Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Afr. J. Food Agric. Nutr. Dev. 2024; 24(4): 26094-26111 https://doi.org/10.18697/ajfand.129.23560

Date	Submitted	Accepted	Published
	19th June 2023	1st February 2024	27th April 2024

A TRAINING FRAMEWORK FOR FOOD HANDLERS IN THE NATIONAL SCHOOL NUTRITION PROGRAMME IN GAUTENG PROVINCE

Berejena T[1] and IC Kleynhans[1]

Tendaiishe Berejena

*Corresponding author email: KleynhansIC@tut.ac.za

[1]Department of Hospitality Management, Tshwane University of Technology, Pretoria, South Africa

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

ABSTRACT

The Department of Basic Education (DBE) in South Africa spearheads the National School Nutrition Program (NSNP), which is a holistic endeavour geared towards offering nourishing meals to students enrolled in public schools situated within financially disadvantaged neighborhoods. The selective responsive cluster training framework (SRCTF) aims to enhance skills development and competencies of food handlers, considering professional and ethical aspects. The key output of the NSNP is dependent on the skills competency levels of food handlers. The aim of the study was to develop a SRCTF for the NSNP for food handlers in Gauteng Province. Using mixed methods in the form of a convergent parallel design, the study includes structured questionnaires administered to NSNP food handlers, nutrition teacher coordinators, and school principals. The study identified both professional and ethical competencies as crucial factors for training through varimax rotation of a Likert scale questionnaire with 30 questions. The findings of this study highlight the lack of comprehensive training among NSNP food handlers in Gauteng Province, which is a common issue across South Africa and other countries. Pearson Chi-Square for independence confirms a significant relationship between training and skills competence levels among food handlers. For all food preparation competencies, the p-values were 0.000, indicating a significant relationship between training (independent variable) and competence levels (dependent variable). In response, a Selective Responsive Cluster Training Framework (SRCTF) is proposed specifically for NSNP food handlers in Gauteng Province. The two main competencies of the SRCTF will be the professional and ethical competencies. The main custodian of the NSNP is the DBE which should create a conducive environment for the training of food handlers within the identified clusters. Implementation of this framework would improve the overall performance and effectiveness of the NSNP. The food handlers training could lead to standard setting and certification of the NSNP food handlers on training.

Key words: Training framework, Nutrition, Food handler, Competences, Skills development

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

INTRODUCTION

The National School Nutrition Program (NSNP) is a comprehensive initiative led by the Department of Basic Education (DBE) in South Africa, aimed at providing nutritious meals to learners in public schools located in economically disadvantaged communities [1]. With a coverage of approximately 75.6 percent of all public schools nationwide [2], the program has been allocated significant government funding, totaling over R 8.5 billion (USD 455 million), to cater to the nutritional needs of more than 9 million learners across all nine provinces [3].

Although the NSNP has proven to be a crucial intervention, addressing immediate hunger and improving the overall health and well-being of school children, challenges persist. Despite the program's positive impacts, a substantial number of children continue to experience food shortages, particularly in urban areas, where 29.6% of children face food insecurity compared to 15.6% in rural areas [4]. Gauteng, in particular, faces significant challenges, with 22.2% of children experiencing hunger, the highest rate in the country, and a majority of them residing in urban areas (57.1%) [5]. This issue extends beyond South Africa, as global data reveals that in 2022, 153 million children attending schools in developing countries did so without having had a proper meal [6].

To address these challenges and enhance the effectiveness of the NSNP, it is crucial to focus on the development of food handlers within the program. Food handlers play a vital role in ensuring the provision of safe, hygienic, and nutritious meals to learners. Therefore, the development of a Selective Responsive Cluster Training Framework (SRCTF) specifically tailored to the needs of NSNP food handlers in Gauteng Province is imperative. This framework will provide targeted and responsive training opportunities to enhance the knowledge, skills, and practices of food handlers, enabling them to meet the program's objectives effectively.

By developing and then later implementing a Selective Responsive Cluster Training Framework, food handlers in Gauteng Province can receive comprehensive training that addresses specific challenges and requirements unique to their region. The common feature in African training frameworks for food handlers is the non-inclusion of diet and health aspects, food preparation skills, consumer education, communication and the non-certification of food handlers. Food handlers in the NSNP are unemployed members of the community and mostly women with children in the school who volunteer for these job opportunities. Many unemployed women seek these jobs as the volunteers are employed for a three-year and receive a salary and a social protection benefit. The recruits get training on the menu, food safety, good hygiene, good nutrition, occupational

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

health safety and handling inventory. This tailored approach will not only improve the quality and safety of meals provided but also contribute to the socioeconomic development of the province by promoting job creation and livelihood opportunities within the local economy [6].

