REPORT

LANDSCAPE ASSESSMENT OF NUTRITION EDUCATION IN THE DISTRICT OF COLUMBIA: KEY INFORMANT INTERVIEWS AND A SURVEY OF NUTRITION EDUCATORS IN NON-GOVERNMENTAL ADMINISTERED ORGANIZATIONS

Prepared for

DC Food Policy Council– Nutrition and Health Working Group

DC Office of Planning

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September 2022

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ACKNOWLEDGEMENT

I would like to express my deepest gratitude to Howard University faculty members Dr Linda Thompson, the advisor (retired), and Dr Chimene Castor, Co -advisor who provided technical support and guidance for this work.

Sincere thanks to the DC Food Policy Council – Nutrition and Health Working Group and organizations committed to the improvement of nutrition and health of residents through advocacy and policies that support funding and opportunities for improved access for nutrition education in D.C. Special thanks to Ona Balkus, Kristy McCarron, Dr Huang James, Tambra Stevenson, and Tariq Sheriff for the commitment throughout the project.

I wish to express my sincere gratitude to Dr Anastasia Sneiling, Chair and Professor Department of Health Studies, Robin McClave, Program Director, Healthy Schools, Healthy Communities and Ayanna Wells, Research Coordinator, Healthy Schools, Healthy Communities of American University for the guidance and resources provided to support this work.

I owe my deepest gratitude to the key informants that represented their organizations and provided valuable information which set the foundation for the study and the basis for development of the survey. The contributions provided by Robin McClave, Chris Brentin, Camille Range, Jenn Mampara, Emily Richardson, Brianne Studer, Ronnie Webb, Andrea Lopez, Willa Pohlman, Nicole Schenkman, Lisa Coleman, Tessa Mork, India Hinton, Anonymous and Anonymous is well appreciated. I will not fail to express my gratitude to the organizations that willingly offered to participate in the key informant interviews but were not eligible.

I would like to offer my deepest appreciations to the organizations that worked with the research team in the validation of the survey used in this study. The organizations are American University, Howard University, Iona Senior Services, DC Greens, Martha's Table, Centro Nia, Fresh Farms, City Blossoms, Common Good City Farm and Mary Center.

I am grateful to the Bainum Family Foundation for developing a free one-stop resource for finding more than 100 food-related nutrition education and job-training programs and organizations with over 400 sites throughout Washington, D.C., Maryland, and Virginia.

Lastly, I wish to express my sincere gratitude to all organizations and individuals that volunteered their time in one way or the other for the success of this work. Many thanks to the organizations that participated in the survey and shared insights that will ultimately inform future policies and programs for nutrition education in D.C.

"What lies behind us and what lies before us are tiny matters compared to what lies within us"
Ralph Waldo Emerson

1.0 SUMMARY

A Summit for Nutrition educators in the District of Columbia (DC) was held in August 2019 hosted by the DC Central Kitchen in collaboration with the University of the District of Columbia's College of Agriculture, Urban Sustainability, and Environmental Sciences. The Summit was designed for nutrition educators who provided services in the District of Columbia, with a goal to share best practices and resources and develop priorities for collaborative efforts.[1]

Attendees called for a comprehensive summary of nutrition education programs offered in the District to better understand the gaps and opportunities for expanding access to nutrition and food system education. In addition, a need for shared resources including curriculum, evaluation metrics, as well as funding coordination and asset mapping were identified.

As a result of the Summit, the DC Food Policy Council, Food and Nutrition Working Group, set a goal in 2020 to conduct a DC nutrition education landscape assessment. On the 3rd of June 2021, Dr. Linda Thompson and Dr. Oganya Udenyi of Howard University met with individuals representing non-governmental organizations that provided nutrition education in the District of Columbia, to discuss plans for data collection and tentative timelines for the landscape assessment and evaluation research. The purpose of a nutrition education landscape assessment and evaluation was to help the DC Food Policy Council, nutrition education practitioners and other stakeholders understand food and nutrition education programs, by identifying service gaps, redundancies, and to provide information toward aligning food and nutrition education goals citywide. In June 2021, Dr. Udenyi designed a data collection plan for the assessment and evaluation which began implementation January 2022.

Data Collection

The research assessment and evaluation were limited to non-governmental organizations, delivering nutrition education in D.C. A triangulation approach was used by the researcher: key informant interviews; pilot testing of a survey for educators developed from the key informant interviews; and administering of a validated survey to eligible organizations. Peer reviewed research on the subject matter was also included to strengthen the evidence and enhance validity of the results. Fourteen key informants were eligible for the interviews and participated virtually on Zoom for 30 - 40 minutes between January and February 2022. The interview responses were analyzed using NVivo version 12 which informed the development of a 39-item survey on Qualtrics. A feasibility study of the survey was conducted to test for the instrument content validity and reliability. Following the feasibility study, the validated survey was emailed to 114 organizations. Of the 85 organizations that responded, 81 were eligible to participate.
Results of the survey were analyzed using descriptive analysis. Based on the results, ten gaps and issues were identified that needed to be addressed and four key recommendations were made among which included a template for data collection and program evaluation.

Identified Gaps and Issues to be Addressed

I. Lack of a systematic program evaluation for participants.

- The organizations were conducting evaluations, however, a majority lacked a systematic evaluation process.
- The majority of the respondents did not conduct long-term follow-up with program participants, a key element of systematic program evaluation.
- Most respondents did not use validated tools for assessing their nutrition education programs.

II. Inconsistent nutrition education programs across Wards.

- There were gaps in the number and types of non-governmental nutrition education programs offered to residents among the Wards. In some Wards there were multiple sites with the same programming. In other Wards, there were very few programs offered. These inconsistencies contribute to information disparities among Wards. Most of the responding organizations provided nutrition education in schools, school-based gardens, and online.

III. Lack of coordination, collaboration, and environmental support.

- A lack of apparent coordination, collaboration and environmental support has resulted in a gap between program delivery and impact on chronic diseases. In some Wards there were a large number of the same nutrition topics covered, whereas in others, there was a lack of varied subject matter.
- Food insecurity, food deserts and other environmental factors (ex. safe places to walk) impact the ability of program participants to follow-up on recommendations from the nutrition educators.
- There is a gap between program delivery and impact on chronic diseases within the Wards. With respect to program impact on participants, the majority of the respondents have program sites in Ward 7 and in Ward 8. However, these Wards have the highest rates of obesity and diabetes in the District.

IV. Nutrition education program personnel and partner turnover

- Changing of personnel within organizations and among their partners, severely affected continuity, and sustainability of nutrition education programs. Participants of the key informant interviews expressed that school-based site turnover, and the ability to build relationships affected the effectiveness of nutrition education programming.

V. Time factor impact on nutrition education programs.

- Several nutrition educators interviewed reported not having enough time to adequately conduct evaluation and follow-up with participant due to not having sufficient time to devote to the program. For example, it took the Qualtrics survey participants an average of 5.5 days to complete a 39-item survey which should take no more than 30 - 40 minutes.

VI. Nutrition educators' knowledge gap regarding nutrition evaluation, assessment tools, and guiding theories.

- Less than half of the respondents used theoretical frameworks to guide the development of their nutrition education programs. In addition, ¼ of the programs were indifferent to, or not sure of, the effectiveness of their program.

VII. Lack of program funding.

- Seven percent (7%) of the respondents reported they were not receiving any funding for nutrition education programs.

VIII. Culturally relevant and tailored nutrition education.

- There is a lack of nutrition education programs targeted to Chinese, Arhamaic, Arabic and Creole populations. For example, approximately 70,100 Chinese immigrants live in DMV area,[2] however survey showed that only 6% of the organizations conducted education in Chinese, Armarhic, Arabic and Creole. In addition, key informants expressed that nutrition education should be translated in cultures in D.C.

IX. Lack of sufficient chronic disease specific nutrition education programs.

- The majority of the organizations (31%) provided education for anyone interested and don't target specific populations. In D.C., there is a need for more targeted communication to address specific health issues. The predominant nutrition education focus area was healthy eating, cooking, and tasting.

X. Non-nutritional professionals providing nutrition education.

- The survey revealed thirty eight percent (38%) of the organizations have non-nutritional professionals providing nutrition education. Licensed nutritionists and registered dietitians are well grounded in nutrition science and medical nutrition therapy. Additionally, nutrition education requires specific professional skills to design effective strategies for behavior change.[3]

Recommendations

To bridge the gaps and issues identified, and to increase opportunities for expanding access to nutrition education for residents in D.C., the following recommendations were offered:

1. Facilitate Training for nutrition educators on program assessment and evaluation.

- Organizations need to have a clear understanding of how to conduct formative and summative program evaluations.
- There is a need to conduct training for theory and research-based content in program design; program assessment and evaluation tool reliability and validity; program design and program delivery model. (Timeline: January 2023 through May 2023).

2. Fund Collaborative support for nutrition education programs.

- Funding is needed for training of organization personnel, materials to support educational sessions, hiring of personnel and to create a geographic information system (GIS) of

nutrition education programs that manages, analyzes, and maps current and future data collected.

- The GIS would ultimately improve communication and efficiency as well as better management and decision making. (Timeline: January 2023 through December 2023).

3. Establish Nutrition and Dietetic internship for implementation of a key performance indicator (KPI) for organizations.

- A key performance indicator is a criterion established by an organization to evaluate and track achievement of goals for overall performance and growth.
- Organizations need to work with local universities to leverage nutrition and dietetic students' skills in handling specific tasks (e.g., documentation, collation of data) for improved productivity. There is opportunity for organizations to incorporate working with interns as key performance indicator for appraisal. (Timeline: January 2023 – continues).

4. A template for data collection and program evaluation.

- Documentation is critical to effective delivery of nutrition education and long-term sustainability of behavior change in target audience. A template for daily/weekly documentation of nutrition education data is recommended for use in organizations. This template if properly implemented and utilized should enhance efficiency, generation of reports in real time, and provide comprehensive data for mid-year and end of year assessment and evaluation of nutrition education programs. (See attached Excel sheet). Timeline: September 2022 – continues.

Conclusion

To truly address chronic disease and food insecurity across the District of Columbia, there must be at a minimum coordination, and ideally collaboration, of efforts among organizations providing nutrition education. The ability to evaluate the effectiveness of nutrition education programs is paramount. Training for organizations in use of theoretical frameworks to develop programs and how to design program evaluations will enhance not only service delivery but will help to frame future programming. The use of a one- and- done approach for individuals attending nutrition programs is not sufficient to affect behavior change. Follow-up and monitoring of participants is key to help ensure the ability to incorporate what was learned in the program into lifestyle changes. Policy issues to address barriers to implementing recommendations (such as increasing intake of fresh fruits and vegetables in the midst of food deserts) is key. Finally, funding is needed to support community-based nutrition education, which is critical to addressing health disparities and contributing to the reversal of the epidemic of chronic disease in the District.

