BMJ Open

Addressing the marketing and availability of unhealthy food and beverages in and around selected schools in Ghana: a community readiness appraisal

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To cite: Tandoh A, Laar A, Pradeilles R, *et al*. Addressing the marketing and availability of unhealthy food and beverages in and around selected schools in Ghana: a community readiness appraisal. *BMJ Open* 2023;**13**:e075166. doi:10.1136/bmjopen-2023-075166

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2023-075166).

Received 28 April 2023
Accepted 21 August 2023

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ABSTRACT

Objective This study assessed stakeholder readiness to address unhealthy food and beverage marketing and availability in/around Public Basic Schools (for children 4–15 years) in Greater Accra Region, the highly urbanised administrative capital of Ghana.

Design The community readiness model was used to conduct in-depth mixed methods interviews with stakeholders. Using predefined anchored rating statements, quantitative readiness scores ranging from 1 to 9 were generated. Thematic qualitative analysis was undertaken to understand barriers and facilitators that could influence the implementation of interventions.

Setting Greater Accra Region, Ghana.

Participants 18 key informants from various school/education/citizen sectors, which together represented the 'school community' of Greater Accra Region.

Results The mean readiness scores indicated that the 'school community' was at the 'preplanning' stage of readiness (4.44±0.98) to address the marketing and availability of unhealthy food and beverages in and around schools. The mean readiness score for 'leadership' was the highest of all dimensions (5.36±1.60), corresponding to the 'preparation' stage. The lowest scores were found for 'community knowledge of efforts' (3.19±2.45) and 'resources for efforts' (3.64±0.87), both of which were at a 'vague awareness' stage.

Conclusions The 'school community' recognised that the marketing and availability of unhealthy food and beverages was a problem. Additionally, current leadership was actively supportive of continuing/improving efforts that create healthier children's food environments. However, actions that aim to increase the 'school community's' knowledge of existing interventions and securing resources to sustain those interventions are needed before introducing readiness appropriate strategies.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The community readiness model (CRM) integrates a community's context and stage of readiness, allowing for appropriate and acceptable interventions to address unhealthy food marketing and availability in and around schools.
⇒ CRM was conducted with an 'interest' community (rather than 'geographical'), that is, the 'school community'.
⇒ Qualitative data were collected to supplement quantitative CRM scoring, therefore, providing additional insight into barriers and facilitators that can be leveraged during intervention development.
⇒ The CRM captures readiness at the time of interviews; however, readiness is not necessarily static and could be subject to frequent change.

INTRODUCTION

Protecting children from food environments that do not provide diets that safeguard health and well-being is a global priority.[1] Broadly, food environments comprise the physical, economic, policy and sociocultural factors that impact diets at international, national and subnational levels.[2–5]

It is well recognised that the school setting provides an effective platform to deliver interventions that can promote healthier diets, and opportunities for equitable access to improved health outcomes for children from various socioeconomic backgrounds.[6 7] In many parts of the world, children spend between 7 and 8 hours at school every day, where they consume between a third to a half of their daily calories.[8 9] Most often, the domino effect of dietary behaviour and associated health outcomes during childhood extends into adulthood. Unhealthy diets can place children on a trajectory that can adversely affect their long-term prospects as adults, including an increased risk of developing diet-related diseases, low educational

attainment, low economic productivity and overall quality of life[10 11]

Currently, a growing body of evidence shows that food environments in and around schools in Ghana are characterised by heavy marketing and sale of ultra-processed foods and energy-dense and nutrient-poor foods and beverages.[12–15] Exposure to these unhealthy foods may adversely influence dietary behaviour in an environment lacking adequate policies and standards to counter unethical marketing and sale of foods to children.[16] The linkage between such school environments and Ghanaian children's consumption patterns has been documented.[13 17–19]

Recent estimates indicate that in the last two decades, the prevalence of overweight among Ghanaian children aged 5–19 years has almost doubled from 8.5% to 16.7% for girls and tripled from 2.6% to 7.4% for boys.[20] Additionally, it has been projected that by the year 2030, obesity will affect 6.6% of Ghanaian children aged 5–9 years and 4.1% of adolescents aged 10–19 years.[21] Therefore, there is a need for interventions that could improve Ghanaian children's food environments, including in and around school settings.

There are many considerations for the design and implementation of actions/activities that shape healthy food environments. As with other interventions, the potential to make significant impact is increased when beneficiaries and local stakeholders recognise an issue at hand as an important problem, demonstrate readiness to act, and are engaged as active participants in planning and implementing interventions that seek to solve the problem.[22]

The concept of readiness has been described as the 'degree' of preparedness to act on an issue and can be measured across multiple dimensions, and different community segments.[23] While several methods exist to assess readiness,[24] a widely used participatory tool that provides a framework to understand a community's readiness to act on an issue is the community readiness model (CRM).[23]

Inherent to CRM is the integration of a community's context, stage of readiness and resources available to 'develop effective, culturally appropriate and community-specific strategies' that address an issue of concern and also increase a community's level of readiness. The CRM tool has been applied to assess readiness to address various health issues including prevention of childhood obesity.[25–28] Recent studies in low-income and middle-income countries, such as Ghana, have used the model to assess readiness to promote healthier diets and prevent obesity/overweight in women and/or adolescents.[29 30]

To date, little is known about community readiness to reduce the widespread marketing and availability of unhealthy foods and beverages in and around Ghanaian schools. Engaging relevant stakeholders to determine their readiness and capacity to accept interventions to tackle this issue needs to be understood before introducing appropriate interventions. Against this backdrop, this study assessed the readiness of school stakeholders to accept interventions and determine the barriers and facilitators that could influence the implementation of interventions targeting unhealthy food and beverage marketing and availability in and around Public Basic Schools (for children aged 4–15 years) in the Greater Accra Region.