National School Nutrition Program

The National School Nutrition Program (NSNP) in South Africa aims to provide employment opportunities for unemployed parents of learners in schools where the program is implemented. These parents are recruited as food handlers responsible for preparing and serving meals within the NSNP [7]. However, anecdotal evidence suggests that NSNP food handlers lack the necessary skills and knowledge to fulfil their duties effectively. The Partnership for Child Development (PCD) and New Partnership for Africa's Development (NEPAD) report highlights that although there is an annual training budget allocated for NSNP food handlers, training is not consistently implemented [8]. Inadequate funding, insufficient training staff, and high turnover rates among food handlers, who are recruited on an annual basis, contribute to this training deficit.

Deficiencies in food handlers' training have significant implications for both the beneficiaries of the NSNP and the food handlers themselves. Insufficient training can lead to unsafe food handling practices and cross-contamination, posing the risk of foodborne outbreaks and compromising the health and safety of the learners [9]. Tragically, there have been reported cases of 120 learners in Gauteng and the Eastern Cape Provinces who have been hospitalized after consuming contaminated meals provided by the NSNP [10]. However, such incidents are often underreported, despite the severe personal, academic, financial, and legal implications they present for schools and districts [11]. Inadequate knowledge and training among food handlers contribute to ignorance and negligence, increasing the risk of foodborne illnesses [12].

Developing a well-designed training framework for NSNP food handlers is essential to enhance their productivity, improve food safety practices, transform their lives, and contribute to local economies [13]. Training serves as a constructive development tool for both the workforce and the organisation, fostering profitable, adaptable, and efficient operations, as well as creating contented and productive employees [14].

However, studies have shown that training frameworks for food handlers in school nutrition programs in Africa are often incomplete, lacking adequate enabling policies, coordination, capacity, and up-to-date legislation and regulations [15]. The current training framework for NSNP food handlers has limitations as it primarily focuses on safety, hygiene standards, and gas usage. Crucial aspects

Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

such as diet and health education, comprehensive food preparation techniques, consumer awareness, and Hazard Analysis and Critical Control Points (HACCP) principles are not adequately addressed. (DBE) [16]. This makes NSNP appear fragmented, lacking proper coordination and comprehensive coverage [17]. Inadequate participation from key stakeholders, including government departments such as the Department of Health, has contributed to the deficiencies in the training framework for NSNP food handlers [2]. Consequently, important elements essential for effective training are overlooked, leading to a gap in knowledge and skills among food handlers. The current training frameworks in South Africa are in an embryonic stage, necessitating further development [18]. A comprehensive training framework should include provisions for the assessment and certification of food handlers, as emphasised by the DBE [16, 18].

MATERIALS AND METHODS

The aim of the study was to develop a selective responsive cluster training framework for the National School Nutrition programme for food handlers in Gauteng Province. In order to achieve the main aim, the following objectives were identified:

- To determine pre-service training to NSNP food handlers
- To determine the relationship between training and competence levels of NSNP food handlers
- To identify the most essential factors in training NSNP food handlers

The research design for this study is a descriptive and interpretive survey that is pursued through both quantitative and qualitative methods. It provides a greater precision in terms of measuring the data gathered, analyzing the current trends and aspects relevant to the study. In essence the quantitative approach is empirical and deductive in nature. A convergent parallel mixed method design was selected, which involves integrating and analysing both quantitative and qualitative data to complement each other. The purpose of this design is to incorporate an interactive approach where data collection and analysis drive changes in the data collection procedures [20].

Quantitative data for this study were collected using paper-based questionnaires administered to the research subjects. Face to face interviews conducted with the District Nutrition Coordinators (DNCs) provided the qualitative data for the current study Based on this background, the qualitative approach in this section of the study presents a narrative description and interpretation of data. In this paper only the quantitative aspects will be reported on.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

The target population for this study consisted of 305 secondary schools offering the NSNP across all 15 educational districts of Gauteng Province. Probability sampling was employed at each school to select one food handler, resulting in a sample of 290 NSNP food handlers.

Additionally, each of the 290 schools had the opportunity to provide either the school principal or the nutrition teacher coordinator, to respond to the questionnaire. Thus, a total of 110 secondary school principals, 180 nutrition teacher coordinators, and 290 NSNP food handlers completed the questionnaire.

Structured questionnaires were used as data collection instruments across three different units of assessment. It was decided to use questionnaires as it is an efficient method to collect data which is easy and reliable to analyse [21]. Questionnaires offer an objective means of collecting information about people's knowledge, beliefs, attitudes, and behavior [22]. The questionnaires were used to examine the challenges in the current situation to develop the framework. The questionnaires consisted of closed-ended questions designed to gather information on gender, educational background, contract periods, pre-service training, and challenges faced by NSNP food handlers. The competency skills of NSNP food handlers were rated by the respondents using a Likert scale, ranging from 1 (very poor) to 6 (excellent). The Likert scale was appropriate for measuring competence levels, providing respondents with a range of responses to capture variations in opinions or attitudes [23].