1.1 INTRODUCTION

On the 3rd of June 2021, a formal introduction was made between two members of the research team, Dr. Linda Thompson, and Dr. Oganya Udenyi of Howard University and key informants from non-governmental organizations in Washington, D.C. by the Association Director of Community Health, YMCA Metropolitan Washington, Kristy McCarron. This formal introduction was to inform individuals of the commencement of the Food Policy Council's *Food and Nutrition Education Assessment Research* with Howard University. This research was to provide an analysis of nutrition education programs in the District of Columbia with the hope that it would inform an evaluation and needs assessment of nutrition education, and ultimately future policies and programs. This section presents a background of the landscape assessment and evaluation of nutrition education in D.C., purpose of the nutrition education landscape assessment and evaluation, and the scope of the landscape assessment and evaluation of nutrition education research.

1.2 Background

In August 2019, the District of Columbia (DC) Central Kitchen hosted a summit in collaboration with the University of the District of Columbia's College of Agriculture, Urban Sustainability, and Environmental Sciences. The theme of the Summit was "The Nutrition Educator Summit," and it was designed for on-the-ground educators, aiming to create a community practice across the large network of nutrition educators in Washington D.C. The summit was sponsored by the Bainum Family Foundation. The Foundation presented a free one-stop resource for finding more than 100 food-related nutrition education and on the job-training programs and organizations with over 400 sites throughout Washington, D.C., Maryland, and Virginia.[4] The goal of the free one-stop resource known as "Food Learning Locator" is to enable

organizations, community members, funders, and community advocates to connect, collaborate and easily navigate food-education and job- training opportunities available in mid-Atlantic area. Despite the Food Learning Locator, nutrition educators working in community programming have lacked a database to consolidate the many resources available in Washington, D.C.

As a matter of priority, educators at the summit called for a comprehensive summary of nutrition education programs to better understand the gaps and opportunities for expanding access to nutrition and food system education for D.C. residents. An understanding of the outcomes should enhance collaboration among D.C. nutrition educators. Very importantly, a need for shared resources including curriculum, evaluation metrics, funding coordination, and asset mapping was identified. A well-organized collaborative approach would enable food and nutrition educators achieve their goals. Unfortunately, healthcare providers are unaware of nutrition education resources available to patients.

A 2020 goal of the Food Policy Council's (FPC) Food and Nutrition Education Working group was to conduct a D.C. nutrition education landscape assessment that would inform an evaluation and needs assessment. This was seen as a way for the city to ultimately fund more nutrition education for kids, adults, and seniors. After initial conversations with local researchers, it was decided that the best next steps were to conduct a landscape assessment via informed interviews, which would then inform an evaluation and needs assessment of nutrition and food education across the district.

1.3 Purpose

The purpose of this nutrition education landscape assessment is to help the DC Food Policy Council, nutrition education practitioners and other stakeholders understand food and nutrition education programs in the District, identify service gaps, redundancies, and provide information toward aligning food and nutrition education goals citywide.

1.4 Scope

The landscape assessment of nutrition education was limited to organizations administered by non-governmental organizations (NGOs) and delivering nutrition education in D.C.

2. LANDSCAPE ASSESSMENT AND EVALUATION OF NUTRITION EDUCATION

This section presents information on the methods by which the landscape assessment and evaluation was conducted, results of the key informant interviews and surveys. In addition, this section addresses the five questions of interest to the DC Food Policy Council - Nutrition and Health Working Group, using the qualitative assessment of key informants' responses and quantitative evaluation of nutrition educators' survey results. The results were interpreted using a mixed methods approach. Also, this section addresses gaps and issues identified in nutrition education services in the District of Columbia. In addition, a recommended template for data collection and evaluation of nutrition education provided by non-governmental organizations is included.

2.1 Methodological information

The researcher utilized triangulation (peer-reviewed articles, qualitative, and quantitative) approach for the study. Triangulation is a technique to analyze results of the same study using different methods of data collection to enhance validity, to create a more in-depth picture of a research problem, and to interrogate different ways of understanding a research problem (Tashakkeri Teddie,2003).[5]

Key informant interviews – Twenty (n=20) non-governmental organizations within D.C. that provide nutrition education were recruited, fourteen (n=14) were eligible for the key informant interviews. The interviews were conducted virtually (Zoom) and lasted about 30 - 40 minutes. The interviews were spread over a four-week period, between January 25, 2022, to February 18, 2022.

Eligibility for key informant interviews – The eligibility criteria for key informants were based on the Society for Nutrition Education and Behavior (SNEB) competencies for nutrition educators' section 9.1.[6] The screening criteria for eligibility of the participants include participants should be able to communicate effectively in visual and oral form with individuals and groups, in ways that are appropriate for diverse audience. Eligible participants should be between age 22 – 55 years and should provide nutrition education in a non- governmental administered food and nutrition organization in D.C.

Feasibility Study (Pilot Test) and Validation of Survey - A pretest of the online (Qualtrics), 39 - item self-administered survey was conducted for content validity and reliability. This was achieved by conducting a feasibility (pilot) study on a representation of the target population of nutrition educators. A link to the survey on Qualtrics was emailed to nutrition educators in ten (n =10) different non-governmental organizations.

Survey - Upon validation of the instrument, emails with a link to the survey on Qualtrics was sent out to nutrition educators in one hundred and fourteen (n=114) non-governmental organizations and private practice groups in D.C. Respondents consented to the voluntary participation, confidentiality, and agreement statement before participation in the survey. Eighty-five (n=85) organizations and private practice groups responded to participation in the survey however only eighty-one were eligible (n=81) and participated in the survey. The responses were recorded automatically upon submission. Data collection was spread over a period of four weeks from May 12, 2022, to June 2, 2022. Analyses of data collected from the key informant interviews and survey is reported subsequently.

2.2 Results of the Key Informant Interviews

The key informant interviews were guided by five questions (see appendix), supported with probing from a self-made questionnaire to ensure clarity of responses. Ultimately, the goal of the key informant questionnaire was to address five research questions of interest to the DC Food Policy Council outlined as follows:

1. What is the need for nutrition education in D.C?

2.What are current food and nutrition efforts in D.C. (demographics of who is programming, who programs are for, where are they located, how individuals are connected to programs, operations of programs)?

3. How do programs measure their impact and what are the results?

4. What are the gains and losses of D.C. investing or not investing in nutrition education?

5. What are recommendations to close the gap using policy interventions and investments to include: time, talent, training, and traits?

Research questions one, two and three are addressed by the thematic analysis of key informant interviews while research questions four and five are addressed later in the report essentially by the results from the survey and supported by key informant interview results.

The researcher conducted a thematic analysis using NVivo version 12 for the qualitative data analysis of key informant interviews. The thematic analysis was carried out according to the steps outlined by Braun and Clarke (2006).[7] A description of each interviewed participant is indicated in table 1 below. Thirteen (13) participants (93%) were females, and one (1) participant (7%) was male.

Table 1

Descriptive Data

Participant Key Informant (KI)	Sex	Title	Credential
Participant 1	Female	Community Nutritionist	RDN
Participant 2	Female	Program Director	RDN
Participant 3	Female	Program Manager	RDN
Participant 4	Female	Director of Programs	RDN
Participant 5	Male	Program Director	LN
Participant 6	Female	Program Director	RDN
Participant 7	Female	Nutrition Consultant	RDN
Participant 8	Female	Communications & Outreach Mgr.	RDN
Participant 9	Female	Program Director	RDN
Participant 10	Female	Program Director	RDN
Participant 11	Female	Director of Programs	RDN
Participant 12	Female	Head of Nutrition Education	RDN
Participant 13	Female	Dietitian	RDN
Participant 14	Female	Health & Wellness Director	RDN

Research question #1: What is the need for nutrition education in D.C?

Based on the analysis of the key informant interviews, five themes emerged to answer research question one. All data italicized and in bolded quotes represent the unaltered words of participants. The themes in response to research question one is stated as follows:

I. Special nutritional needs throughout the life cycle require skills and competencies delivered through nutrition education.

The interviews with key informants revealed that nutrition education is a critical component in addressing the nutritional needs of populations with special needs. For example, **Participant #1** expressed ***"We are predominantly in elementary schools and so that's anywhere from Kindergarten to 5th grade. In addition, we also participate at schools with students who have special needs as far as special populations"***

In the same vein, **Participant #3** explained how their organization addressed special needs for older adults through the nutrition education provided with the quote: ***"We'll include information on food recipes and then some information about how it can affect your health, such as heart health, cancer prevention and blood pressure. Keeping it general, like metabolic disease, diabetes, and we'll talk about protein and the protein needs of older adults and if we don't do in person, we'll have similar handouts and information"***

Hence, special nutritional needs associated with different stages in the life cycle (for example, seniors) or in certain health conditions (for ex. children with autism, Alzheimer's) indicate a need for nutrition education.

II. Vulnerable and marginalized population have less access to resources to maximize nutrition education programs in the community.

During the interviews, key informants expressed that majority of the population they served were low-income earners with so many demands on the low incomed they earned. For example, **Participant #3** expressed that there is a high level of food insecurity among the population that their organization provided nutrition education for, and there was a need for resources in the organization to bridge the gap with this quote: ***"Satisfying needs for money management and budget so they are as healthy and independent as they can be, and we provide resources for that. There's a lot of food insecurity, that's my major population is food insecure, so combating food insecurity in this population is a priority"***

In the same light, **Participant #14** explained how creativity and ideas are incorporated into the nutrition education provided for the pregnant and breastfeeding female adult population they serve, living in food insecure areas. These clients have appetite to eat small meals or small snacks, and some others live on substance abuse. This quote by **Participant #14** expresses this: ***"We also have 'remixed the junk' healthy snack ideas because a lot of our clients live in food insecure areas, and they really only have access most of the times to healthy corner stores and a lot of the times have the appetite and the desire to eat small meals or small snacks. So, this is a very important class and in a very important point where we can capture and educate appropriately. We also have a class on nutrition education that we offer on substance use and smoking cessation, discussing you know, tobacco smoke and marijuana use and other forms of substance use and then we kind of tap into micronutrients and vitamin deficiencies that are associated with substance use and smoking"***

Accordingly, the need for nutrition education especially among for low-income populations is a priority to enhance access to resources and healthy food.

III. Impact of COVID -19 on nutrition education increased participant attrition and significantly dropped positive reinforcement of education through hands on experience.

The key informants expressed during the interviews that the pandemic had changed the dynamics of nutrition education programming with significant impact on participating numbers in some sites and behavior change.