METHODS

Study community

The term 'community' typically covers a group of people who live in a defined geographical area and share common characteristics.[31] In this study, the interest community described as the 'school community' was operationally defined over the geographic area (Greater Accra Region, the highly urbanised administrative capital of Ghana) and stakeholders of interest.[32] The stakeholders of interest included individuals from within and outside the geographical area, with a responsibility or interest in child nutrition and health at the school level and adjudged to be able to provide in-depth viewpoints on existing actions, barriers and facilitators to address the marketing and availability of unhealthy foods in and around Public Basic Schools. Key informants were identified from six key sectors: (1) government (health and agriculture); (2) government (education and social protection); (3) regulatory and local government; (4) school authority/parent teacher association; (5) youth/student leadership and (6) non-governmental organisations (local, civil society and international organisations/United Nations (UN) specialised agencies).

Following the identification of relevant sectors, key considerations including recommendations in the CRM protocol to achieve theoretical saturation and maximum variation sampling to ensure a breadth of views across the 'school community',[33] guided the estimation of the number of stakeholders to interview. Developers of the CRM suggest that while it may be necessary to conduct more interviews in some communities, between 4 and 12 key informant interviews are 'often sufficient' to understand how a 'community' views an issue.[23] A brainstorming session by the research team identified 22 potential organisations, from the 6 sectors, that could have an impact on the issue of unhealthy food availability and marketing in and around schools. Key informants were recruited by sending written requests to relevant agencies/organisations and followed up with emails/phone calls. Eighteen people responded to participate. Four potentially relevant key informants from two sectors: government (education and social protection) and non-governmental organisations did not respond to the invitation to participate in the study.

Public Basic School system in Ghana

In Ghana, Public Basic Schools are non-residential, government funded and provide opportunities for learning at the kindergarten, primary and junior high

levels for children in ages 4–15 years. Children enrolled in Public Basic Schools spend about 40 hours per week in school for 40 weeks each year.[34] During school hours, most pupils consume at least one meal, either through food brought from home, provided by schools or sold within and around schools by often unregulated informal food vendors.[13 15 17]

Various policies and programmes have been formulated to support children's diets in Basic Schools. Key among these are the Ghana School Feeding Policy and the School Health Education Programme (SHEP) coordinated by the Ghana Education Service. Nutrition intervention areas under SHEP focus on promoting healthy eating habits among school children; identification, training and monitoring of school food vendors in food hygiene and micronutrient supplementation programmes among others.[35]

Issues assessed using the CRM

Unhealthy food availability

Unhealthy food items were described using a study specific operational definition informed by existing research including the Nutrient Profile Model for the WHO African Region[36] and an earlier study that had categorised the healthiness of foods available, marketed and commonly consumed in Ghana using research on nutrient profiling, nutrient density and energy scores.[37] Here, unhealthy foods comprised food items, such as sugar and sweet spreads; cakes and sweets; sugar-sweetened beverages/sodas; deep fried potatoes/yam/plantain and other fatty foods/dishes; condiments, such as salad dressing and mayonnaise. Additionally, unhealthy foods included food that was not safe to eat because it was unhygienic or contaminated.[29]

Unhealthy food marketing

Marketing refers to 'any form of commercial communication or message that is designed to, or has the effect of, increasing the recognition, appeal and/or consumption of particular products and services and comprises anything that acts to advertise or otherwise promote a product or service'.[38] Often, the marketing of unhealthy foods and beverages targeting children uses an array of techniques for commercial gain. These techniques include predatory marketing which has been defined as 'the subset of targeted marketing that promotes unhealthy products to vulnerable populations'.[39] Adapting these existing definitions, unhealthy food marketing was described in this study as the communication (using advertising, promotion and sponsorship) of ultra-processed/energy dense nutrient poor foods and beverages to Ghanaian children for commercial gain. Currently, national regulation on food marketing is through guidelines for the advertisement of foods issued by Ghana's Food and Drug Authority in accordance with the country's Public Health Act, 2012, Act 851. Specifically, the guidelines prohibit alcoholic beverage adverts targeted at children below 18 years and stationary outdoor adverts of alcoholic beverages within 200 m of Basic Schools[40]