Ethical clearance was obtained from the university's ethical committee (FREC2017/FR/06/003-MS), and the researcher received a consent letter from the Gauteng Provincial Department of Education Directorate (Ref no.M2017/409) to conduct research in secondary schools across all 15 districts. Statistical data from the questionnaires was captured in an Excel spreadsheet, organising the raw data into workable formats and templates for further analysis. Stata v15 statistical analysis software was used to analyse the collected data. Descriptive statistics, factor analysis, Cronbach's alpha coefficient, and Pearson Chi-Square were employed as statistical techniques to determine and explain relationships between variables where the dependent variable was the competency levels and the independent variable, training. To identify the most essential factors in training NSNP food handlers, a Principal Component Factor Analysis (PCFA) with Varimax rotation was conducted.

RESULTS AND DISCUSSION

In order to develop the framework, it was necessary to determine what training takes place, and the limitations of this training. Regarding the pre-service training offered to NSNP food handlers, participants indicated that certain aspects received

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

more attention than others. Hygiene and safety (75.1%, n=218) and first aid (68.57%, n=199) were the primary focus areas of pre-service training. Over half of the respondents (53.06%, n=154) received training on customer care. However, the aspects covered in pre-service training for NSNP's food handlers revealed discrepancies and areas of neglect. Figure 1 presents an overview of the aspects which were not covered in pre-service training.

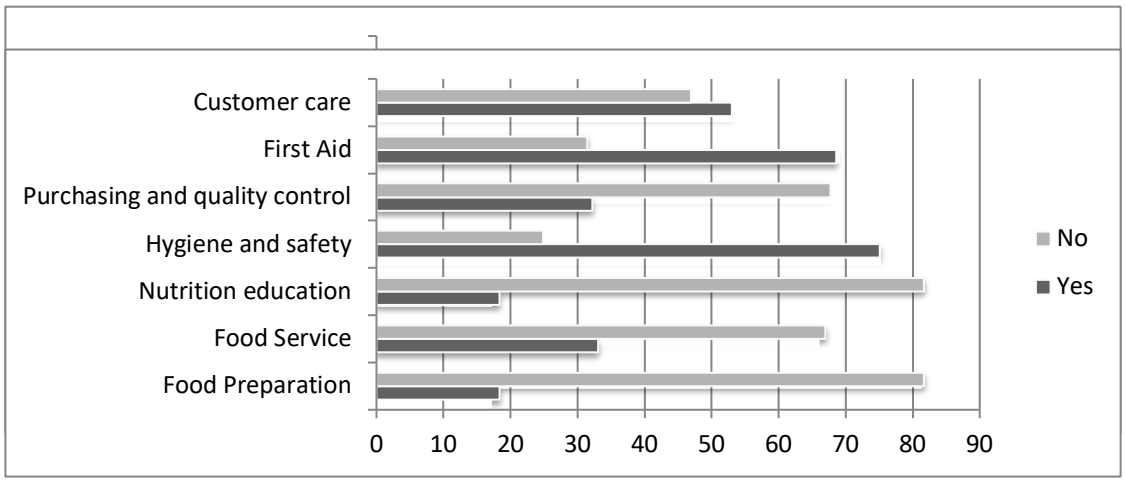

Figure 1: Aspects covered in pre-service training for the NSNP food handlers

Figure 1 illustrates that pre-service training for the NSNP food handlers in Gauteng Province does not prioritise aspects such as food preparation, nutrition education, purchasing, and quality control. Only a small proportion of participants reported receiving training in both food preparation and nutrition education, while the majority indicated a lack of training in most of the tested aspects. The findings of this study highlight the lack of comprehensive training among NSNP food handlers in Gauteng Province, which is a common issue across South Africa and other countries. It is evident that the majority of NSNP food handlers in South Africa lack proper training [24, 25]. These results were confirmed by a different study where food handlers from five districts lacked knowledge on adequate cooking procedures which affect food safety [26]. This report agrees with Sibanyoni *et al.* [27] who showed that in Mpumalanga province food handlers in the NNSP program had no knowledge of proper food handling procedures and lacked training on food safety. On the contrary, Chelule and Ranwedzi [28] also examining the NNSP program in Gauteng province, reported that food handlers were adequately trained on food handling practices although this did not translate into safe food handling practices. Similarly, a study in the school feeding program in one district in Ghana revealed that food handlers received no training in hygiene and nutrition [29]. This lack of training is in contrast to the NSNP operational guidelines for secondary schools, which emphasise the need for training in safety, hygiene standards, and gas usage [16],

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

while neglecting other crucial aspects such as diet and health, food preparation skills, consumer education, communication, and HACCP certification. This non-compliance with the Department of Health's guidelines [30] hinders the improvement of food handlers' skills and compromises the nutritional quality and safety of the meals served.