For example, **Participant #5** expressed concern about the impact of the pandemic on participants engagement and attrition with the quote: ***"We did an evaluation over the summer of our programs, and though we saw participants you know enjoying virtual classes because we did not see strong behavior changes coming out of those classes as we did the in person classes and we have a bit more attrition within our virtual classes than we did our in person classes, so I don't have hard data to back up the efficacy of that, but I am just assuming that the attrition that we're seeing is making these classes a bit less effective in a virtual setting"***

As regards hands on experiential learning, participants direct engagement through cooking classes, food demos etc., dropped because of programs switching to virtual classes. For example, **Participant #11** stated that the organization's philosophy is always hands on and creating a fun environment. Program participants have missed that experience because of the pandemic. The quote reads: ***"Since COVID we've been virtual, so we've still been targeting areas like Wards five, seven and eight, but of course virtually……. our philosophy is always hands on and creating a fun environment and integrating cooking as hands on cooking as well as the nutritional information"***

Therefore, the need for nutrition education has increased due to the impact of pandemic on overall program effectiveness.

IV. Prioritize nutrition education with clear goals in the organization.

During the interviews, key informants expressed that nutrition education needs to be a priority and at the forefront of the mission and vision of the organization with clear goals and not a piece of a broader program. For example, **Participant #2** said ***"We've kind of handled nutrition education as a piece of a program and have not set specific goals for nutrition education so I can't say that we have tracked exactly how well we've met those, I think we are effectively providing nutrition education. So, if the goal is just to provide some education, then yes. But we haven't really looked at it that way as the high focus of the program, it's like one element"***

The Table 2 below summarizes the themes in response to research question number one.

Table 2: Summary of themes in response to research question number one: What is the need for nutrition education in DC?

- Special nutritional needs throughout the life cycle require skills and competencies delivered through nutrition education.
- Vulnerable and marginalized population have less access to resources to maximize nutrition education programs in the community.
- Impact of COVID -19 on nutrition education increased participant attrition and significantly dropped positive reinforcement of education through hands on experience.
- Prioritize nutrition education with clear goals in the organization.
    - Nutrition education is not at the fore front of the mission and vision of most of the organizations, though nutrition educators all agreed it was vital, most of the organizations lacked clear goals for nutrition education because it was a piece of a broader program.

Research question #2: What are current food and nutrition efforts in D.C. (demographics of who is programming, who programs are for, where are they located, how individuals are connected to programs, operations of programs)?

The qualitative analysis of key informant interviews showed that current food and nutrition efforts in D.C., are a broad range of programs focusing on food access and economic mobility, urban management, food security, food safety, school and food garden support, school health and wellness projects, early childhood programs, urban farming, perinatal and post-partum health

awareness. Additionally, food and nutrition efforts focused on individuals who qualify for the Supplemental Nutrition Assistant Program (SNAP) and focused on provision of nutrition education and counselling for senior citizens.

Of the fourteen interview participants, only two reported that they were working for organizations or in roles that focused on nutrition education only. The rest of the participants were working for organizations that offered nutrition education as an element of wider programs. Table 3 below is a summary of the description of programs that focused primarily on nutrition education provided by the organizations. Table 3 describes who programs are for, where they are located, how individuals are connected to programs and operations of programs. The demographics of who directs or manages nutrition education programming is described in Table one earlier reported.

Table 3: Key informant description of current nutrition education efforts in D.C.

Nutrition education Programs, Operations, and individual connections	**Target audience for Programs and Location**
Participant #1 School-based Markets • Program is run by a grant through the Department of Health (DOH). • School-based food markets are in wards 7 and 8 where fresh produce and ingredients are provided for families at those schools. • Community nutritionist provides different types of nutrition education materials as relates to the marketplace. • Community-based events are held in Partnerships with organizations such as SNAP ED through the DOH Food prints. • Key activities on the market include nutrition education and cooking demonstrations. • Chef educators/Market Leaders at schools coordinate cooking demos/Quick model – quick grab activities 5- 20 minutes for after school kids, provide nutrition education and cooking demos at the school-based markets. • Outside the school-based markets activities include partnership with Giant Foods on Diabetes education (45- 60 minutes class), back to basics class held in summer (6-8 weeks) families learn basic skills as relates to eating experience – cutting skills, food safety skills. • Other program activities include garden experience such as sensory garden, like smell, pick, touch, feel, and taste for younger students at the early childhood education centers.	• Elementary school students (first – fifth grade), recently, middle school and high school. • Intergenerational (families, grandma, mom, and a child living at home). • School children with special needs. • Ethnicity, predominantly African Americans **Location of Program** • 50 to 60 sites in schools located in Wards 7 and Wards 8.

Participant #2 After school program • Program focuses on building community in the local neighborhood. • Provides resources to people of color and less financially privileged. • Delivers lessons about food and ability to utilize market and farm to get fresh food. • Program happens twice a week with a lesson on a certain theme, with cooking classes touching a little bit about what ingredients is being used and what nutrition is contained in the ingredients. • Depending on the format of the program for the year, nutrition classes could run every few weeks or a month long. • Average class is 10 -12 students and 35-40 in a month. Some of the students are repeat students who come back for the classes. • The classes begin with lessons, specifically teaching certain nutrition principles, like MyPlate or eating rainbow, eating healthy and different nutrition. • Handouts are provided for families with kids at the markets or directly to the kids in their program kits. • Program is FREE	• A lot of students in the pre-K to 3rd grade age range and some a little older. • Elementary aged students. • A rolling mix of students from different ethnic backgrounds. • Black, white, and other students of color and mixed ethnicities. **Location of Program** • Zip code 2001, 2002
Participant #3 Food security program • Program focuses on provision of resources for older adults that need them, strives to ensure people age with good health, social management, satisfying needs for money management and are as independent as they can be. • Online nutrition education around town DC, cooking demonstrations, cooking done directly by program or contracted to a chef or cook and moderated by the organization.	• Seniors aged 60- 75 years. • Ward 3 and information for clients are tracked. • Participants are open to come from all around DC, however target audience for the program are in Ward 3. • Clients from anywhere in DC can participate.

• Classes include wellness-based question and answer sessions. Nutrition education held in person pre -COVID at St Albans Community Dining site. Lecture handout provided on food demonstrations and recipes. • Farm markets held at the community dining site with a nutritionist on site to answer questions. • Activities include farm market - grab and go with handouts in bag. • Other activities include food demonstrations and newsletters that go out quarterly, covers topics around health issues, games like crossword usually nutrition based. • Online cooking classes records between 40-80 people with a ***popular chef*** while other online cooking demos and cooking classes reach an average of 35 people. • In person records an average of 25-35 people. The newsletters reach about 100 people.	**<u>Location of Program</u>** • Ward 3
Participant #4 <u>School garden support programs</u> • Focuses on creating positive connection for students to healthy delicious foods, nature, each other, and to community members to increase the support network needed every day. • School garden support level is about increasing joy and enjoyment of healthy food and for spending time outside and engaging learner in different ways through hands on experiential learning. • Nutrition education happens through hands on garden-based education with partner schools. Works with partner schools essentially to increase the number of schools using their school garden as a teaching tool and food is often the most engaging form of education. • A 4 -8-week series about STEM and nutrition is thought. Involves outdoor learning and hands on learning including going out and planting seeds, making recipes, cooking, and tasting opportunities primarily for elementary school students and occasionally offer family events, cook nights. • Pre COVID, 2000 students were served over a year through the nutrition education programs directly. • During COVID, about 100 – 200 nutrition education lessons were provided. Pre COVID that number was close to 700 or 800 lessons serving 2000 students.	• Pre-K through third grade. • Sometimes 4th and 5th grade, middle school, lower elementary audience. • The target audience is exclusively Title 1. • Predominantly very high need schools in Wards 5 and 7, 8 and 4. • Ethnicity of the population is predominantly black and African American. • Some of the schools are over 90% at risk students. • Very high in SNAP ED eligibility amongst the family population.

• Each of the lessons are 45 minutes or longer and 4 – 8 weeks series. Direct education is provided through the garden science code teaching model. • Typically, 15 – 20 students in a class. In a month around 100 students through direct education. This is the school champion model or nutrition education champion model. • District statistics shows that one in four teachers leave every year at the highest needs schools. Consequently, relying on school champion or nutrition education champion model is not sustainable. Oftentimes, garden will get built and the champion leaves, then the garden falls apart. • Program model changed a bit during COVID. New program model involves providing support for schools to deliver their own direct education. It is the educator coaching program. Approach is such that teachers and schools come to as a team to receive nutrition education training. • Program works with a team of teachers from a school, and train them through summer professional development called summer institute for garden based available for anyone in the District and focuses on school garden maintenance, sustainability, outdoor learning, how to cook with kids and how to think of framework for lessons. In addition, providing curriculum to the team and the organizations while connecting them to the school garden community and providing technical support including writing first grant application.	**Location of Program** • Most of the programming happen in Ward 5, some in 7 and 8.
Participant #5 Youth Garden education • Urban garden education administered and facilitated in schools east of the river youth development sites. • Focuses on meeting people where they are and basically programming youth programs. • Program sites include YMCA like National Junior Baseball Academy, Faith-based institutions, and DC Housing Authority sites. • Programmers build gardens, run classes, summer programming, and partnerships with summer camps.	• Ethnicity of majority of the population targeted is African American. **Location of Program** • Wards 7 and 8 and 5

• Unique partnerships with the DC department of Parks and Recreation. Camps come to urban farm called the lateral center where kids get to see the beehive, the greenhouse, get to plant and water the soil. • Activities include a 3-hour experience with about 30-40 kids, where instructors skilled in urban farming and gardening engage kids. Typically, an average of 100 kids daily for about 5 weeks consistently. • Other activities include hands on learning experience that last anywhere from 45 minutes to an hour or an all-day gardening workshop. Often, partnership is with sites where they have gardens and connecting with the community, sports team, seniors, and stakeholders in the community. • Usually the classes are between 20 – 30 kids depending on the public housing sites where summer programming of the classes is happening. Classes for the kids run for 30 minutes per group twice a week. • Outdoor classroom exists with 20 raised bed gardens. • Nutrition classes are provided for youth and their families. • The program includes intergenerational programs where kids and adults or families are out at the urban farms learning the basics of being able to grow their own food, harvest it, and prepare it, in addition, cook it and sell it. • Program provides value-added products and entrepreneurship opportunity for the people.	
Participant #6 <u>Healthy Schools, Healthy Communities</u> • Program works on several different grant funded projects that are focused on policy, systems and environmental changes that support healthier lifestyles, where people live, learn, work, play, worship, and even shop depending on the project. • The grant for nutrition education may be the entire focus of the work. • For instance, program includes work in a school-based setting and support to teachers with various curricula incorporated into their classrooms and build nutrition concepts into the lessons.	• Underserved communities and neighborhoods. **<u>Location of Program</u>** • Covers the entire district.

