference number, male or female gender (M or F), occupation and socio-economic classification for adults (AB-E). 'Child' and age in years was also included within the label for quotes from child participants. Quotes from focus group discussions are also denoted by the code FGD. For example, FGD 034, M, Civil Servant, D indicates the occupation of a man of 'lower' social class who took part in a focus group discussion; 024, M, Child 10yrs indicates a boy aged 10 years who was interviewed.

### 3. Results

#### 3.1. Participant Characteristics

A total of 48 individuals (32 adults; 16 children) took part in the study across the 3 phases of data collection (Table 1).

**Table 1.** Participant characteristics.

Participant Characteristics		
	Adults	Children
Total sample size, <i>N</i>	32	16
Female, <i>n</i> (%)	19 (59)	8 (50)
Religious affiliation		
Christianity	28 (88)	10 (62)
Islam	4 (12)	6 (38)
Geographical region of origin, <i>n</i> (%)		
South (South West, South East, South South) <sup>1</sup>	31 (97)	11 (69)
Occupation		
Higher education student	1	-
Teacher	6	-
Business person	7	-
Health sector	4	-
School head	3	-
Voluntary sector	3	-
Civil servant	7	-
Social Economic Class		
AB (highest)	0	-
C	4	-
D	28	-
E (lowest)	0	-

<sup>1</sup> All other participants were from Northern regions (North Central, North East, North West).

### 3.2. Key Themes

Analysis of the three overarching themes (Table 2) is presented below, supported by direct quotes from the data. Further quotes supporting the themes are provided in Supplementary Table S2. As described in the methods, direct quotes are labelled with a unique reference number, gender, occupation, and socio-economic classification for adults, and age for child participants.

**Table 2.** Identified themes and subthemes.

Key Themes	Theme Description	Subthemes
1. Active communities	Opportunities highlighted for links to community-based initiatives prompted by members of the communities, including leaders. It points to the idea of partnership and shared responsibility for health promotion to reduce the burden on health services.	<ul style="list-style-type: none"> <li>• Taking ownership</li> <li>• Community agricultural interventions</li> <li>• Safe play environment</li> <li>• Language and religion</li> <li>• Health campaigns</li> </ul>
2. Strategies to involve families in diet and exercise interventions	A range of views on how people can be engaged to undertake health promotion, preventive measures, and action to promote healthy diet and PA in schools and communities. When responsibility is shared by communities and schools, approaches to these interventions are suggested that are more appropriate for the local context.	<ul style="list-style-type: none"> <li>• Teaching food and PA skills/food and health literacy</li> <li>• Using simple learning aids in the local context</li> <li>• School sports competitions/health campaigns</li> <li>• Professional support</li> </ul>
3. Schools as key settings for diet and exercise interventions	Schools were felt to have a universal reach, and that they are ideal settings to support children and young people's lifestyle choices.	<ul style="list-style-type: none"> <li>• Setting up school gardens/farms</li> <li>• Train teachers on food and PA skills</li> <li>• School feeding and sports programmes</li> </ul>

#### 3.2.1. Theme 1: Active Communities

It was felt that the long-term sustainability of interventions that aim to promote a healthy diet and exercise among children required everyone's collective participation and not only of the federal or local government, as expressed by some participants:

*“However, we know how the government works and the situations happen, and we abandon the initiatives we have for the nation. All we can also do is support whatever the government is doing because if we leave everything for them, Nigeria will not work well. We have to take ownership as parents, communities and health professionals, even the education people need to be involved.”* (022, M, Medical Doctor, D).

There was also a suggestion from the participants that notable individuals in the communities could take responsibility for schemes within schools, such as the school feeding programme and sports activities (blending both modern and local games, played indoors and outdoors) to promote healthy diet and PA among children. A number of participants mentioned that communities working with schools should take on appropriate responsibilities by getting involved in the school sports competitions, and in groups that push for community involvement in promoting sustainable agriculture. Additionally, some participants felt that community agricultural interventions can be an avenue to promote healthy diet and PA among children, with family involvement, by encouraging communities to create spaces for agricultural infrastructure such as farmland for schools:

*“When the international donors pull out with our hands tied to the back, we will rely on community and social mobilization to see that the intervention project continues flying. Now the function of these mobilization teams is to work with a school support community board to see that the project works. Now this school support community board is made up of members of the community where the school is located. Its board members are mostly notable people in the community who have the means to support projects like a food project.”* (FGD 034, M, Civil Servant, D).