The assessment of food handlers' skills was obtained from the questionnaire administered to school principals/nutrition co-ordinators. A significant relationship was found between training and the competence levels of NSNP food handlers. Specifically, the level of food preparation competence skills differed significantly between those who attended food preparation training and those who did not (Table 1).

Table 1 reveals that for all food preparation competencies, the p-values were 0.000, indicating a significant relationship between training (independent variable) and competence levels (dependent variable). About 36.33% of those who did not attend training had a very poor skills level in basic food preparation, compared to only 8.89% of those who received training (p=0.000). Similar trends were observed for competencies related to knowledge of food handling processes (p=0.000), ability to use different cooking methods (p=0.000), use of conservative cooking methods (p=0.000), economic food preparation (p=0.000), and maintaining an organised working environment (p=0.000). These findings demonstrate that food preparation competence levels among NSNP food handlers are dependent on training. Nyawo *et al.* [26] in a study of food safety and hygiene knowledge, attitudes and practices among food handlers undertaken in Gauteng, reported that food handlers lack knowledge on food safety and this influences their practices during food preparation. These food handlers further pointed out that hygiene education can assist in adhering to food safety principles during food preparation [26]. Similar findings were also documented by researchers Sibanyoni, Tshabalala and Tabit [27] as well as Legbare and Selepe [31], also in the NNSP in other provinces in South Africa. The relationship between training and practices is not only applicable to School Feeding programmes but also to food handlers in hospital kitchens in South Africa [32], restaurant kitchens in Brazil [33] and informal food vendors in Kenya and Nigeria [34]. Employees value organisations that invest in their development, resulting in increased motivation, commitment, and productivity. Training also promotes self-development, self-confidence, and problem-solving skills [15].

In other studies, the inadequate training of NSNP food handlers has been linked to several challenges in food preparation [26]: nutrition education [27], and food safety [32]. Incompetence among food handlers has been associated with inadequacies in meal quality, and the DBE acknowledges that some hired women

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

in the NSNP may lack the knowledge and skills to provide nutritious and appealing meals [17]. Insufficient training in nutrition education, food preparation, and food safety undermines the effectiveness of the NSNP and compromises its goals. The absence of training in Hazard Analysis Critical Control Points (HACCP) is particularly concerning, as it is a crucial element for ensuring food safety and preventing foodborne illnesses [35].

Two Cronbach's alpha tests were conducted, demonstrating good internal consistency for factor 1 (Cronbach's alpha = 0.9721) and factor 2 (Cronbach's alpha = 0.9292). The reliability analysis of the nineteen items which loaded onto factor 1 (Professional competencies) was performed in this section of the study to determine the internal consistency. The scale on the ethical competencies (factor 2) was within a good internal consistency range with Cronbach alpha score of 0.9292. Thus, the scale could be regarded as reliable. To identify the most essential factors in training NSNP food handlers, a Principal Component Factor Analysis (PCFA) with Varimax rotation was conducted.

Table 2 presents the rotated factor loadings and unique variances. Based on the factor loadings, two factors out of 30 were identified as essential factors in training NSNP food handlers. Factor 1, labelled professional competencies, included 19 items related to professional knowledge and understanding required in food service units, particularly school nutrition programs. Factor 2, referred to as ethical competencies, comprised 10 items related to norms and ethics in food preparation and service environments. The variable related to Batho-Pele principles refers to “People First" which is about giving good customer service to the users of government services in South Africa. All public servants are required to practice Batho- Pele. These factors highlight the importance of incorporating both professional and ethical competencies in the training framework for NSNP food handlers.

These factors were also found to be important aspects needed in training by other researchers. Hygiene education could assist in decreasing the incidents of food poisoning [26]. There should be training on hazard analysis and critical control points (HACCP) [27]. Training should include subjects such as food cross-contamination, temperature controls, food preservation measures, food waste reduction, causes of foodborne disease, food poisoning bacteria, protection of food from bacteria, and proper use of cleaning chemicals/sanitation materials [26], meal planning [36], food preparation skills [37], food waste management [38], vegetable gardens [39] and nutrition knowledge [40, 36] should all be included in training frameworks.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

To address these challenges and improve the training of NSNP food handlers, a Selective Responsive Cluster Training Framework (SRCTF) is proposed (Fig 2). This framework takes into account the needs of the NSNP and the situation faced by food handlers after the expiration of their contracts. On the first level of the framework, the different role players who are involved in the administration, governance, and collaborations in the training of the NSNP food handlers are mentioned. The 3 main groups of role players are the qualification authorities (SDA, SAQA, and CATHSETA), the DBE (National office, the provincial office, and the district offices) and the inter-ministerial committees which include the Department of Education and Department of Agriculture who are responsible for training facilitation and training material. The DBE serves as the central coordinating body, developing the Human Resource Development Plan (HRDP) and regulating relationships with other government departments. The involvement of inter-ministerial committees, particularly the Department of Health, ensures regulation of training content, and the Department of Agriculture provides advice on food security.