Data collection

The interview guide included in the CRM protocol[23] was adapted for this study. This interview guide contains 36 open-ended questions addressing 5 readiness dimensions: community knowledge of efforts, leadership, community climate, community knowledge of the issue and resources. Two categories of questions are included in the guide: (1) mandatory questions for generating readiness scores and (2) optional questions which are not essential for determining readiness scores. In adapting the interview guide, we followed recommendations by authors of the CRM. First the issue of interest (ie, the marketing and availability of unhealthy foods and drinks to children in and around Basic Schools) was substituted at the sections noted in the questions. Additionally, we confirmed that the wording of questions would be understood in the Ghanaian context (online supplemental material—CRM interview guide). A pilot test was conducted with two key informants from different sectors within government (education and social protection; health and agriculture) to identify any potential issues with the interview guide and determine the feasibility of the data collection process, which was to be done via telephone because of the COVID-19 pandemic at that time. Following the pilot, some questions were rephrased to provide clarity and ensure key informants answered them in a consistent and meaningful way. Additionally, to avoid respondent fatigue, it was decided to keep interview questions to those essential for generating readiness scores.

Telephone interviews were conducted in English with 18 key informants between March and August 2021, lasting 30–60 min. The interviews were undertaken by two female researchers, AT (doctoral student) and a postdoctoral fellow working on the project. The two interviewers had relevant experience in qualitative methods and training in using the CRM tool. Some key informants (4/18) were professionally known to one interviewer through previous research projects but had no ongoing relationship at the time the interviews were conducted.

Each key informant provided informed consent and permission for the interview to be audiorecorded. As part of the informed consent process, participants were provided with detailed information about the study and the research team. Notes were taken and written up as summaries after each interview.

Data analysis

As specified in the CRM protocol,[23] each interview was transcribed verbatim and checked for accuracy. The interviews were then scored independently by two teams (AT/ALP and HO-K/GSA) using anchored rating scales to obtain a community readiness score for each dimension and an overall community readiness score on the nine-stage readiness scale. The nine stages of readiness

defined by the model range from 'no awareness' of the nature or extent of an issue through to a 'high level of community ownership' of ways to address the issue of concern (box 1).Where there were variations in scores, MH and RP reconciled differences and reached a consensus on what the score should be. The mean and SD for each dimension were calculated. The overall community readiness score was determined by finding the average readiness score for each of the five dimensions assessed. Thematic analysis of interview transcripts was undertaken to provide additional understanding of the quantitative scores obtained and determine possible barriers and facilitators that could influence interventions. Using a deductive/a priori approach, a codebook consisting of predetermined themes from a community readiness study previously implemented to improve diets in Ghana[29] was adapted and used to code all transcripts. Coding of the transcripts was undertaken by AT using NVivo.[41] Twenty-five per cent of transcripts were double coded by a second coder (AL) to confirm if the codebook was applied consistently. Any discrepancies identified during the double coding process were discussed to achieve consensus.

Box 1 The nine stages of readiness* of the community readiness model

⇒ Stage 1. No Awareness: The community and leaders believe that the issue is not a concern, and the community has no knowledge about local efforts addressing the issue.
⇒ Stage 2. Denial/resistance: Leadership and community members believe that the issue is not a concern, or they think it cannot or should not be addressed.
⇒ Stage 3. Vague awareness: Leadership and community members believe that the issue may be a concern but show no immediate motivation to act.
⇒ Stage 4. Preplanning: Leadership and community members acknowledge that the issue is a concern and that something must be done to address it.
⇒ Stage 5. Preparation: Leadership is actively supportive of continuing/improving current efforts/developing new efforts. The community is concerned about the issue and want to do something about it.
⇒ Stage 6. Initiation: Leadership plays a key role in planning, developing and/or implementing new, modified or increased efforts and some community members are involved in addressing the issue.
⇒ Stage 7. Stabilisation: Leadership is actively involved in ensuring/improving the long-term viability of the efforts to address the issue and there is ongoing community involvement in addressing the issue.
⇒ Stage 8. Confirmation/expansion: Leadership plays a key role in expanding and improving efforts. There is a high level of participation from community members and majority of the community strongly supports efforts or the need for efforts.
⇒ Stage 9. Community ownership: Leadership is continually reviewing evaluation results of the efforts and is modifying financial support accordingly. The community are highly supportive and actively involved in efforts to address an issue.

*Readiness levels for an issue can increase and decrease.
Source: Adapted from Oetting *et al*.[23]

Table 1 Characteristics of key informants (n=18)

		n
Sex	Male	7
	Female	11
Age category (years)	19–24	2
	35–44	7
	45–54	7
	55–64	2
Key informant sectors	Government—health and agriculture*	4
	Government—education and social protection†	3
	Regulatory and local government‡	4
	School authority/parent teacher association	2
	Youth/student leadership	2
	Non-governmental organisations §	3

*Government—health and agriculture included respondents from Ghana Health Service (Nutrition Department and Research and Healthy Policy Department), Ministry of Health, Ministry of Food and Agriculture.
†Government—education and social protection included respondents from School Health Education Programme, Ministry of Gender Children and Social Protection, Ministry of Education.
‡Regulatory and local government included respondents from Food and Drugs Authority and Accra Metropolitan Authority.
§Non-governmental organisations included respondents from local non-governmental organisations/civil society organisations and United Nations Specialised Agencies.