It was commonly voiced that although notable individuals in communities can support school schemes, such as yearly interhouse sports competitions, there was a tendency for such individuals to not be supportive, either due to unwillingness or a lack of interest:

*“It is funny because we are told to ask the patrons of the houses to give us money, but then the patrons are not even willing to contribute. It is just one out of many that tends to give us money, that why each year the headmistress sorts of changes the patrons within the leaders or prominent people in the community, so that they can support the interhouse sports for their children.”* (048, F, Sports Official, D).

It was discussed among some participants, with similarities of views seen between professionals and parents, that community responsibility could be used to mitigate against barriers to interventions, such as lack of physical safety. A range of positions were taken: those conveying safety fears but also expressing potential solutions; participants making rhetorical complaints and not providing solutions vs. participants who saw the problems and provided specific solutions; and those presenting self/organisations as part of the solution vs. suggesting hypothetical roles for others. It was suggested by some participants that communities working with schools can create safe play spaces for both parents and children. It was believed that safe play areas would encourage more physical activities, organised both in schools and within the communities:

*“The fear of kidnapping is an issue in the community. You cannot even say you are safe let alone leave your child to go and play somewhere. No o. So I still think the school area is a safe place to start at least there are people always looking around and watching the children. Let them play there. But come to think of it, if communities work together and create a safe place for children and even adults to do different sport activities even if it is a place to play Ayo [a traditional African game played on a carved wooden board] or other African games and add the modern games it will go a long way. Highest they pay for security. I bet it will work, no one will want to harm people just having fun.”* (029, F, Community Development Worker, D).

Access to clean water was a part of the discourse around safety. In relation to menstrual hygiene, clean water access also intersected with gender to impact on the engagement of children in PA. It was expressed among the girls that their periods were a hindrance



to engaging in PA as they did not have the resources for adequate menstrual hygiene management. Participants also suggested that a safe play environment, and diversifying activities, would encourage young girls to participate in PA:

*“I do skipping rope with my friends, sha, and it is nice. Sometimes we run but I don’t think there is much exercise or sports that girls can do here especially in school. So, we just do skipping rope, running and maybe play ten ten [a traditional Nigerian clapping game]. That is it, it can be boring sometimes, so we just sit down as girls to talk about different things” (FGD 015, F, Child 8yrs).*

Within discussions on how communities can support schools, a subtheme on creative solutions to the security issue emerged. It was expressed that recycled or locally sourced materials could be used to create safe playgrounds for school children in both communities and schools. This was within the context that communities and schools should provide opportunities for green spaces which can encourage the active engagement of children and parents in PA:

*“As for me, I think we can design a playground from the scratch. You don’t need a lot of expensive equipment and being an environmentally friendly person, we can use recycled materials and create a safe playground for children in school and even extend to the communities.” (029, F, Community Development Worker, D).*

With suggestions for community responsibilities, another subtheme was identified. Discussions about language and religion were common among participants, as it was suggested that local dialects and indigenous languages such as Pidgin English should be used in health education. Use of these dialects and languages could serve as a means of increasing reach to parents and children with regard to nutrition- and PA-related health promotion. The English language was sometimes perceived as being a barrier to learning, especially concerning health:

*“All these doctors and health people speaking grammar that is too big, please tell them to teach parents in simple Oyinbo language. Use Ibo or Hausa or even Pidgin if the case is critical. Simple English about food and exercise for their children is what they need. Do town hall meetings in the communities. Take the gospel to them. You know all these parents do not like attending PTA meetings, so carry the message to them in their area.” (029, F, Community Development Worker, D).*

The role of language and religious settings were often interlinked. Religious gatherings in churches, mosques, and town halls in various communities were proposed as an effective way to promote healthy diet and PA through health literacy, and would be successful when conducted in local dialects. It was commonly felt that parents coming together during an activity such as a religious gathering could benefit from health literacy events and outreaches organised in their communities. This would provide opportunities to learn about healthy diet and exercise, and help in understanding the health needs of their children:

*“Parents need to be taught about nutrition in a language they understand, if you have to teach them in Yoruba and it is going to help then we have to do it. We also need to make use of religious organisations, they are a part of the community and it will help in further education about food and even sports.” (021, F, School Head, D).*

However, disinterest in health promotion events among parents, even in religious settings, was also a part of the discourse. Among some participants, it was felt that parents showed less interest in health literacy, prioritised other interests such as attending social gatherings, or could not financially afford schemes that promote health education. Parents’ disinterest was also said to be linked to children’s disinterest in engaging in sports activities:

*“... Then it is not every time we can play football, as we think of books too because of our parents who say we play too much.” (024, M, Child 10yrs).*

Aligned with the potential for healthy diet and PA interventions to be delivered in religious and community settings, a subtheme on health campaigns was identified. Participants suggested that the influence of religious leaders and faith settings (as noted above) could be harnessed to support nutrition- and PA-related health promotion in the form of health campaigns in local communities. It was commonly felt that such health campaigns would impact positively on parents and children:

*“Dr, also when you want to talk about healthy food and exercise for children, do not forget to emphasize in a community gathering the need for religious leaders to encourage and support people, especially parents in the community to feed their children. Religious leaders also can provide the platform for campaigns on healthy eating and physical activity.”* (FGD 038, M, Civil Servant, D).

Although lack of funding from the government was indicated as a potential barrier to sustainable health campaigns, participants suggested that the public and private sector could work together to promote the campaigns in both communities and schools:

*“We need health campaigns. I know organisations do these, but it should not stop in just the communities, the school also need these kinds of campaigns. A lot of health issues are in schools today. We have food issues, water and so on. We need to work together and see that the school is a safe environment for the children. Nothing stops us from having a sports competition to raise awareness for hypertension or diabetes.”* (021, F, School Head, D).

### 3.2.2. Theme 2: Strategies to Involve Families in Diet and Exercise Interventions

Education for promoting healthy diet and PA among children and parents was suggested among participants. Potential ideas for education content included meal planning, exploring healthy foods from diverse countries and cultures, and learning culinary skills, with parents and children engaging in the activities. These ideas were discussed to address the knowledge gaps identified:

*“Teaching parents is like doing school for them because looking at nutrition and exercise, it is very necessary. It has to be simplified teaching nothing complex, the essential things, it just that you look at Nigeria and think are people ready to learn but public health education is very key to us. We have to use this means to teach the parents.”* (030, M, Development Manager, D).

It was commonly felt that inadequate finance, and parents' fast-paced work environments, led to unfavourable dietary and activity choices. These barriers often shifted the responsibility of providing healthy meals to children themselves, or to the schools they attend. It was not always possible to meet those responsibilities with healthy choices, as expressed by some participants:

*“At home, it is . . . if there is money, sometimes we do not eat before we go to school and sometimes maybe rice in the morning, and rice in the evening. For school, I buy food in school but the food is not all that good o, let me not lie but it is okay. Sometimes we buy rice, sometimes spaghetti, sometimes too maybe we buy yam and stew, but the water they use is not that good, the people selling sometimes use the toilet water and it is not good. If I am not all that hungry, I can buy egg roll, biscuits, meat pie, or sweets.”* (010, F, Child 11yrs).

Within discussions around teaching food and PA skills, a subtheme was identified on the potential of using simple learning tools tailored to the families. It was suggested among both parents and professionals that incorporating cultural activities, such as dance and folklore, visual aids, board games, and mobile applications could encourage parents to be involved in promoting a healthy diet and active living:

*“One thing I think is using visual aids, board games if possible. Or very simplified book in simple English or in languages that parents and teachers can understand. We can also*

*teach them using these aids and also talk about budget in relation to managing healthy lifestyles for both parents and children. It is like you have book that encourages you and then sessions to tell you how to proper manage your funds to make food available for your children.” (030, M, Development Manager, D).*

Participants suggested that improving the school curriculum to include health promotion would engage children and parents. Health professionals suggested there was a need for their support in achieving the goals for healthier diet and PA. However, parents also suggested peer support for better equipping themselves:

*“Schools need to improve their curriculum for nutrition and exercise that uses culture again to help the children know the importance of culture with food and exercise. We need teachers who understand these concepts. Imagine teaching Yoruba and you are sitting in the classroom with no activity for the children to engage in, it loses the whole meaning of whatever topic you are teaching the children. The schools need to research and find ways to imbibe culture and food and exercise because that is how the children will learn more.” (003, F, Caterer, D).*

### 3.2.3. Theme 3: Schools as Key Settings for Diet and Exercise Interventions

It was suggested by participants that introducing gardens/farms, in addition to improved sports areas and equipment in schools (*“When there is everything needed to participate in different sports apart from football.” (027, M, Child 10yrs)*), would benefit school children as it would enhance experiential learning about healthy eating and PA. However, school farming was not without its challenges:

*“I also tried having a farm in the school, but the challenge there was that the teachers and secondary students were causing a lot of damages in a way and it result in a less bountiful harvest. We tried it but it didn’t work well because of man-made activities it is something we might try again because I think it will be very beneficial and also it can encourage parents in the community to start a small farm. It will promote activity and help with food, especially vegetables.” (020, F, School Head, D).*

Individuals or organisations ‘adopting’ schools to promote school gardens and other initiatives to address insufficient funding from the government, and as a part of corporate social responsibility, was within the discourse. This theme linked to school settings and active communities working together to promote healthy nutrition and PA:

*“Like I know there is an organisation that currently adopted few schools in Lagos and they are developing school gardens and a school feeding programme, and I think this is working and should be adapted in various schools, we need people, organisations to do these things. I look forward to seeing an intervention that adopts a school in Lagos.” (019, F, Civil Servant, C1).*

Within the discussion of school gardens/farms and sports areas as potential components for healthy diet and PA interventions in schools, both parents and professionals suggested that there is a need to train teachers so that they develop the right skills, and provide them with the necessary tools to promote health in schools. Professionals felt that the challenges associated with the government teaching scheme, which has resulted in large numbers of low-paid temporary teaching staff, made it difficult to improve the quality of education:

*“... we need teachers that can work, not temporary teachers within the schools who cannot also afford to live. We also need teachers who will come regularly to teach without excuse.” (020, F, School Head, D).*

Adoption of schools, bringing the private and public sector together to achieve a common purpose, such as supporting school gardens, was also felt to be a potential solution to sustaining school food programmes. Although there is a current home-grown school feeding programme recently initiated by the Nigerian government, it has experienced both success and challenges as expressed by some participants:

*“So looking at the school’s scheme for our children, I will say the children are trying as well but the fact that we adopt the word balanced diet it is not easy to achieve this, it is not easy at all. And for us to know those that are eating the balanced diet, it is not easy, although our food sellers are really trying, because when they give the children food, they put some fruits with the food. And you know many of the children their parents cannot afford it, so the sellers put fruits together with the foods, and this kind of helps the children and makes it easier to say at least the children are eating something balanced.”* (009, F, Physical Education Teacher, D).

Improving the quality of food and food hygiene practices were part of the school food discourse. Child participants in particular expressed the need for higher standards in order for to them to have safer and healthier meals:

*“...for the school part, they should increase the food, and also they should not use dirty water to cook the food and maybe they should not sell for that is almost sour for us.”* (005, M, Child 10yrs).

*“As for food, maybe in school they should make the food more, and also make sure they use clean water to cook the food and they can add fruit like mango or orange for us.”* (010, F, Child 11yrs).

## 4. Discussion

### 4.1. Key Findings and Interpretation in the Wider Context

This qualitative study resulted in three overarching themes: 1. Active communities; 2. Strategies to involve families in diet and physical activity; and 3. Schools as key settings for interventions. The nascent theory that emerged from these findings is that:

1. Grassroots engagement is essential to promote a healthy diet and physical activity for children, and that this requires:
2. Synergy between communities and schools that involves parents, children, community members, teachers, and other key players to effectively carry out health promotion interventions for optimal health and wellbeing.

Potential components for a future intervention suggested by participants included education to develop healthy eating, PA, and water, sanitation, and hygiene (WASH) skills among parents and children; school gardening; school sports events; health literacy for parents in local dialects, using simple learning aids and involving religious leaders; and corporate responsibility schemes linked with school feeding and other programmes.