• Healthy schoolhouse is a project that is currently running and on for a couple of years through the USDA NIFA funded project. • Partnering with DC Central Kitchen for opportunities for nutrition education in the cafeteria environment. • Opportunities sought in the cafeteria to encourage and enhance food service professionals to be part of the learning environment. • Organization has run several projects over the years.	
Participant #7 <u>Early Childhood Centers</u> • Program provides services for supporting families. • Program may be grant based. • The root curriculum specifically early childcare center focused curriculum is developed based on available evidence-based resources. • Activities include workshops and trainings for teachers, family engagement events, nutrition education classes with topics and handouts that cover health and wellbeing, child and adult food care program and picky eating. • Family engagement events have 30-40 families in attendance and bags of fresh ingredients are provided for about 20 families. • Other activities directly with children include hands on experiential learning incorporating local foods, food tasting, development of culturally relevant recipes, and age-based seasonal relevant nutrition education topics for the target audience. • Core activities for the program falls under three categories – family engagement, teacher trainings, and staff trainings. • Family engagement lessons are about 30 - 60 minutes, teacher trainings; about 30 – 45 minutes for at least three times a year. • Program delivery of nutrition education lessons could be directly via program staff or indirectly via trained teachers. • Number of lessons provided is directly a function of the funding received that fiscal year.	• Predominantly, low-income communities **<u>Location of Program</u>** • Columbia Heights D.C.; Stevens. • Zip codes 20009, 20011, 20036.

• Program is grant based, to finance material resources, and ingredients. Funding sources may be private or public. • Runs Community Supported Agriculture (CSA) program. • Target audience are primarily, low-income communities. A major barrier some participants in this target population encounter is difficulty attending nutrition education program due to tight work schedule from working multiple jobs.	
Participant #8 <u>Early Growers Program, School Garden Partner Program, Youth Entrepreneurship Cooperative Program, Community Green Spaces Program and Resources and Trainings</u> • Programs focuses on bringing people into garden spaces, working with volunteers, supporting program partners with maintenance and growth of garden spaces each season, and providing trainings on nutrition education. • Utilizes a holistic approach to nutrition education, incorporating, play, art, recipe making and connections through growing food. <u>Early Growers Program</u> • Focuses on creating those first relationships and interactions with nature. • Partners with Early Childhood Centers across the District. • Partnership with about seventeen (17) centers. • Program's goal is to provide coaching sessions that give educators the skills and knowledge base required to incorporate garden and nature-based education into classroom curriculum. • Topics cover recipe making, which is basically bringing garden science and art into food and nutrition connections to literacy. • Program comprises coaching and co-teaching components. • Other activities include building green spaces for outdoor space for Partner sites. • In addition, mini field trip-excursions to community green spaces.	• Ages 2 -19 years • Young children and youth • Intergenerational (children and families) **<u>Location of Programs</u>** • Wards 1, 4, 5, 6, ,7 and 8.

School Garden Partner Program • Program facilitates coaching for teachers and school staff, supports co-design of school green spaces. • Incorporates co- teaching with teachers in delivery of garden-based lessons within schools. Youth Entrepreneurship Cooperative Program • Program works primarily with two high schools, but now open to high schoolers across the District. High schoolers developed their own business – Mighty Greens which focuses on food access and making connections with communities. Activities include growing seedlings, distribution, and sale of produce. Money made from sale of fresh produce is redistributed to youth who have participated in the activities. • Other activities include production of value-added products such as teas, body scrubs and herb salts. In addition, farmers' markets, recipe making and nutrition education. • Program runs like a staff- CSA for teachers at their schools, individuals, and community, and creating connections through fresh produce brought into school community during summer. Community Green Spaces Program • Program has about five community green spaces primarily focused on kids, and intergenerational programming, with open drop-in hours at green spaces. • Activities include field trips, harvesting, recipe making, cooking at picnic tables from produce grown and harvested at green spaces. Other activities include independent play, and exploration for kids. Resources and Trainings • Goal is to create resources that support people and communities to reproduce program model.	

• Resources are created from program activities done with collaborating with kids across DC. • Resources include bilingual cookbook for sale, writing of grants to distribute to schools across the city and nationally. • Early childhood curriculum focuses on incorporating science, literacy, art, and recipe making into early childhood centers. • Trainings are facilitated for educators.	
Participant #9 <u>Food Prints</u> • Food Prints Program in Partnership with DC Public Schools (DCPS). • Program currently working with 19 DCPS and early childcare education centers. • Food Print provides staff for partnership schools to work at the school. • Program staff ensures school has a thriving vegetable garden and provides experiential learning for the students. • Program staff incorporates classroom teachers and parents whenever possible. Program teachers run classes and ensure feasibility of program in the school. • Curriculum started in 2009 and was designed to support academic program at each of the grade levels, primarily preschool through 5th grade and to integrate food and nutrition into science focused education. Curriculum is made up of a set of 9 lessons at each grade level. • Specific lessons in food prints curriculum goes beyond traditional nutrition education lessons. The model is Grow, Cook, Eat, Learn. • The approach of Food Prints curriculum, follows a more effective way of nutrition education in providing kids with positive experiences, growing, cooking, and eating nutritious vegetables, fruits, and whole grains. • Programming also extends to families which includes cooking and gardening lessons. • Program staff work with early childcare education centers to support teachers in provision of food education for young children and incorporating more fresh produce into their meal program at the centers. • About 77,400 students involved in Food Prints Program in 20 DC Public schools.	• Age 3 year through 12-year-old 5th graders. • Students are predominantly African American • 75% of students considered at risk **<u>Location of Program</u>** • Food Print Program takes place in schools across the city.

Participant #10 Healthy Living Program • Focuses on community outreach and education, coordinates food as medicine programming, produces prescription programs and supports healthy living initiatives with merchandising teams. • Programming has been virtually since pandemic and reaches all residents in DC. • Program covers personal consultations, individual consultations, and family consultations online. • Program offers in person, virtual classes, and store tours. Classes address clinical issues like diabetes and prediabetes or heart health or food allergies or gluten intolerance. • Classes could focus on non-clinical topics like Mediterranean made easy, meal solutions, eating on a budget, and seven steps to healthier eating. • Other classes include 'kids focused class' called delicious discoveries and that is a food science class for kids. In addition, classes related to fitness – referred to as 'try something new' every Saturday morning 9 am. Note that classes change seasonally. • Monthly activities include cooking classes with a registered dietitian, classes offered in partnership with healthcare organizations. Weight management 6 weeks - series called way to go WEIGH. • Curriculum adapted is MyPlate, Academy of Nutrition and Dietetics guidelines and USDA guidelines.	• All residents in DC **Location of Program** • Programming virtually since COVID covers entire DC.
Participant #11 Simple Cooking with the Heart (American Heart Association) • Program serves SNAP ED eligible individuals across the district. • Team of educators deliver nutrition education classes and implementation. • Teaching kitchen situated at different program sites -Anthony Bowen, National Youth Baseball Academy in Ward 7.	• All residents in DC. • Children, young mothers - mostly under age 30 years, older black women (depends on partnership organization).

• Curriculum used is the American Heart Association adapted for target population. A 10-week evidence-based curriculum evaluated by Dr. Julia Wolfson. Curriculum has culinary component, nutrition component (basic nutrition education) and cooking. • The focus of the American Heart Association curriculum is reducing salt, fat, and sugar. The strategies utilized include replacing salt in recipes with bold flavors like fresh herbs and spices. • Classes have two levels, and each level is four weeks. Each lesson contains a brief nutrition component, culinary component, and cooking classes. In person is hands on experiential learning; virtually, instructor cooks through entire meal live and participants cook along depending on preference. • Learning activities include learning knife skills, portion size control, lessons on protein, whole grains, and seafood. • Program philosophy is hands on and creating a fun environment, integrating cooking as hands on and nutritional information. • Two or three classes run weekly in monthly series; classes are about 90 minutes. • Strategic partnership with organizations serving SNAP eligible individuals. Demographics of program participants depends on partnerships. • Partnership Organizations includes FLIP, Senior Center, WIC clinics.	**Location of Program(s)** • Programming virtually since COVID covers entire DC. • Wards 4, 5, 7 and 8.
Participant #12 Food Bank, Gardening Program • Program includes nutrition education and gardening. A wellness tracker is in place and categorizes each food item based on a wellness criterion, food safety within organization and outside the organization. • Programming focuses on partners who contract with the organization to receive food at no cost. Goal is to help partners utilize the food received adequately to reduce food waste and encourage healthy behaviors. • Program focuses on working with over 400 partners to provide education and guidance on ways to create healthy pantries for the people they serve. • Activities include workshops on creating healthy pantries, food budgeting workshops for education on food budgeting, classes on cooking, and food demos with partners on specific foods being distributed. Workshops run between one to two hours depending on the activities.	• Ethnicity of target audience include Blacks and African American, Hispanics, Caucasians, Asian. Majority is Black and African American. **Location of Programs** • Located in north, Northeast DC on Puerto Rico Ave.

• Education is delivered remotely, recorded or a video presentation because of the pandemic. • Previously, the classes were delivered in series, presently, a single class is delivered. • Surveys are conducted at the end of classes to assess what was learnt. After six months of working with a particular partner, survey is conducted again to assess self-efficacy and motivation of partner. • Gardening program focuses on working with schools through workshops and exposure of kids to learn how to grow their own food in low-income areas. • Over 60 workshops and classes conducted in one year. Curriculum used is MyPlate.	
Participant #13 <u>Senior Center</u> • Approach to nutrition education with this population basically involves repetition and reinforcement of nutrition information, seniors are likely to forget information communicated. • Program works with seniors from different countries and cultural backgrounds including South-Central America, South America, Americans. • Two classes are held daily. Activities include recipe making, cooking demonstrations and nutrition education on selected relevant topics like high cholesterol management, high blood pressure management, diabetes management, Osteoporosis prevention, portion size control, and food label reading. • Pre pandemic, average number in classes was 50 – 60 seniors, now classes are virtual, and attendance is around 10-15 seniors per class. Length of classes are about 60 minutes, typically 45 minutes for lessons and 15 minutes for question and answer. • Pre and Post-test, although time consuming for this population, it is conducted to assess what has been learnt. • Curriculum used include SNAP ED and MyPlate.	• Seniors aged 60 years and above. • Ethnical background of target audience from countries like Mexico, Brazil, Guatemala, Bolivia, Colombia, Dominican Republic, and Cuba El Salvador Nicaragua disdain. • Americans (South and Central America). **<u>Location of Program</u>** • 1842 Calvert St NW, DC 20009.