RESULTS

Sample characteristics

Characteristics of the 18 key informants (across 6 sectors) are presented in table 1; with 2–4 respondents interviewed per sector (11 female; 7 male).

Community readiness scores

Overall community readiness score

The overall community score was 4.44±0.98, corresponding to the 'preplanning' stage of readiness to address the marketing and availability of unhealthy food and beverages in and around Public Basic Schools in the Greater Accra Region of Ghana. Across the CRM dimensions assessed, some showed more readiness for change than others. The mean readiness scores ranged from 3.19 to 5.36 out of 9 (table 2). The 'preplanning' stage of readiness suggests that, overall, in the Greater Accra Region: (1) Some members of the 'school community' had, at least, heard about programmes and activities to address unhealthy food and beverage marketing and the availability in and around schools, but know little about them; (2) Leadership and community members acknowledged that the marketing and availability of unhealthy food and beverages in and around schools was a concern and that interventions were needed to address the issue; (3) Community members had some amount of knowledge

Table 2 Community readiness scores obtained from key informants (n=18)

	Knowledge of efforts	Leadership	Community climate	Knowledge of issue	Resources
Community mean scores (SD)	3.19 (2.45)	5.36 (1.60)	4.72 (1.47)	5.28 (0.99)	3.64 (0.87)
Overall readiness score (SD)	4.44 (0.98)	'Preplanning stage'			

about the marketing and availability of unhealthy food and beverages in and around schools and (4) There were limited resources that could be used for additional efforts to address the marketing and availability of unhealthy food and beverages in and around schools.

Mean readiness scores for each CRM dimension

Community knowledge of efforts

The score for 'community knowledge of efforts' was 3.19, corresponding to the 'vague awareness' stage of readiness. This was the lowest score among the five community readiness dimensions assessed in this study. At the 'vague awareness' stage, although there were programmes that aim to address the marketing and availability of unhealthy food and beverages, only a few community members had heard about them. Further, among those who had heard about efforts, they knew little about them. Ongoing programmes and activities were focused on food safety and hygiene, banning the sale of unhealthy foods and beverages by some schools, and nutrition education as part of the academic curriculum (eg, what constitutes a healthy diet and the benefits of choosing and eating healthy foods). The target groups for these programmes and activities included school children, caterers and food vendors. Additionally, some ongoing programmes, such as the Nutrition Friendly School Initiative, were being implemented on a pilot basis in selected schools within the Region (online supplemental table 1).

Leadership

'Leadership' comprising persons who have influence and could help to improve the healthiness of children's food environments—particularly in schools—were found to be at the 'preparation' stage of readiness to change. At this stage of readiness, leaders were actively supportive of continuing or improving current programmes and in developing new interventions that address the marketing and availability of unhealthy food in and around schools. While most key informants gauged the issue to be of some concern and priority for those in leadership roles, they thought that it could move higher up the concern and priority scale. Further, they noted that once leaders understood the importance of the issue at hand, they were likely to engage or play a key role to check the issue. Various categories of leaders mentioned by key informants to be influential in addressing the issue included: government ministries, departments and agencies (eg, Ghana Health Service, Ghana Education Service, SHEP; Ministry of Health; Food and Drugs Authority); local metropolitan, municipal and district assemblies; school heads; school groups such as parent teacher associations and traditional/local community leaders including chiefs, queen mothers and opinion leaders (online supplemental table 2).

Community climate

The prevailing attitude within the community was found to be at the 'preplanning' stage, with a readiness score of 4.74. Most community members acknowledged that the marketing and availability of unhealthy foods in and around schools was of concern and required interventions to address it. There was consensus among key informants that, although the issue was of concern to some community members, desire to address the issue was a low priority. That was because despite current efforts, children were still bombarded by heavy marketing, and unhealthy foods and beverages were sold by some community members in schools and the wider community. The involvement of some community members in the sale of unhealthy foods and beverages influenced their engagement with ongoing efforts to improve children's food environments. Whereas those who were concerned about the issue were willing to engage and support the implementation of efforts, community members involved in the sale of unhealthy foods and beverages were sometimes hesitant in supporting efforts, worried that it would negatively affect their livelihoods. Key informants noted that community members involved in driving efforts included opinion and traditional leaders, as well as parents with children enrolled in Basic Schools (online supplemental table 3).

Knowledge about the issue

The community's level of knowledge on aspects such as the occurrence of unhealthy food and beverage marketing and availability, its consequences on children's diets, factors leading to its occurrence and awareness of measures to prevent its occurrence was at the 'preparation' stage of readiness with a score of 5.28. Most key informants noted that although most community members were knowledgeable about the issue, its consequences on children and preventive measures, there were likely to be variations in their level of knowledge with some better informed than others. Furthermore, community members tended to have a greater level of knowledge on what influences the availability of unhealthy foods and beverages, as compared with the marketing of such foods. Regarding examples of factors contributing to the issue, key informants highlighted the lack of regulations to control the kinds of food sold in/around schools and the perception that children have a strong preference for unhealthy foods and beverages, meaning that it was

profitable to sell in and around schools. Misconceptions held by community members were centred around the benefits and health implications of unhealthy foods and beverages. Key informants reported that some of these misconceptions were driven by messages contained in adverts and widely held views that people had been consuming food items such as sugar sweetened beverages over many decades without experiencing negative health implications (online supplemental table 4).