The study findings can be further interpreted in light of the wider research literature, policy, and the underpinning theory. Within the active communities theme, adult participants identified the need to tackle barriers to the development and uptake of diet and PA interventions, which stem from factors at the school environment and wider societal levels. These included inconsistent funding and a lack of safe outdoor space for PA. The solutions they suggested included active collaboration between communities and schools. This type of partnership is also a necessary feature of CBPR [20] and the health-promoting school ethos which informed the settings approach in the current study [19]. However, the discussions with adults also indicated that there were few existing relationships between schools and communities, and therefore they were not working well together. Participants in this study attested to only a few community members getting involved in the promotion of school initiatives, such as interhouse sports competition and improvements to school meals because of the general lack of ownership, financial issues, or disinterest.

Nigeria, similar to other countries, has a National School Health Policy (NSHP) [27] as the foundation of a health promoting, whole-school approach. According to a previous study in Nigeria involving interviews with head teachers and observations in schools [28], teachers attempted to deliver school health programmes (SHPs; core constituents of the NSHP) [27], but there was limited awareness of the policy. SHPs were poorly implemented and did not reach the standards set within the policy [28]. As in the current study, participants cited lack of funds and inadequate facilities [28]. These findings are consistent with

other research, mostly conducted in high-income countries, that has shown limited family and community involvement in enacting school health policies [29,30]. School feeding is another key element of NSHP in Nigeria. Research conducted a decade ago showed that a school feeding programme in Osun State, Nigeria, significantly improved the nutritional quality of school meals and the nutritional status of 160 pupils in the participating primary school [31]. More recent evaluations suggest inconsistencies in the delivery and effectiveness of school feeding programmes [32].

The concerns expressed by the child participants in our study indicated an interaction between individual and school environment factors, creating barriers to healthy eating and activity. Although there are operational regulations concerning safety and minimum quality standards of food in public schools, previous research has reported significant prevalence and poor knowledge of foodborne infections among school food vendors in Nigeria [33]. Studies have also shown limited access to soap in schools, inadequate water supplies and sanitation facilities, and therefore a lack of effective hygiene practices despite good knowledge about hygiene among school children [34,35]. A growing body of evidence indicates that access to safe drinking water, sanitation, and hygiene services has an important positive impact on nutrition, PA, and menstrual hygiene management [36–38]. As suggested in this study, clean water, sanitation facilities, and WASH literacy could be provided through active collaboration between schools, communities, and the public and private sectors [1].

Views centred around individual and interpersonal factors within the strategies for involving families theme. Health literacy classes for parents, the use of learning aids adapted to literacy levels and local dialects, and the involvement of religious leaders were all suggested as ways to engage families in interventions. Incorporating lay knowledge [39], and local language skills and concepts [40] into public health initiatives more widely, with messages shaped by cultural and religious contexts aligns with the need to address individual and interpersonal level factors in health promotion according to the SEM [17]. Significant environmental and policy change are generally not within the control of health professionals and thus require a political process and partnership with those with the power to make change to deliver multilevel health interventions [17,41]. Policy actors participated in the study. However, perhaps hampered by knowledge of government funding constraints, they provided recommendations that focused on individual-level responsibility. This was in addition to their suggestions of social responsibility schemes involving partnership between government and the corporate world to aid sustainability of health programmes.

In the schools as settings for interventions theme, participants felt that gardening could contribute to school feeding and therefore play an important role in healthy eating, although some adults raised concerns about the viability and sustainability of such gardens. Research has shown that school gardens can promote and strengthen home gardening, increase availability of fruit and vegetables, and improve dietary patterns, but evidence of sustainability is limited [42]. Further development and use of suitable experimental designs will assist in developing a better evidence base for school gardens and other community-based health interventions [43].

This study has provided the views of parents, children, and other key stakeholders in Nigeria which can be contrasted with the findings of previous studies conducted in Botswana, Malawi, and Mozambique [12–15]. Themes around the role of knowledge and beliefs, and environment and resources as barriers and facilitators of optimum diet and PA were in common with themes in these previous qualitative studies [12–15]. The current study provides novel data for Nigeria on potential practical solutions to the barriers identified, engaging families, a range of stakeholders working together, and suggestions for potential intervention components for improved diet and PA among school children.