On the second level, the District Nutrition Coordinators (DNCs) are proposed to be the centre-piece in the administration of training programmes. A direct mutual relationship is essential with other stakeholders. In particular, the DNCs are expected to coordinate the activities in schools and NGO's and suppliers. The DNCs play a crucial role in administering training programs and coordinating activities across clusters, schools, and NGOs. Schools provide the practical learning and continuous assessment necessary for food handlers' training, while support services contribute to training as part of their Corporate Social Responsibility.

Furthermore, the DNCs need to carry out skills audit and assessment programmes to ensure quality training in the training clusters (third level of the framework). The training clusters, divided according to the educational districts in Gauteng, aim to reduce costs and enhance convenience.

On the fourth level, the two factors have been identified in the study as the most essential competencies needed by the NSNP food handlers. These are the professional and ethical competencies. The professional competencies are food preparation, nutrition education, food health and safety, entrepreneurship and life skills and service excellence. The ethical competencies are courtesy and communication, team spirit, Ubuntu and observing cultural diversity. Ubuntu in the South African context or society is seen as the act of being human, caring, sympathy, empathy, forgiveness or any values of humanness towards others.

Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

The training of NSNP food handlers could be linked to a generalized training programme for food handlers, such as one of the Food and Beverage Sector Education and Training Authority (SETA)'s accredited programmes. After completion of such a programme, a short course on the specific conditions of school meals could be presented. This will help the DBE to respond to both the needs of the NSNP and the plight of the food handlers beyond the NSNP contracts.