Resources for efforts

The availability of resources, such as money, expertise and educational materials to support ongoing and future interventions to address the marketing and availability of unhealthy food and beverages in/around schools was found to be limited. The readiness score obtained was 3.64 corresponding to the 'vague awareness' stage. Key informants noted that resources to inform/educate people in the community mainly focused on the broad area of food and health, rather than on the issue of marketing and availability of unhealthy foods in and around schools. Further, this information was mostly shared on radio and television and sometimes through in-person visits to schools by health professionals.

Regarding the availability of funding to address the issue, most key informants acknowledged that while funding for ongoing/currents efforts largely came from UN specialised agencies and other donor partners/non-governmental organisations; there could be some government funding (although not specific to addressing the issue) available to relevant ministries and agencies that could be used to support efforts. Expertise identified to be involved in ongoing efforts or who could support future efforts included SHEP officers, nutrition officers and community health nurses. Further, there was the possibility of engaging volunteers to support efforts. Physical space to implement activities such as educational forums and stakeholder engagements to address the issue was reported to be widely available. Potential places mentioned by respondents included community parks, community centres, school halls and non-traditional virtual spaces such as Zoom. Key informants also reported that while most leaders and community members would support using the resources identified, the mobilisation of resources to address the issue was currently undertaken by government agencies, academia and other non-governmental organisations with little or no involvement from people within communities in the Greater Accra Region (online supplemental table 5).

DISCUSSION

Overall, this study found that the 'school community' was at the 'preplanning' stage of readiness, which suggests that community members recognised the problem of unhealthy food and beverage marketing and availability and the need for more efforts to structure school food environments to promote healthier eating among children. Qualitative findings indicate it was necessary for efforts to extend into the wider community to complement efforts implemented in schools. That was because in local neighbourhoods, children were exposed to unhealthy foods and beverages that could negatively affect the benefits of healthy food environments within schools. A systematic review to assess the effectiveness of school food environment interventions to improve dietary intake and prevent childhood obesity confirms our findings. This review reports that while school-based interventions were effective, regulatory policies on food and beverages within the broader community food environments were necessary to sustain healthy dietary habits/weight among children.[42]

An important policy option that could limit children's exposure to unhealthy food availability and marketing within and outside of schools are legislative restrictions by the government.[38] Indeed, a recent assessment of government's action, and priorities to improve food environments in Ghana identified legislation to regulate advertising and sale of unhealthy food as a high national priority.[16]

One barrier, this study identified, to implementing healthy food environment interventions was the concern about which alternative livelihoods could replace businesses selling unhealthy food and beverages to children in and around schools. This is consistent with findings in a previous study conducted in Ghana that focused on reducing unhealthy food and beverage consumption among women of reproductive age living in urban communities.[29] While many traders believed selling unhealthy food and beverages was driven by a reciprocal relationship with children's food preferences, efforts at increasing the food literacy of business owners could be beneficial to improve readiness to reduce unhealthy food and beverage availability. Additionally, interventions such as healthy store/supermarket initiatives that seek to support business owners to make gradual, sustainable and profitable changes to sell healthier food products could be piloted. In high-income countries where such initiatives have been implemented, evidence shows widespread public support[43] and a positive effect on accessibility to healthy foods by school children.[44]

Although overall the community was at the 'preplanning' readiness stage, the mean readiness score for 'leadership' and 'community knowledge about the issue' were at a higher stage of readiness (ie, the 'preparation' stage). The lowest scores were obtained for 'community knowledge of efforts' and 'resources for efforts' both of which were at a 'vague awareness' stage. Thus, increasing the 'school community's' readiness for the two lowest scoring dimensions was of priority. The authors of the CRM recommend that it is important to increase the readiness levels of dimensions that have the lowest scores before implementing any interventions that seek to address an issue.[23]

The 'vague awareness' stage of readiness observed for 'community knowledge of efforts' could be explained by a number of factors. For example, it is possible that

because ongoing programmes and activities had targeted recipients (ie, school children, food vendors and caterers), many community members were unaware of the scope or effectiveness of such efforts. Additionally, some programmes (eg, The Nutrition-Friendly Schools Initiative) were at the pilot stage in selected schools and may have contributed to community members having a low awareness. In the context of these findings, actions to raise the community's knowledge of existing efforts could include building collaborations and capacity of stakeholders who have considerable interest in children's food environments. These stakeholders could include parents/caregivers (through Parent Teacher Associations), school authorities and local opinion leaders and would serve as influencers for information dissemination and awareness creation. Existing studies have shown that parents and caregivers are in a uniquely influential position to support the successful implementation of community level interventions that seek to improve children's food environments.[45 46] Furthermore, other researchers have identified that increased collaborative partnerships with stakeholders is associated with improved community readiness and facilitating community change activities related to prioritised outcomes for an issue.[47]

Resources to support ongoing and initiate further efforts also had a low readiness score. While it was reported that there was government support for efforts with minimal funding, ongoing interventions and programmes were largely dependent on funds from international donor agencies. It has been reported that allocation for nutrition interventions in Ghana's national budget is meagre and often embedded in other budget lines.[48] Recently, national experts also identified the need for sufficient government funding for relevant research on diet-related non-communicable diseases in Ghana as high priority.[16] While partnerships with and financial support from international donor partners is an important resource, strong government funding and political willingness is essential to develop and sustain policies that improve food environments to support healthier eating.[49] More advocacy is, therefore, required to obtain funding from the government and also encourage local community members to be involved in mobilising resources to support interventions that address the marketing and availability of unhealthy food and beverages to children.