Participant #14 Health and Wellness Program • Program's goal aligns with the organization's vision which is healthy Mamas, healthy babies, and healthy communities. • Focus of the program is health and wellness for mothers (rising program). Modality is in home visitation, perinatal and post-partum health, and wellness education for clients. • Program's education, classes, and curriculum are well developed. Programmer strives to maintain relationship with partners in areas related to food insecurity and food access. • Program utilizes holistic approach to education incorporating spiritual wellness, physical, emotional, environmental, social, occupational, intellectual and nutrition education. • Three categories of classes; first is the individual health and wellness prenatal assessment and nutrition education as it relates to pregnancy requirement, through postpartum lactation and breast feeding if clients choose to breastfeed and if they don't, they are educated on proper nutrition, infant health and toddler feeding. • Second category is the small group classes that are community based of up to five clients per class, divided into nine different subcategories. Clients enroll in these classes during their duration in the program. • Some topics covered in these small group classes include prenatal wellness basics, blood sugar basics, healthy food-fluid balance, and blood pressure associated conditions such as preeclampsia, hypertension, gestational hypertension etc. • A very important class called Formula for Healthy meals. This class breaks down the information from USDA choose MyPlate, shows clients how to combine foods with appropriate portion sizes. A creative idea for snacks is 'remixed the Junk' healthy snack ideas for clients that live in food insecure areas, where foods are creatively combined in a manner that is healthy. The clients are shown how to combine and create snacks and small meals that are healthy. Also, though not necessarily related to nutrition education, there is a class offered on substance use and smoking cessation. Tobacco smoke and marijuana use and other forms of substance use and effect on micronutrients are addressed in the class. • The third and final kind of class is the semi-monthly community-based nutrition education class that provides an opportunity for clients to have hands on experiential	• Females of reproductive age, pregnant women, and breast-feeding mothers. **Location of Program** Wards 6, 7 and 8

learning. The class focuses on meeting basic nutrition needs for pregnancy, postpartum nutrition, health during lactation and family wellness. Other classes focus on nutrition, wellness and financial literacy workshops which help provide clients with resources and guidance on meal planning, food shopping on a budget, financial planning for food, shopping, and navigation of food benefits (a lot of clients served are recipients of federal food programs).	

Research question #3: How do programs measure their impact and what are the results?

Below is an analysis of key informant interviews for research question three with examples of unaltered quotes from participants of the interviews. The following themes emerged to address how organizations measure the impact of their programs:

I. Anecdotal feedback received from program participants as a measure of program impact.

During the interviews with key informants, majority of the key informants mentioned that feedback from their participant was key in gauging the impact of the program. For example, **Participant #3** expressed this clearly with the quote: ***"We kind of just gauge the feedback we receive, you know, if we get a lot of feedback, say from the dining site manager saying the participants loved the kale salad he made and they never had, you know they wouldn't normally have eaten it this way, but this was so easy and tasty"***

Similarly, **Participant #9** expressed that the impact of their program was measured by the tons of positive feedbacks they received from families of students enrolled in their programs with the quote: ***"We have tons of anecdotal feedback from families saying that they use the recipes and it's changed what they eat at home, and they incorporated things that they weren't eating before. We also have sort of an evaluator that we work with on a regular basis, and I'd be happy to share more of her reports, but just that schools and students really value the program and that it's having an impact on what they're choosing to eat"***

Furthermore, interview **Participant #7** shared information on anecdotal feedback received from program participant however, in this case, the feedback was elicited by probing participant to gain further clarity on the education they had provided and is expressed in this

quote: ***"…..mostly verbal feedback like 'I don't know how to prepare this, I would like to learn more about this, or I have a picky eater at home' So, it really depends on the feedback that that we ask during the workshop or during the week in conversations that we have with families and usually they fill out a survey at the end of the year with family engagement"*** Therefore, qualitative assessment of key informant interviews showed that anecdotal feedback is a measure for evaluating impact of the program.

II. The use of control and Intervention studies and feedback evaluation form.

During the interviews, two of the participants expressed that their organizations conducted intervention studies and, in other cases, both control and intervention studies are used to evaluate the impact of the program. For example, **Participant #6** explained how they were conducting studies to evaluate program effectiveness using two schools for the intervention and two schools for control with the quote: ***"I was just discussing; we have two intervention schools and two control schools in Ward seven and eight where we're working with teachers and providing professional learning opportunities so that they get familiar with the USDA's MyPlate, a yummy curriculum"***

Similarly, **Participant #9** elaborated on the use of studies as a measure of program impact, however in this case, an intervention study was used. The quote reads: ***"We think it's very effective and we have a lot of evaluation to back that up so one of the more interesting ones that we've done recently is we did a study where we had been collaborating with the school meals program and, we had a chef coach in the lunchroom who was helping to cook from scratch one day a week at ten of our schools cooking those exact same recipes in their food, friends, classrooms, and eating it together so they came into the lunch program familiar with those specific things that were offered on the menu, and we***

compared how much kids were eating in the lunchroom at schools we partnered with. Two of those same foods were served at schools that didn't have the program, the kids at our partner schools were eating 42% more of the whole grains, fruits and vegetables that were served in the school meals program" In addition, with regards to measurement of program impact and result, **Participant #6** stated that feedback form was also a measure used for evaluation: ***"Whenever a teacher teaches a lesson, there is like a 'I taught this lesson form' that we asked them to fill out and give feedback on how the lesson was. How did your students respond? What would you change? What did you like? And for the most part, it's all largely positive feedback"***

Consequently, key informant interviews revealed that some organizations used intervention, control studies and feedback form to measure impact of the programs offered.

III. A yardstick for evaluation of program impact is the right professionals providing education.

During the key informant interviews, **Participant #10** expressed that a criterion for measuring the impact and results of their nutrition education was having the right professionals for the job provide education with the quote: ***"Our education is very effective and the reason why I say that is because it's being delivered by the right people. They are credentialed professionals, but also because it's very practical information that focus on what to put in your cart and what to put on your plate for better health"***

In addition, **Participant #12,** a credentialed professional; Registered Dietitian Nutritionist (RDN) and Head of Nutrition Education in an organization described her responsibilities for nutrition education in the organization with the quote: ***"I oversee all our nutrition education, programming, and our gardening program. I also oversee any dietetics related issues. For***

example, we have a wellness tracker where we categorize each of our food items based on a wellness criterion. I'm responsible for establishing health and nutrition criteria and policy for the organization and making sure that it's being implemented correctly and effectively"

For these reasons, some interview participants expressed that having the right professionals for the job was an indication and measure for program impact.

IV. Knowledge Attitude and Practices (KAP) a measure of program impact.

During the interviews, key informants expressed that exposure to new food ingredients, learning new information and trying/tasting new foods previously never tried are measures for evaluating impact of the program. For example, **Participant #2** explained with the quote that although they did see behavior changes in terms of trying new foods, they did not follow up to measure the impact:

"***We definitely can see students like try new things and we hear from parents' comments like oh, they never eat vegetables at home and things like that. So, I think we are effective in creating a fun exposure environment for trying new foods. But as far as like how much of the nutrition information they retain, the facts about it, we haven't really done like follow up testing or anything like that"***

Furthermore, **Participant #1** listed three metrics for measuring impact of the program and results which included exposure to new food ingredients, learn new information and try/taste new foods with the quote: ***"……. Like did we teach them something that they did not prior know? also are we exposing them to a new food ingredient? or food item that they hadn't tried before? So, ultimately that for me, was also a measure of effectiveness like we also***

exposed you to something new that you hadn't tasted before. I would say those three things would be examples of how I would measure if a lesson was effective or not"

As a consequence, these examples cited with the unaltered words of key interview participants show that knowledge gained, attitude developed and new practices incorporated in lifestyle are measures to evaluate program impact.

V. Clear standards for formative and summative evaluation process vital to measure impact.

The key informant interviews revealed that organizations measured the impact of their programs, however, majority of the organizations lacked a systematic method of evaluating the impact of programs. For example**, Participant #4** expressed that their organization was in the middle of redoing their evaluation tools and getting technical support from SNAP ED with the quote***: "We've been working on and are in the middle of redoing, sort of our evaluation plans this year and working on an evaluation plan for our curriculum. So, in the past, we have done surveys directly with students which as you can imagine is hard with pre-K students and so oftentimes, we've relied just on teacher data. So, what we're trying to do this year is figure out how we integrate teacher data and data from direct work with students in ways that's reflective of the age of the population, that we're working with. We're working right now on creating evaluation tools through our work with SNAP ED. I'm appreciative to the SNAP ED DC team. They've been working on helping us figure out direct education evaluation tools. The restructuring that SNAP ED has done around their state plan for evaluation has helped us understand a little bit more that we can use some of these tools that we already had to collect the data to show evidence. So, what I'd say is that***

some of this, is a work in progress for us to get real data"

Furthermore, decisions by some of the organizations were based on observations of behavior change or self-reports from the target groups or partner organizations. For example, **Participant #5** described the impact of their program was based on partners willingness to continue working together to implement programs, and completion rates of the program. In addition, the participant explained the reasons for indicating positive outcome of the program with the quote below: ***"Besides the general metrics of satisfaction or just people completing our classes, I think one of the ways that we measure satisfaction is through our partners who we work through long-term relationships and great relationship with our partners, and we continue to build on that, and I think we do that by just providing great service. And I think that if we are not doing what we are doing good, then they will not want to work with us"***

Table 4 is a summary of the themes in response to research question three.

Table 4: Summary of themes in response to research question number three: How do programs measure their impact and what are the results?

- Anecdotal feedback received from program participants as a measure of program impact.
- The use of control and Intervention studies and feedback evaluation form.
- A yardstick for evaluation of program impact is the right professionals providing education.
- Knowledge Attitude and Practices (KAP) is a measure of impact of the program.
- Clear standards for formative and summative evaluation process vital to measure impact.

- Organizations need to develop, have clear standards to conduct a formative and summative evaluation process to effectively evaluate impact of the nutrition education program and results.

2.3 Results of the nutrition educators survey on Qualtrics

The nutrition educators survey on Qualtrics developed from the key informant interviews, addressed the five research questions of interest to the DC Food Policy Council outlined earlier in section 2.2. This section presents a descriptive analysis and interpretation of each survey question.

Section I – Introduction

Organizations run by the Government include Federal, State, and Local Government administered organizations.

1. Is the organization you work for run by the government?

Organization's responses	Action	# Of Organizations	%
Yes	Exit	4	4.71
No	Proceed with survey	81	95.29
Total		85	100

Of the eighty-five (85) organizations that started the survey four (4) were not eligible and did not proceed with the survey. Eighty-one (81) organizations were eligible and participated in the survey.

2. What is the name of the non-governmental organization you provide nutrition education for and indicate your organization's zip code where nutrition education is provided.

Of the eighty-one (81) respondents that participated in the survey, twenty-nine (28) organizations did not report their name and zip code.

1. Giant Food – all zip codes in DC
2. D.C. Central Kitchen all Wards except 2 and 3
3. Seabury Resources for Aging – 20001, 20002, 20010, 20011, 20017, 20018, 20064, 20317, 200390, 20024, 20319.
4. Nutrition Unlocked – 22203
5. Growing SOUL – Online (virtual available to all D.C. residents.
6. FoodCorps
7. D.C. Central Kitchen – 20019, 20020, 20593, 20003, 20002.