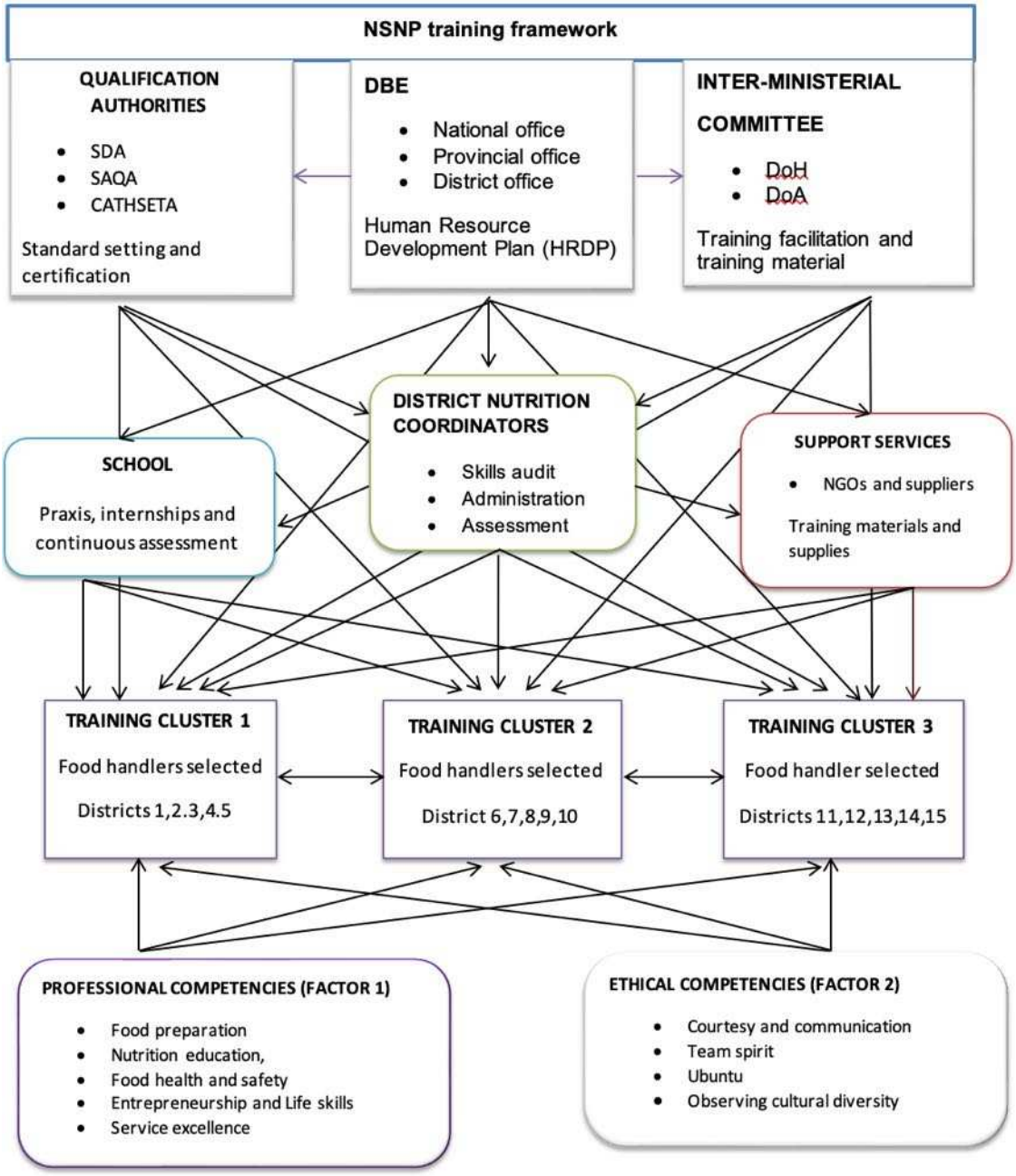

Figure 2: The Selective Responsive Cluster Training Framework (SRCTF) for the NSNP food handlers

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

To ensure the effectiveness of the NSNP, the food handlers have to be fully equipped with practical skills and comprehensive knowledge in food preparation, nutritional guidelines, health and safety, service excellence and life skills. The structured training framework developed in this study is theory based and founded in an empirical investigation conducted in the NSNP secondary schools in Gauteng province, South Africa. The developed framework provides criteria which will enable the DBE to effectively coordinate and administer training programmes for the NSNP food handlers. The convergence of different stakeholders in the framework will help in the provision of training material and the facilitation of training sessions. The clustering process fosters convenience in the management and administering of training sessions in the province. The selective criteria of food handlers to be trained will reduce training costs and ensures that food handlers in the appropriate age group are trained. It is recommended that the training framework be revised and updated to address the changing demands of the NSNP. Regular audits of training needs should be conducted through school visits by food and nutrition experts and specialists from the Department of Health. Training sessions should not focus excessively on a few areas while neglecting other important aspects. Practical components should be included in training sessions to enhance skills development. Further research is needed to test and evaluate the effectiveness of the SRCTF for NSNP food handlers.

Improving the training of NSNP food handlers is essential for enhancing meal quality, food safety, and overall effectiveness of the NSNP. In addition, the food handlers should also have an oversight of the regulations related to the NSNP.

ACKNOWLEDGEMENTS

We express our sincere gratitude to all the participants who generously contributed their time and efforts to make this study possible. We extend our heartfelt appreciation to the Department of Basic Education for their support and cooperation throughout this research endeavor.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Table 1: Relationship between food preparation competence levels and training (N=290) at Gauteng Province

Cross Tabulation								Chi-Square		
Competencies	**Pre-service training**	**Very Poor**	**Poor**	**Neither poor/ Good**	**Good**	**Very good**	**Excellent**	**Df**	**Value**	**P-Value**
Basic skills in food preparation	Yes	8.89	4.44	4.44	24.44	26.67	31.11			
	No	36.33	32.24	15.51	8.57	3.67	3.67	5	95.3423	0.000
Knowledge on food handling processes	Yes	8.89	8.89	8.89	20.00	37.78	15.56			
	No	29.39	40.82	15.10	7.76	4.08	2.86	5	82.9056	0.000
Ability to use different cooking methods	Yes	8.89	2.22	8.89	20.00	33.33	26.67			
	No	34.69	46.12	6.53	8.16	3.67	0.82	5	125.5558	0.000
Using the conservative methods of cooking	Yes	8.889	2.22	2.22	31.11	24.44	31.11			
	No	39.59	28.98	18.37	7.76	4.49	0.82	5	128.9204	0.000
Economic food preparation	Yes	8.89	8.89	4.44	20.00	33.33	24.44			
	No	33.47	34.29	10.61	10.20	3.67	7.76	5	71.0838	0.000
Organised working environment	Yes	8.89	4.44	4.44	24.44	26.67	31.11			
	No	36.33	32.24	15.51	8.57	3.67	3.67	5	95.3423	0.000

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Table 2: Professional (Factor 1) and ethical (Factor 2) competencies needed in the framework