Broadly, the level of readiness determined across the dimensions in this study suggests the need for future interventions that focus on advocacy initiatives to stimulate community ownership and collaboration for a sustained reduction in the marketing and availability of unhealthy food and beverages in and around schools and beyond the school setting. Currently, there are ongoing initiatives in Ghana[50 51] that build on these readiness findings to advance advocacy and policy action. Specifically, these initiatives seek to create a favourable environment and stakeholder buy-in for food related fiscal measures as well as support the government of Ghana to develop a bundle of food-based policies that would enable healthier food environments and respond to the double burden of malnutrition.

Strengths and limitations of this study

The current study is the first in Ghana to assess the readiness of the 'school community' to reduce the marketing and availability of unhealthy food and beverages in and around Public Basic Schools. An added strength of this study is the inclusion of participants from diverse sectors involved in improving children's food environments. This resulted in eliciting a greater breadth of perspectives to understand the 'school community's' readiness for change. Furthermore, the addition of a qualitative component to the quantitative scoring helps shed light on the reasons behind the CRM scores. These strengths notwithstanding, this study has some limitations. Location and deprivation are important influencers on the prevailing food environment characteristics and could likely impact on readiness for the uptake and implementation of interventions.[52 53] This study determined an overall readiness for the Greater Accra Region but did not consider the level of socioeconomic deprivation for the various districts in the Region. There is ample evidence in the literature to show that schools located in deprived areas are more likely to have unhealthy food environments.[54 55] Therefore, it is possible that the readiness score for those communities would be different from that determined for the entire Greater Accra Region and could influence the uptake of interventions. Hence in rolling out interventions, broader social and economic issues need to be considered. Furthermore, issues related to the application of the CRM tool, such as key informant selection, and the 'snapshot' nature of the assessment[56–58] could have affected the readiness scores determined for the CRM dimensions.

CONCLUSION

There is awareness among the 'school community' about marketing and availability of unhealthy food and beverages in and around schools, but a low desire to act on the issue among locals living around schools. There is however a high level of active leadership for improving food environments for children. For any intervention to have maximum impact, initial actions must focus on increasing the community's knowledge of existing efforts and securing resources to initiate and sustain efforts.

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Acknowledgements We acknowledge the contribution of Dr. Phyllis Addo and Silver Nanema who supported data acquisition and transcription of interviews, respectively. We would also like to thank all key informants for participating in this study. This publication was made possible through support provided by IRD.

Contributors AL, MH, RNOA, CA and AT were involved in the conception and design of the study. AT collected, analysed, interpreted the data and wrote the first draft of the manuscript. RP, ALP, HO-K and GSA supported the analysis of data for the work. All authors provided critical inputs to the initial draft, read and approved the final manuscript. AL and AT are guarantors of this work.

Funding International Development Research Centre (award/grant number: 108983-001). AT is supported by a doctoral studentship from the MEALS4NCDs Project, University of Ghana, and an ARTS doctoral grant from the French National Research Institute for Sustainable Development (IRD).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by Ghana Health Service Ethics Review Committee (protocol number GHS-ERC 005/06/19) Ethics Committee for the Humanities, University of Ghana (protocol number: ECH 152/18-19). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request. The data supporting the findings of this study are available on reasonable request.