8. Psychiatric Institute of Washington, 4228 Wisconsin Avenue, Washington, D.C. 20016
9. Cancer Support Community
10. Medstar Georgetown University Hospital
12. Medstar Georgetown University Hospital Division of Community Pediatrics; Zip codes - 20001, 20002, 20003, 20019, 20020, 20032.
13. Mary Center 20011, 20009
14. Bridge Integrative Health and Nutrition, LLC – 20019
15. Food remedies – 20008
16. Cancer Support Community, Online & in Wards 7 & 8 via a patient navigator.
17. Giant Food, 21230, 21244, 21286.
18. Friends of the National Arboretum.
19. North Capitol Collaborative Inc. 20020
20. Summit Health Institute for Research and Education, Inc.
21. Common Threads 20001, 20002, 20003, 20008, 20009, 20010, 20011, 20017, 20018, 20019, 20020, 20032, 20036.
22. Arcadia's mobile market 20032, 20019, 20001, 20020, 20017
23. All 8 wards in DC through a USDA Specialty Crop Block Grand awarded to UDC
24. Hattie Holmes Senior Wellness Center, 20011.
25. SWOP Behind Bars.
26. Giant Food – All of DMV and Delaware
27. Five Loaves & Two Fish Healthy Teaching Kitchen
28. Cancer Support Community Washington D.C. – 20001, 20020.
29. Mamatoto Village
30. Siloam
31. SOME Senior Services
32. City Blossoms 20011
33. Love & Carrots – 20008.
34. Washington Parks & People 20019.
35. The Green Scheme - 20018.
36. Iona - 20016.
37. YMCA of Metropolitan Washington (Based out of 20009 but provide virtual education citywide).
38. Anonymous
39. Anonymous.
40. Common Good City Farm, 2000
41. Food & Friends, several zip codes in D.C.
42. Howard University Hospital Washington D.C. – 24060.
43. Friends of the National Arboretum (Washington Youth Garden) 20002.
44. Fresh Farms 20001.
45. Giant Food, 20785.
46. American University 20016.
47. Food prints
48. Centro Nia 20009, 20912.
49. Martha's Table.
50. D.C. Green - 20002
51. Common Good City Farm.

52. City Blossom.
53. Sharon dale Mushroom Farm – 20019, 20020, 20032, 20003, 20011, 20009, 20037, 20002, 20018, 20024.

A **Nutrition Education Program (NEP)** delivers evidence-based nutrition education that helps the audience make healthier choices. Example of types of NEPs are School-based nutrition education, Garden-based nutrition education and Diabetes nutrition education etc.

3. How many different types of nutrition education program(s) does your organization provide?

Number of different types of NEPs	**# Of Organizations**	**%**
1-2	32	54.24
3-4	18	30.51
5+	9	15.25
Total	59	100%

Fifty-four percent (54%) of the organizations that responded to the question had 1-2 different types of nutrition education program(s), thirty-one percent (31%) had 3-4 organizations and fifteen percent (15%) had more than five (5+) types of nutrition education programs.

Section II – Nutrition Educators

Number of nutrition educators	**# Of Organizations**	**%**
1-2	16	25.40
3-4	15	23.81
5-7	5	7.94
8+	22	34.92
None (*External nutrition contractors)	5	7.94
Total	63	100

*External nutrition contractor – Contractors; race dependent on who is contracted; all races we serve black and brown community; Asian.

Majority (35%) of the organizations that responded to the question had more than eight (8+) nutrition educators providing nutrition education. Twenty-five percent (25%) had 1-2 nutrition educators, 23% had 3-4; and 8% had 5-7 nutrition educators in the organization. Some organizations contracted the services of nutrition education provided in the organization to external contractors (8%).

5. Which of the following options best describes the person(s) that provide nutrition education in your organization.

Person(s) delivering nutrition education	**# Of Organizations**	**%**
Culinary instructors	14	15.73
Licensed nutritionists	14	15.73
Registered dietitians	27	30.34
Other (non-nutrition professionals)	34	38.20
Total	89	100

Analysis of the responses showed that nutrition education was delivered by registered dietitians (30%), licensed nutritionists (16%), culinary instructors (16%), and in some cases non nutrition professionals (38%) provided the education. Note: Some of organizations had more than one person delivering nutrition education.

6. What is the race of nutrition educator(s) in your organization? Check all that apply.

Race of nutrition educators	**# Of Organizations**	**%**
White	43	30.94
Black or African American	46	33.09
American Indian or Alaska Native	4	2.88
Native Hawaiian or Pacific Islander	4	2.88
Hispanic/Latino	15	10.79
Asian	16	11.5
Other-	11	7.91
Total	139	100

Analysis of the survey responses revealed that most nutrition educators are African American (33%) and White (31%). Other races include Hispanic/Latino (11%) and Asian (12%), African Indian or Alaska Native (3%) and Native Hawaiian or Pacific Islander (3%).

7. What is the gender of the nutrition educator(s) in your organization? Check all that apply.

Gender of nutrition educators	**# Of Organizations**	**%**
Male	28	27.72
Female	56	55.45
Non-binary/third gender	15	14.85
Prefer not to say	2	1.98
Total	101	100

The survey responses revealed that majority of the nutrition educators were female (55%) and male educators make up 28%. Fifteen percent (15%) identified as non-binary/third gender.

8. What is the credential(s) of nutrition educator(s) in your organization? Check all that apply.

Credential of nutrition educators	**# Of Organizations**	**%**
CHES – Certified Health Education Specialist	4	4.49
MD – Doctor of Medicine	1	1.12
MPH – Master of Public Health	13	14.61
RD – Registered Dietitian	27	30.34
LN – Licensed Nutritionists	17	19.10
RN- Registered Nurse	1	1.12
*Other(s) responses	26	29.21
Total	89	100

*Other – CDCES, CSOWM, CLC, CSSD, MS – Nutrition, MS, CNSC, Certified Nutrition Specialist.

Of the organizations that responded, thirty percent (30%) were registered dietitians, 19% were licensed nutritionists. Fifteen percent (15%) had a Master's in Public Health and twenty nine

percent (29%) fell in the other category: certified as nutrition specialist, had MS - nutrition, MS, CNSC, CDES, CSOWM, CLC and CSSD certification.

9. Which of the following types of nutrition education delivery does your organization provide? Check all that apply.

Nutrition education delivery Type	**# Of Organizations**	**%**
Indirect education through partnerships to participants	27	16.88
In- person (Face -to-Face) – Direct	53	33.13
Virtual and Online Learning	47	29.38
Use of technology such as email, texting, social media etc.	26	16.25
None of these	0	0
Not sure	1	0.63
*Other(s) responses	6	3.75
Total	160	100

*Other – Flyers/receipt cards; Blogging/Newsletters; Delivery of food and nutritional literature; Service learning; Podcast, Blog, in-store magazine, TV media.

Most of the organizations provided education directly in-person (33%) and virtually/online learning (29%). A significant proportion of the organizations provided the education indirectly through partnerships to participants (17%). In addition, organizations (16%) used technology to share nutrition education messages. Other (4%) types of channels through which organizations provided education included the use of flyers/receipt cards, blogging/newsletters, delivery of food and nutritional literature, service learning, podcast, blog, in-store magazine, and TV media.

10. Which of the following audiences does your organization target for nutrition education? Check all that apply.

Audiences targeted for nutrition education	**# Of Organizations**	**%**
Anyone interested	16	31.37
Children 0-3 years	3	5.88
Children 4 -10 years	4	7.84
Young Adults 11 – 17 years	1	1.96
Adults 18 -64 years	5	9.80
Pregnant women only	0	0
Pregnant teens 12 – 17 years	0	0
Pregnant adults	1	1.96
Adults with Diabetes	0	0
Adults with Obesity	2	3.92
Seniors 65+ with chronic disease (s)	3	5.88
Seniors 65+ without chronic disease (s)	1	1.96
Mixed participants	15	29.41
Not sure	0	0.00
Total	51	100

Most of the organizations targeted anyone interested in the nutrition education (31%); twenty-nine 29% of organizations targeted mixed participants. Other organizations provided education for specific populations or age groups. For instance, 6% of the organizations targeted seniors with chronic disease, 2% targeted seniors without chronic disease while 4% targeted adults with obesity.

Figure 1 below is data extracted from the table above and it shows the 51 respondents % distribution of organizations' that targeted audiences with special needs: seniors, pregnant adults and pregnant teens.

Figure 1: Distribution of organizations that targeted audiences with special needs: Seniors, Pregnant adults and Pregnant Teens

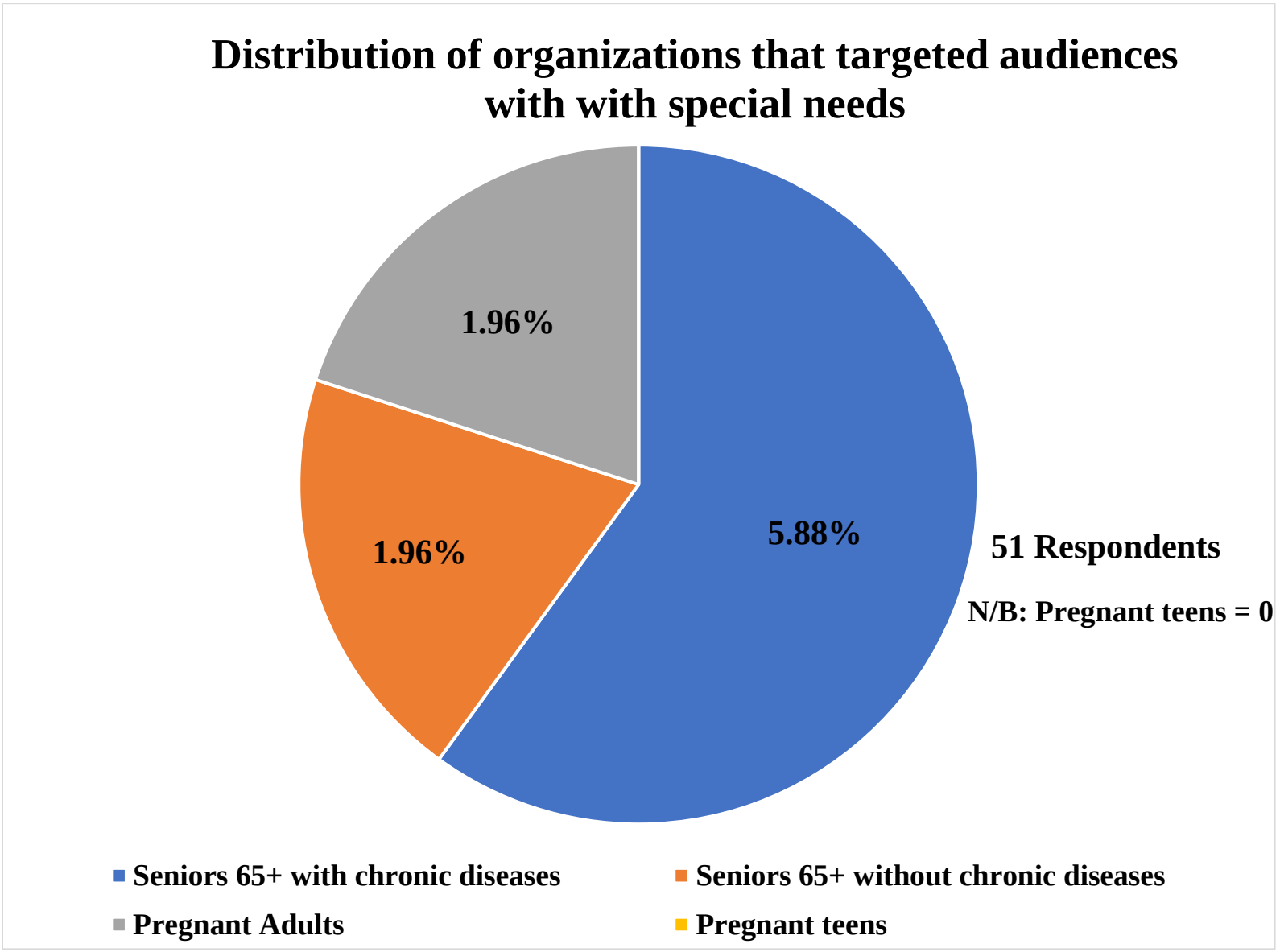


Figure 1 shows data extracted from the table above and it shows the 51 respondents % distribution of organizations' that targeted audiences with special needs: seniors, pregnant adults and pregnant teens.