Variable	Factor 1	Factor 2	Uniqueness
Basic skills in food preparation		0.5159	0.5876
Knowledge on food handling processes	0.6622	0.4547	0.3546
Knowledge and understating of cooking methods	0.7755		0.2960
Preparation of meals using conservative methods	0.6789	0.4796	0.3091
Economic principles in the preparation of meals	0.4796	0.6391	0.3615
Organising food preparation working environments	0.6670	0.4834	0.3214
Knowledge on nutritional value of different food groups	0.7454		0.3362
Knowledge on health eating habits	0.7964		0.2897
Ability to prepare special meals and therapeutic diets	0.7597		0.3326
Ability to assist learners with nutrition education	0.7316		0.3529
Ability to communicate effectively with learners	0.4657	0.6717	0.3320
Ability to write NSNP reports professionally	0.6652	0.4223	0.3792
Ability to do basic calculations in food preparation	0.6052	0.4885	0.3951
Ability to maintain hygiene and safety in the kitchen		0.7036	0.4728
Knowledge on personal hygiene in food environments		0.7308	0.4291
Understanding of food temperature control levels	0.6844	0.4401	0.3379
Understanding of responsibilities on health and safety	0.6480	0.6035	0.2159
Knowledge and understanding of food bone illnesses	0.7163	0.4306	0.3015
Knowledge on pathogenic and microbial infections	0.7688		0.3188
Knowledge and understanding of cross contamination	0.8255		0.2580
Knowledge on handling left over dishes	0.5430	0.5705	0.3797
An understanding of the Batho-Pele principles	0.4203	0.4296	0.6388
Ability to plan and manage time effectively	0.5345	0.6546	0.2858
Ability to work with others as a team member	0.4063	0.7252	0.3090
Ability to serve learners courteously	0.4937	0.6996	0.2669
Knowledge and understanding of cultural diversity	0.5151	0.6120	0.3601
Ability to identify business opportunities in food industry	0.6757	0.4521	0.3391
Ability to calculate risk in food service industry	0.7871		0.2868
Understanding of basic marketing principles	0.6867	0.4507	0.3252
Knowledge on basic costing and control measures	0.6188	0.4704	0.3958

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 24 No. 4
April 2024
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

REFERENCES

1. **Mensa C and A Karriem** Harnessing Public Food Procurement for Sustainable Rural Livelihoods in South Africa through the National School Nutrition Programme: A Qualitative Assessment of Contributions and Challenges. *Sustain*. 2021;**13**: 1-14. https://doi.org/10.3390/su

2. **Department of Planning, Monitoring and Evaluation and Department of Basic Education, South Africa.** Report on the implementation evaluation of the National School Nutrition Programme. Pretoria: Jet Education Services, 2016:17.

3. **Devereux S, Hochfeld T, Karriem A, Mensah C, Morahanye M, Msimango T, Mukubonda A, Naicker S, Nkomo G, Sanders D and M Sanousi** School feeding in South Africa: What we know, what we don't know, what we need to know what we need to do. Food security SA working White paper, 2018. South Africa: DST-NRF Centre of Excellence in Food Security.

4. **Steyn NP, Nel JH, Drummond L, Malczyk S and M Senekal** Has food security and nutritional status improved in children 1-<10 years in two provinces of South Africa between 1999 (National Food Consumption Survey) and 2018 (Provincial Dietary Intake Study (PDIS). *Int. J. Env. Res. Pub. He*, 2022; **19(3)**: 1038. https://doi.org/10.3390/ijerph19031038

5. **Statistics South Africa.** Quarterly Employment *Statistics* survey [datasets]. Pretoria: Stats SA, 2020.

6. **WFP.** A generation at risk: Nearly half of global food crisis hungry are children, say WFP, African Union Development Agency NEPAD, The Education Commission, and education partners, 2022.

7. **South Africa.** Cabinet Resolution, South Africa. Government Gazette, 2415, 2002, December 6, 65-68.

8. **PCD and NEPAD.** Case study of the National School Nutrition Programme. Pretoria: University of Pretoria, 2013, 57.

9. **Mafugu T** Challenges encountered in a South Africa school nutrition programme. *J. Pub. Health Res.*, 2021;**10**: 1982-1990.

10. **Nzimande B** Suspected food poisoning kills three pupils. ENCA, news, 2014 Retrieved from http://www.enca.com/suspected-food-poisoning-kills-three-pupils *Accessed November 2020.*

11. **WFP.** State of school feeding worldwide. Rome: United Nations, the World Bank, the Partners for Child Development, 2013, 65.

12. **Afolaranmi T, Hassan Z, Bello D and Z Misari** Knowledge and practice of food safety and hygiene among food vendors in primary schools in Jos, Plateau State, North Central Nigeria. E3 *J. Med. Res*., 2105; **4(2)**: 16-22.

13. **Brys B** The OECD skills strategy. A strategy approach to skills policy. Paris: OECD, 2015, 2.

14. **Kulkarni P** A literature review on training and development and quality work-life. *Int. Ref. Res. J.*, 2013; **2(4)**: 136-143.

15. **Mwamakamba L, Mensah P, Kwakye TA, Darkwah-Odame J, Jallow and F Maiga** Developing and maintaining national food safety control systems: Experiences from the WHO African region. Nairobi: African Scholarly Science Communications Trust, 2012.

16. **Department of Basic Education, South Africa.** National School Nutrition Programme annual report. Pretoria: Government Printer, 2015, 6.

17. **Graham L, Hochfeld T, Stuart L and M Van Gent** Evaluation study of the National School Nutrition Programme and the Tiger Brands Foundation in-school breakfast feeding programme in the Lady Frere and Qumbu Districts. Johannesburg: Centre for Social Development in Africa, 2015, 34.

18. **Department of Higher Education and Training, South Africa.** Competency framework for career development practitioners in South Africa. Pretoria: Government Printer, 2015.