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REFERENCES

1 United Nations Children's Fund. *Protecting children's right to a healthy food environment*. Geneva: United Nations Children's Fund (UNICEF) and United Nations Human Rights Council (UNHRC), 2019.
2 Swinburn B, Sacks G, Vandevijvere S, *et al*. INFORMAS (international network for food and obesity/non-communicable diseases research, monitoring and action support): overview and key principles. *Obes Rev* 2013;14 Suppl 1:1–12.
3 Herforth A, Ahmed S. The food environment, its effects on dietary consumption, and potential for measurement within agriculture-nutrition interventions. *Food Sec* 2015;7:505–20.
4 Turner C, Aggarwal A, Walls H, *et al*. Concepts and critical perspectives for food environment research: a global framework with implications for action in low- and middle-income countries. *Global Food Security* 2018;18:93–101.
5 Downs SM, Ahmed S, Fanzo J, *et al*. Food environment typology: advancing an expanded definition, framework, and methodological approach for improved characterization of wild, cultivated, and built food environments toward sustainable diets. *Foods* 2020;9:532.
6 United Nations Standing Committee on Nutrition. *Schools as a system to improve nutrition. A new statement for school-based food and nutrition interventions*. United Nations Standing Committee on Nutrition (UNSCN), 2017.
7 World Health Organization. *Assessing the existing evidence base on school food and nutrition policies: a scoping review*. Geneva: World Health Organization, 2021.
8 Micha R, Karageorgou D, Bakogianni I, *et al*. Effectiveness of school food environment policies on children's dietary behaviors: a systematic review and meta-analysis. *PLoS One* 2018;13:e0194555.
9 World Health Organization. *Implementing school food and nutrition policies: a review of contextual factors*. Geneva: World Health Organization, 2021.
10 Patton GC, Olsson CA, Skirbekk V, *et al*. Adolescence and the next generation. *Nature* 2018;554:458–66.
11 Neufeld LM, Andrade EB, Ballonoff Suleiman A, *et al*. Food choice in transition: adolescent autonomy, agency, and the food environment. *The Lancet* 2022;399:185–97.
12 Green MA, Pradeilles R, Laar A, *et al*. Investigating foods and beverages sold and advertised in deprived urban neighbourhoods in Ghana and Kenya: a cross-sectional study. *BMJ Open* 2020;10:e035680.
13 Ogum-Alangea D, Aryeetey RNO, Gray HL, *et al*. Basic school pupils' food purchases during mid-morning break in urban Ghanaian schools. *PLoS One* 2020;15:e0238308.
14 Adjei AP, Amevinya GS, Quarpong W, *et al*. Availability of healthy and unhealthy foods in modern retail outlets located in selected districts of greater Accra region, Ghana. *Front Public Health* 2022;10:922447.
15 Amevinya GS, Vandevijvere S, Kelly B, *et al*. Advertising of unhealthy Foods and Beverages around primary and junior high schools in Ghana's most urbanized and populous region. *Front Public Health* 2022;10:917456.
16 Laar A, Barnes A, Aryeetey R, *et al*. Implementation of healthy food environment policies to prevent nutrition-related non-communicable diseases in Ghana: national experts' assessment of government action. *Food Policy* 2020;93:101907.
17 Fernandes M, Folson G, Aurino E, *et al*. A free lunch or a walk back home? the school food environment and dietary behaviours among children and adolescents in Ghana. *Food Secur* 2017;9:1073–90.
18 Ogum Alangea D, Aryeetey RN, Gray HL, *et al*. Dietary patterns and associated risk factors among school age children in urban Ghana. *BMC Nutr* 2018;4:22.
19 Abizari A-R, Ali Z. Dietary patterns and associated factors of schooling Ghanaian adolescents. *J Health Popul Nutr* 2019;38:5.
20 Global Nutrition Report. Country nutrition profiles (Ghana). Available: https://globalnutritionreport.org/resources/nutrition-profiles/africa/western-africa/ghana/ [Accessed 17 Nov 2022].
21 World Obesity Federation. *Global atlas on childnood obesity. Country report card for Ghana*. World Obesity Federation (WOF), 2019.
22 World Health Organization. *Participation as a driver of health equity*. Copenhagen: World Health Organization (WHO) Regional Office for Europe, 2019.
23 Oetting ER, Plested BA, Edwards RW, *et al*. *Community readiness for community change* 2nd edition. Tri-Ethnic Center Community Readiness Handbook, 2014.
24 Weiner BJ, Amick H, Lee S-YD. Conceptualization and measurement of organizational readiness for change: a review of the literature in health services research and other fields. *Med Care Res Rev* 2008;65:379–436.
25 Findholt N. Application of the community readiness model for childhood obesity prevention. *Public Health Nurs* 2007;24:565–70.
26 Kesten JM, Cameron N, Griffiths PL. Assessing community readiness for overweight and obesity prevention in pre-adolescent girls: a case study. *BMC Public Health* 2013;13:1205.
27 Harris KJ, Brown B, Shankle L, *et al*. Community readiness model for prevention planning: addressing childhood obesity in American Indian reservation communities. *J Racial Ethn Health Disparities* 2019;6:1144–56.
28 Niknam M, Omidvar N, Amiri P, *et al*. Community readiness for childhood obesity prevention programs: findings from an urban population in Iran. *Health Promot Int* 2021;36:824–35.
29 Pradeilles R, Marr C, Laar A, *et al*. How ready are communities to implement actions to improve diets of adolescent girls and women in urban Ghana *BMC Public Health* 2019;19:646.
30 Aberman N-L, Nisbett N, Amoafo A, *et al*. Assessing the readiness of small cities in Ghana to tackle overweight and obesity. *Food Sec* 2022;14:381–93.
31 World Health Organization. *Health promotion glossary*. Geneva: World Health Organization, 1998.
32 Laar A, Kelly B, Holdsworth M, *et al*. Providing measurement, evaluation, accountability, and leadership support (MEALS) for non-