11. Approximately, how many participants do you teach in a 12-month programmatic year by age? Check all that apply.

Total participants	0-50 Pre-Pandemic	0-50 Pandemic	50-100 Pre-Pandemic	50-100 Pandemic	100-200 Pre-Pandemic	100-200 Pandemic	200 and above pre	200 Pandemic
Children 0-3	9	6	2	5	2	2	1	0
Children 4-10 years	9	8	0	8	1	5	4	7
Young adults 11-17 years	5	10	3	2	2	5	1	5
Pregnant Teens 12 - 17 years	3	6	1	1	0	1	0	0
Pregnant Adults 18 - 55 years	3	3	1	1	0	3	0	1
Adults 18 - 64 years	4	6	2	5	2	6	4	7
Adults with Diabetes 18 – 64 years	0	4	3	2	0	2	1	3
Adults with Obesity 18 – 64 years	1	6	3	3	1	4	0	3
Seniors with chronic disease 65+	3	6	1	5	2	1	0	3
Seniors 65+ without	2	5	2	3	0	1	2	2

chronic disease								

Descriptive analysis of the survey showed that twenty-three percent (23%) of respondents indicated programming for infants and young children (0-3 years) pre -pandemic and reported fifty or less participants (0-50). However, during the pandemic 13% provided education for this population. Respondents reported Pre-pandemic programming for seniors, was thirteen percent (13%) with 0-50 participants recorded fifty or less (0 -50) participants while 18% were programming during pandemic.

12. Check all location sites that apply to your nutrition education program(s)

Nutrition education program(s) location and sites	**# Of Organizations**	**%**
Early Children sites	13	6.70
Individual private homes	3	1.55
Group living arrangements	2	1.03
Community and recreation centers/parks	18	9.28
Urban farms	10	15.5
Schools and School-based gardens	25	12.89
Libraries	5	2.58
Health care clinics	12	6.19
Faith-based centers/place of worship	10	5.15
Grocery/corner stores	9	4.64
WIC clinics	4	2.06
Emergency shelters and temporary housing sites	3	1.55
Farmer's markets	13	6.70
Food assistance sites	7	3.61
Food banks	6	3.09
Food pantries	11	5.67
Online	23	11.86
Senior centers	14	7.22
Other	6	3.09
Total	194	100

Analysis of the survey responses showed that majority of the organization's location were in school-based sites (13%), urban farms (16%), community and recreation center/parks was 9%. In addition, with regards to program locations, 12% of the organization were online, 9% were food banks/pantries. Other locations or sites for programming reported were Early Children sites (7%), Farmers' market (7%), Senior centers (7%), Health care clinics (6%), Faith-based centers (5%) and Grocery/corner stores (5%).

Figure 2: Distribution of organizations by nutrition education program sites

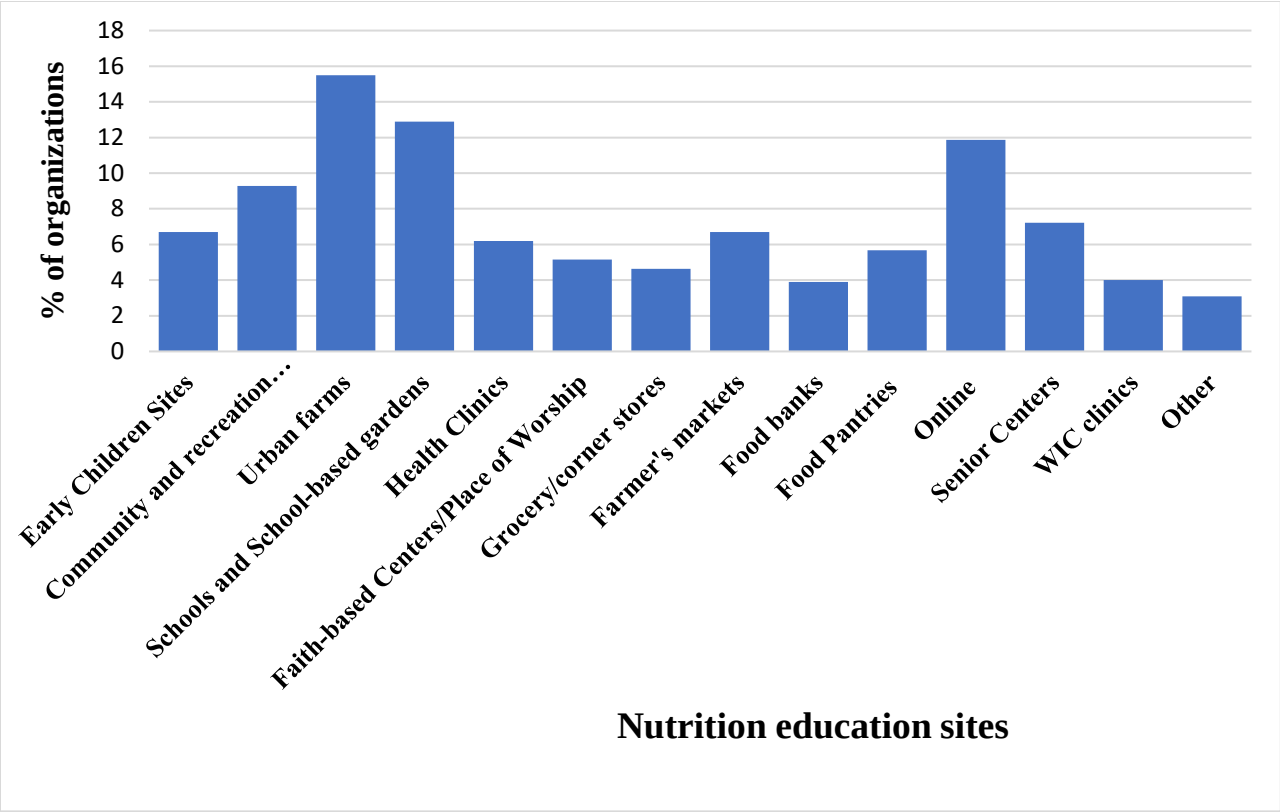


Figure 2 shows the Percentage (%) distribution of the nutrition education program sites. Note: that organizations overlapped with program location and sites.

13. How many location sites does your organization have for all nutrition education program(s).

Number of nutrition education location (sites)	# Of Organizations	%
1-2	23	44.23
3-4	7	13.46
5-7	2	3.85
8+	20	28.46
Total	52	100

Analysis of the survey responses revealed that majority of the organizations had 1-2 location sites (44%) and twenty eight percent (28%) had more than eight (8+) location sites. Thirteen percent (13%) had 3-4 location sites, and less than 5% of the organizations had 5-7% location sites.

Section IV- Education Content

14. The curriculum you use for your nutrition education classes is designed by: Check all that apply.

Curriculum for nutrition education classes	**# Of Organizations**	**%**
Diabetes education program	8	7.08
USDA (MyPlate)	24	21.24
Other USDA Resources	12	10.62
A combination of different sources put together by your organizations	32	28.32
American Heart Association	9	7.96
Academy of Nutrition and Dietetics	11	9.73
American Cancer Society	6	5.31
*Other – AICR, Institute for functional medicine, our own in-house developed curriculum, American college of obstetricians and Gynecologists	11	9.73
Total	113	100

Analysis of the survey responses revealed that majority of the organizations (28%) used a combination of different sources put together by their organizations to build the curriculum and USDA MyPlate (21%). Organizations also used other USDA resources (11%), Academy of Nutrition and Dietetics (10%), American Heart Association (8%), Diabetes education program (7%) and American Cancer Society (5%). Ten percent (10%) of the respondents reported their organizations used resources from AICR, Institute for functional medicine and American college of obstetricians and Gynecologists.