#### 4.2. Strengths and Limitations

A wide range of relevant voices in this study has given insight into the views of parents, other adults, and children on diet and PA, solutions to address barriers to intervention activities that exist in low-income settings, how communities and families can be actively engaged, and how school can be an ideal setting for diet and PA interventions. Transferability to other settings depends on the context in which the research will be conducted, and the contexts to which the research findings are to be applied [10]. The detailed description (known as thick description) [44] of context and phenomena in the current study enable others to assess the findings' applicability to their own location.

Previous researchers have described a shared culture between participants and researcher as productive ground for accessing target populations, asking meaningful questions, nurturing rapport, and gaining understanding [45]. The lead author's (O.O.) positionality resulted in a similar positive experience with regard to access to child, parent, and wider community participants, fostering trust and openness in the discussions. The fluidity between an 'insider' position as a Nigerian with deep understanding of the role of religion and cultural norms in people's views, and as an 'outsider' researcher–clinician was also reflected on, and has similarly been reported by others [46]. This ensured 'fair dealing' [47] (p. 51) with regard to garnering a range of views across the study sample, and not just those that aligned with her own cultural norms or assumptions. Maintaining the reflexive diary, however, was challenging, and the need to move at a rapid pace and be flexible meant that adapting to some conditions was not possible. For example, although policy actors took part in the study, as noted above, they tended to be those in junior roles. More time and space to reflect may have led to identifying ways to engage with senior-level policymakers. The potential that this may have had in gaining greater understanding relevant to policy impact is not known. As described in the methods, transcripts and interim findings were provided to participants. Thus, another limitation of the study was that the desired feedback was not received, and therefore the intended respondent validation was not achieved.

#### 4.3. Implications for Further Research

In guidance for the development of complex interventions presented by O'Cathain et al. [48], the authors suggest that the phases of development are fluid and that there may be a period of preparation prior to formal intervention development. This preparatory phase could be conducted over a number of years and include qualitative research with stakeholders. The current study therefore contributes to a first stage of this suggested exploratory phase, helping to understand the problem that needs to be solved, the perspectives of potential end-users, and the context within which an intervention will need to work. The views presented in this study contributed to further research within this exploratory phase. This involved the development, feasibility, and acceptability of potential components of a future intervention promoting healthy diet and physical activity suggested in the findings reported in this paper. The work included collaboration between school and community, and the impetus for partnership and family-oriented principles prompted by the current study. The findings of this next stage of the research will be reported elsewhere, and will in turn provide the basis for the formal development and documentation of the full intervention, ready for pilot testing [48].

### 5. Conclusions

The aim of this qualitative cross-sectional study was to explore parents', children's, and other stake-holders' views on what might enable or hinder participation in diet and PA interventions with parental involvement, and potential intervention components likely to be feasible and acceptable. Within three overarching themes, the study highlighted considerations for childhood diet and PA intervention development in Nigeria, from child and adult perspectives. These themes elicited challenges to intervention development and implementation (including poor access to clean water and lack of safe outdoor play

space) and potential solutions to these concerns (such as increased security, infrastructure improvements using recycled materials, and health campaigns funded by local dignitaries). The feasibility and acceptability of grassroots suggestions for intervention components (for example, school gardening, sports competitions, and health literacy education for parents) and parental involvement could usefully be explored in future pilot studies.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su15107850/s1>, Table S1: Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist; Table S2: Additional supporting quotes.

**Author Contributions:** Conceptualization, O.O.; methodology, O.O.; supported by M.J.M. and T.A.A.; formal analysis, O.O. and M.J.M.; investigation, O.O.; writing—original draft preparation, O.O. and M.J.M.; writing—review and editing, O.O., M.J.M. and T.A.A.; supervision, M.J.M. and T.A.A. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki, and approved by the School of Health Ethics Committee, Leeds Beckett University (Ref: 52680, 12/11/2018) and from the Lagos State Ministries of Education and Health (Ref: EDIII/SCH.ADM/C.U/Vol.18/174, 11/3/2019).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on reasonable request from the corresponding author.

**Acknowledgments:** The authors would like to thank all those who supported the project and the participants who contributed to the study, without which the research would not have been possible.

**Conflicts of Interest:** The authors declare no conflict of interest.

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