communicable diseases prevention in Ghana: project implementation protocol. *Front Nutr* 2021;8:644320.
33 Sandelowski M. Sample size in qualitative research. *Res Nurs Health* 1995;18:179–83. 10.1002/nur.4770180211 Available: http://doi.wiley.com/10.1002/nur.v18:2
34 Ghana Education Service. New GES time table for basic schools. 2019. Available: https://ges.gov.gh/ [Accessed 15 Mar 2020].
35 Tandoh A, Amevinya GS, Addo P, *et al*. Nutrition-sensitive education and social protection policies have implications for food-based dietary guidelines for Ghana. *AJFAND* 2022;22:19386–416.
36 World Health Organization. *Regional Office for A. Nutrient profile model for the WHO African Region: a tool for implementing WHO recommendations on the marketing of foods and non-alcoholic beverages to children*. Brazzaville: World Health Organization. Regional Office for Africa, 2019.
37 Holdsworth M, Pradeilles R, Tandoh A, *et al*. Unhealthy eating practices of city-dwelling Africans in deprived neighbourhoods: evidence for policy action from Ghana and Kenya. *Glob Food Sec* 2020;26:100452.
38 World Health Assembly. *Marketing of food and non-alcoholic beverages to children (WHA63.14). World Health Assembly (WHA)*. Geneva: World Health Organization, 2010.
39 Fraser KT, Ilieva RT, James CJ, *et al*. Use of environmental scan to assess density, content, and variation of predatory food and beverage marketing in New York City. *Health & Place* 2022;76:102843.
40 Food and Drugs Authority. Guidelines for the advertisment of foods. 2016. Available: https://fdaghana.gov.gh/images/stories/pdfs/downloads/food%20guidelines/REVIEWED%20GUIDELINES%20FOR%20THE%20ADVERTISEMENT%20OF%20FOODS-28-1-16-FINAL-FINAL.pdf [Accessed 11 Jul 2023].
41 QSR International Pty Ltd. Nvivo (released in March 2020). 2020. Available: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home
42 Pineda E, Bascunan J, Sassi F. Improving the school food environment for the prevention of childhood obesity: what works and what doesn't. *Obes Rev* 2021;22:e13176.
43 Gómez-Donoso C, Sacks G, Vanderlee L, *et al*. Public support for healthy supermarket initiatives focused on product placement: a multi-country cross-sectional analysis of the 2018 international food policy study. *Int J Behav Nutr Phys Act* 2021;18:78.
44 Kim K, Hong SA, Yun SH, *et al*. The effect of a healthy school tuck shop program on the access of students to healthy foods. *Nutr Res Pract* 2012;6:138–45.
45 Luesse HB, Paul R, Gray HL, *et al*. Challenges and facilitators to promoting a healthy food environment and communicating effectively with parents to improve food behaviors of school children. *Matern Child Health J* 2018;22:958–67.
46 Reeve E, Thow A-M, Bell C, *et al*. Identifying opportunities to strengthen school food environments in the Pacific: a case study in Samoa. *BMC Public Health* 2021;21:246.
47 Anderson-Carpenter KD, Watson-Thompson J, Jones MD, *et al*. Improving community readiness for change through coalition capacity building: evidence from a multisite intervention. *J Community Psychol* 2017;45:486–99.
48 Laar A, Aryeetey RNO, Akparibo R, *et al*. Nutrition sensitivity of the 2014 budget statement of Republic of Ghana. *Proc Nutr Soc* 2015;74:526–32.
49 Mozaffarian D, Angell SY, Lang T, *et al*. Role of government policy in nutrition—barriers to and opportunities for healthier eating. *BMJ* 2018;361:k2426.
50 Advocating for Health (A4H) Project. Creating a favorable environment and Stakeholder buy-in for food-related fiscal policies in Ghana. 2022. Available: https://www.advocating4health.org [Accessed 31 Jul 2023].
51 Healthier Diets for Healthy Lives (HD4HL) Project. Developing evidence and action toward a double-duty food-based policy bundle to assure healthier diets in Ghana. 2022. Available: https://www.hd4hl.org [Accessed 31 Jul 2023].
52 Fraser LK, Edwards KL, Cade J, *et al*. The geography of fast food outlets: a review. *Int J Environ Res Public Health* 2010;7:2290–308.
53 Burgoine T, Forouhi NG, Griffin SJ, *et al*. Does neighborhood fast-food outlet exposure amplify inequalities in diet and obesity? A cross-sectional study. *Am J Clin Nutr* 2016;103:1540–7.
54 Grier S, Davis B. Are all proximity effects created equal? Fast food near schools and body weight among diverse adolescents. *Journal of Public Policy & Marketing* 2013;32:116–28.
55 Smets V, Vandevijvere S. Changes in retail food environments around schools over 12 years and associations with overweight and obesity among children and adolescents in Flanders, Belgium. *BMC Public Health* 2022;22:1570.
56 Beebe TJ, Harrison PA, Sharma A, *et al*. The community readiness survey:development and initial validation. *Eval Rev* 2001;25:55–71.
57 Mayer K. In response to the published article “application of the community readiness model for childhood obesity prevention (Findholt, 2007). *Public Health Nurs* 2008;25:389.
58 Sliwa S, Goldberg JP, Clark V, *et al*. Using the community readiness model to select communities for a community-wide obesity prevention intervention. *Prev Chronic Dis* 2011;8:A150.