19. **Mumba T and H Kesa** The causes of food waste in the National School Nutrition Programme in primary schools. *Afr. J. Hosp. Tour. Leis*, 2020; **9(4)**: 747-761. https://doi.org/10.46222/ajhtl.19770720-4

20. **Creswell JW and VL Clark** Designing and conducting mixed methods research (2nd ed.). London: Sage, 2022, 77.

21. **Zohrabi M** Mixed method research: Instruments, validity, reliability and reporting findings. *Theory Pract. Lang. Stud J.,* 2013; **3(2)**: 3254-262.

22. **Boynton PM** Selecting, designing and developing your questionnaire, 2004. https://doi.org/10.1136/bmj.328.7451.1312

23. **Heo CY, Kim B, Park K and RM Back** A comparison of Best-Worst scaling and Liker scale methods on peer-to-peer accommodation attributes. *J. Bus. Res.*, 2022; **148:** 368-377.

24. **Sibanyoni JJ** Food safety and quality assurance measures of the National School Nutrition Programme in Mpumalanga Province, South Africa. (D.Phil. thesis). Pretoria, University of South Africa, 2017.

25. **Xilumani D** Knowledge, attitudes and practices of food handlers regarding food hygiene and safety in school feeding schemes, Mopani District, South Africa. PhD diss., University of Johannesburg, 2023.

26. **Nyawo T, Kesa H and E Onyenweaku** Food Safety and Hygiene: Knowledge, Attitude and Practices among Food Handlers. *Afr. J. Hosp. Tour. Leis*, 2021; **10(2)**: 547-558. https://doi.org/10.46222/ajhtl.19770720-117

27. **Sibanyoni JJ, Papiso A and FT Tabit** Food safety knowledge and awareness of food handlers in school feeding programmes in Mpumalanga, South Africa, *Food Control*, 2017; **73**: 1397-1406.

28. **Chelule PK and M Ranwedzi** Volunteer Food Handlers' Safety Knowledge and Practices in Implementing National School Nutrition Programme in Gauteng North District, South Africa. *Safety,* 2022; **8(4)**: 67.

29. **Oduro-Ofori E and G Adwoa-Yebooh** The contribution of the Ghana schools feeding programme to basic school participation: A study of selected schools in the Kwaebibirim District, Ghana. Kwame Nkrumah University of Science and Technology, 2014.

30. **Department of Health, South Africa.** Policy for food service management in public health establishments. Pretoria: Government Printers, 2010.

31. **Legbara K and M Selepe** Nutrition knowledge of food handlers for national school nutrition programme (NSNP) in esikhaleni and Kwa-Dlangeza schools. *Afr. J. Hosp. Tour. Leis*, 2017; **6(4)**.

32. **Teffo LA and FT Tabit** An assessment of the food safety knowledge and attitudes of food handlers in hospitals. *BMC Pub Health,* 2020; **20**: 311.

33. **Rebouças LT, Santiago LB, Martins LS, Menezes ACR, Araújo Mda PN and RC de Castro Almeida** Food safety knowledge and practices of food handlers, head chefs and managers in hotels' restaurants of Salvador, Brazil. *Food Microbiol.,* 2017; **73**: 372–81.

34. **Christiana CD, Balali GI, Titus OO, Osafo R and M Taufiq** Food Safety in Sub-Sahara Africa, An insight into Ghana and Nigeria. *Environ Health Insights.* 2022; **16**. https://doi.org/10.1177/11786302221142 48

35. **Rheinlander T, Bakang MO, Takyi H, Konradsen F and H Samuelson** Keeping up appearances: Perceptions of street food safety in urban Kumasi, Ghana. *J. Urban Health*, 2008; **85(6)**: 952-964.

36. **Mafugu T** Challenges Encountered in a South African School Nutrition Programme. *J Public Health Res*., 2021;**10(1)**. https://doi.org/10.4081/jphr.2021.1982

37. **Nomatshila SC, Apalata TR and SA Mabunda** Perceptions of School Management on the Relationship between School Nutrition and Development of Non-Communicable Diseases in a Rural South African District: A Qualitative Study. *Int. J. Environ. Res. Public Health*., 2022; **19(1)**: 432. https://doi.org/10.3390/ijerph19010432

38. **Mumba T and H Kesa** The Causes of Food Waste in the National School Nutrition Programme in Primary Schools. *Afr. J. Hosp. Tour. Leis.*, 2020; **9(4)**: 747-761.

39. **Mawela A and G van den Berg** Management of school nutrition programmes to improve environmental justice in schools: a South African case study, *South Afr J Clin Nutr.* 2020; **33**:2, 30-35, https://doi.org/10.1080/16070658.2018.1507208

40. **Senetla T** Food Preparation and Nutritional Knowledge of Food Handlers in Gauteng Schools. 2021; University of Johannesburg (South Africa).