Figure 3: Distribution (%) of program curriculum by organizations

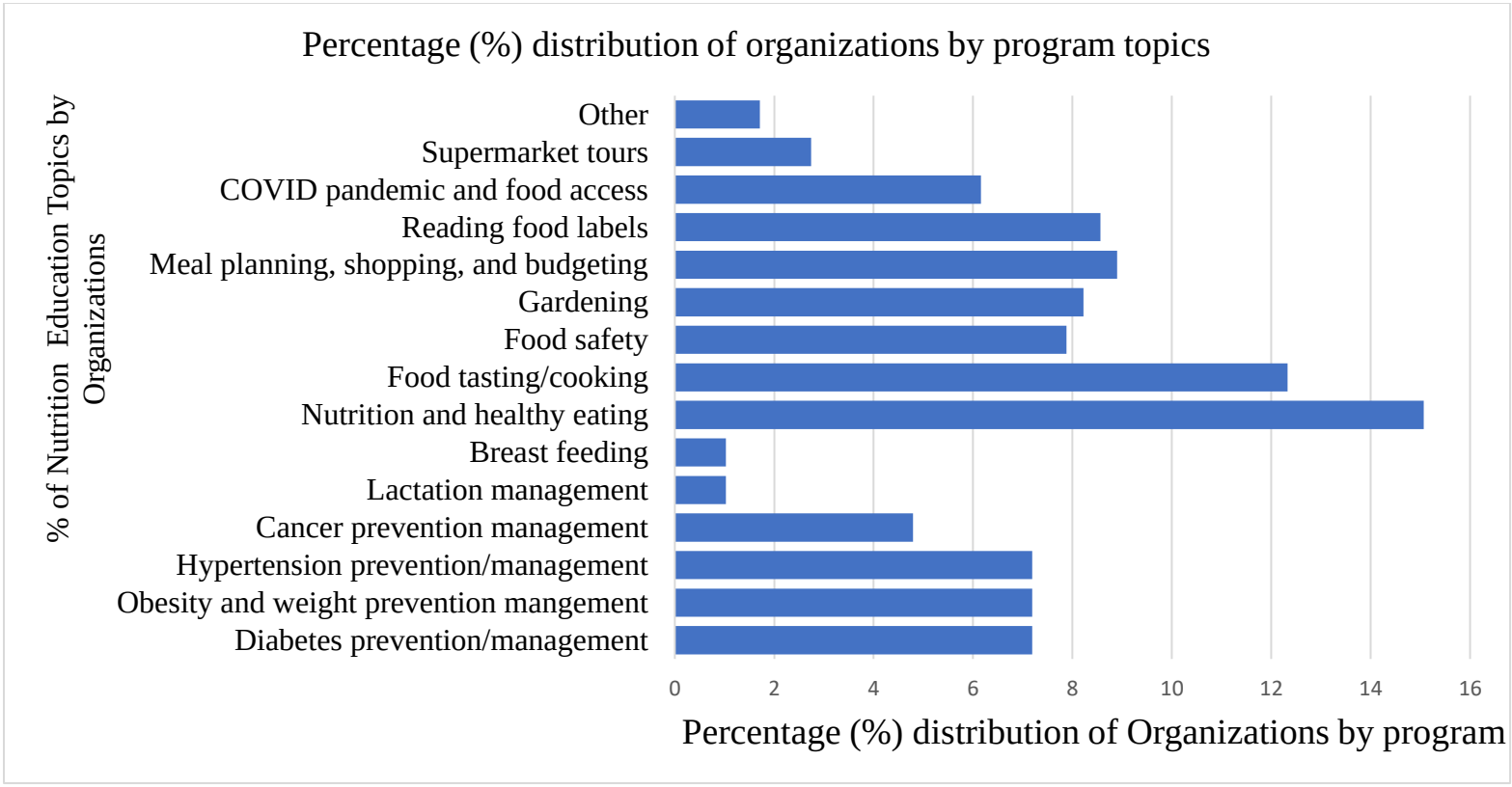


Figure 3 shows Distribution of program curriculum by organizations.

15. What is the **focus** of your nutrition education program(s). Check all that apply.

Focus of nutrition education program(s)	**# Of Organizations**	**%**
Prevention/management of obesity	19	9.79
Prevention/management of diabetes	18	9.28
Prevention/management of hypertension	18	9.28
Prevention/management of other chronic diseases	18	9.28

Food systems/understanding where and how foods is produced	27	13.29
Senior nutrition	18	9.28
Nutrition & Pregnancy/Breastfeeding	9	4.64
Healthy eating	47	24.23
Prevention/management of cancer	10	5.15
*Other (Gardening, Culinary skills, Cooking Matters, Prevention and management of auto immune disorders and Gourmet and Medicinal Mushrooms	10	5.15
Total	194	100

Focus of nutrition education lessons overlapped among the organizations. Most of the organizations focused on Healthy eating (24%) and Food systems/understanding where and how foods is produced (13%). Other focus areas for nutrition education in the organizations included prevention/management of obesity (10%), prevention/management of diabetes (9%), prevention/management of hypertension (9%), and prevention/management of other chronic diseases (9%). Organizations focused on prevention/management of cancer (5%) and nutrition and pregnancy/breastfeeding (5%). The respondents reported other areas (5%) organizations focused on were gardening, culinary skills, cooking matters, prevention, and management of autoimmune disorders and gourmet and medicinal mushrooms.

16. What **topics** do you cover in your programs? Check all that apply.

Topics Covered in nutrition education programs	**# Of Organizations**	**%**
Diabetes prevention/management	21	7.19
Obesity and weight prevention/management	21	7.19
Lactation management	3	1.03
Breast feeding	3	1.03
Nutrition and healthy eating	44	15.07
Food tasting/cooking	36	12.33
Food safety	23	7.88
Gardening	24	8.22
Meal planning, shopping, and budgeting	26	8.90
Reading food labels	25	8.56
COVID pandemic and food access	18	6.16
Hypertension prevention/management	21	7.19
Cancer prevention management	14	4.79
Supermarket tours	8	2.74
Other responses – Food allergies/sensitivities/hormones/lab	5	1.71

testing, mushroom cultivation, and use, reversing chronic disease, through plant-based diet, chronic disease management is more of an individual nutrition counseling/medical nutrition therapy event		
Total	292	100

The analyzed survey responses showed that the predominant topics covered were nutrition and healthy eating (15%), food tasting/cooking (12%), meal planning, shopping, and budgeting (9%), reading food labels (9%), gardening (8%), food safety (8%), obesity and weight management (7%) and diabetes prevention/management (7%).

Section V- Nutrition education effectiveness

Nutrition education theory provides guidance on exactly how to design the various intervention components and educational strategies to reach more people effectively.

17. Does your organization use any theory to guide the design of your nutrition education?

Organization use of theory in the design of nutrition education	**# Of Organizations**	%
Yes	**10**	25.64
No	**15**	38.46
Not sure	**14**	35.90
Total	**39**	100

Analysis of the survey responses showed that thirty-nine organizations responded to the survey question on the use of theories to guide design of nutrition education programs. Majority of the respondents reported their organizations did not use theory to provide guidance on design of the nutrition education interventions (38%), thirty-six percent (36%) were not sure if the organization used nutrition education theory to design the interventions. Twenty-six percent (26%) of the organizations used theory to design the nutrition education program.

Figure 4: Distribution by organizations for use of theories for program design

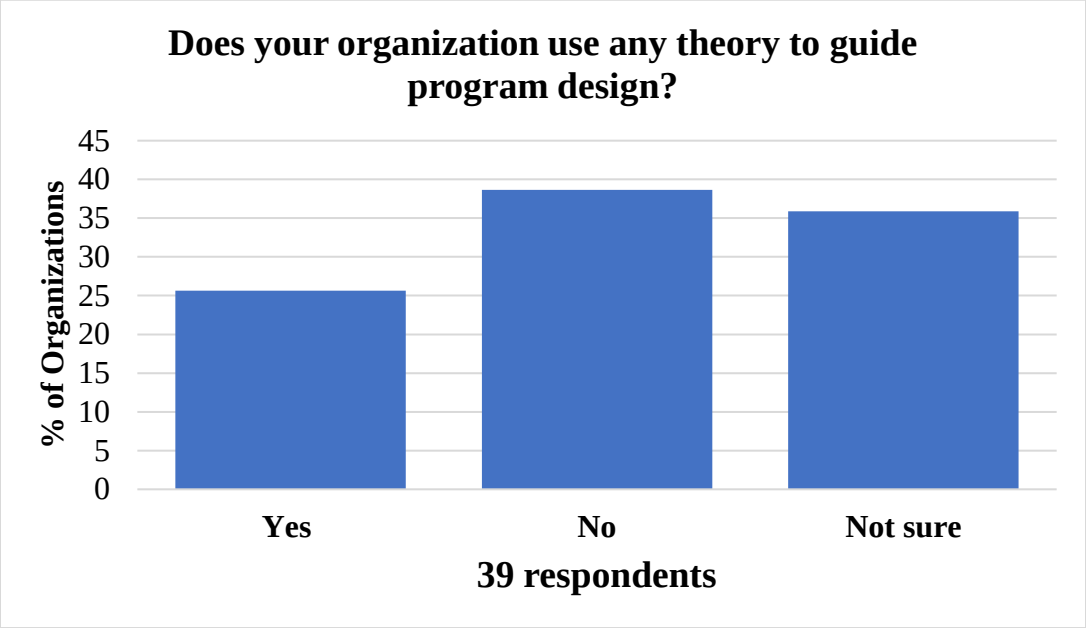


Figure 4 shows percentage distribution of the organizations use of theory in the design of programs.

18. If your response was yes to the previous question, which theory does your organization use as a guide to design the nutrition education program it provides. Check all that apply.

Theory used in the design of nutrition education	**# Of Organizations**	%
Health belief model	**6**	42.86
Theory of Planned behavior	**1**	7.14
Social Cognitive Theory	**4**	28.57
*Other – Transtheoretical model, Healthy food = Healthy person and planet, based on contractor not available.	**3**	21.43
Total	**14**	100

Of the respondents that reported their organizations used nutrition education theory for the design of the programs, 43% used the health belief model, 29% used the social cognitive theory, 7% used theory of planned behavior. In addition, 22% of the respondents reported their organizations used design from the other category, which included use of external contractor for evaluations.

Nutrition education effectiveness means the nutrition education program delivered the intended results.

19. Does your organization measure the effectiveness of nutrition education?

Organization measurement of nutrition education effectiveness	**# Of Organizations**	%
Yes	**21**	40.38
Yes, for certain classes	**9**	17.31
No	**16**	30.77
Not sure	**6**	11.54
Total	**52**	100

Analysis of the survey responses to the question on organization's measurement of nutrition education effectiveness showed that forty percent (40%) of the organizations measure the effectiveness of the education they provided, 17% of the organizations measure the effectiveness of their education for certain classes offered, 31% did not measure the effectiveness of their nutrition education and 12% were not sure if their organizations were measuring the effectiveness of the nutrition education program.

20. How would you rate the overall effectiveness of the nutrition education of your organization?

Extent of effectiveness of Organization's nutrition education	**# Of Organizations**	%
Very effective	**14**	30.43
Effective	**24**	52.17
Neither Effective nor Ineffective	**5**	10.87
Ineffective	**0**	0.00
Very Ineffective	**0**	0.00
Not sure	**3**	6.52
Total	**46**	100

Analysis of the survey with regards to the effectiveness of the nutrition education program(s), showed that 30% of respondents perceived the nutrition education provided by their organization was very effective 52% perceived the nutrition education was effective. Furthermore, the perception of 11% was that their nutrition education was neither effective nor ineffective, and 7% were not sure of the impact of the nutrition education on participants.

21. Anthropometric/clinical data collected. Indicate whether your program collects any of the following data. Check all that apply.

Anthropometric/clinical data collected by the Organization's nutrition education program	**# Of Organizations**	%
The nutrition education program collects data on participant's weight	**13**	37.14
The nutrition education program collects data on participant's blood pressure	**8**	22.86
The nutrition education program collects data on participant's cholesterol	**6**	17.14
The nutrition education program collects data on participant's waist circumference	**0**	0.00
The nutrition education program collects data on BMI	**8**	22.86
Total	**35**	100

Analysis of the survey responses showed that of the eighty-one (81) respondents that participated in the survey, thirty-five (35) of the respondents reported they collected data on anthropometric/clinical data. Thirty seven percent (37%) of the organizations collected data on participant's weight for the program they offered, 23% collected data on participant's blood pressure and 23% on participant's BMI. Respondents reported that 17% of the organizations collected data on participant's cholesterol.

22. Did anthropometric and (or) clinical indicators change because of your program(s)

Anthropometric/clinical Indicators change because of Organization's nutrition education program	**# Of Organizations**	%
Yes	**6**	30.00
No	**14**	70.00
Total	**20**	100

Analysis of the survey showed that of the twenty (20) respondents that reported on whether anthropometric or clinical indicators changed for program participants because of the organization's nutrition education, 30% reported the anthropometric and clinical indicators of the

participants changed while 70% reported that their organization's anthropometric/clinical indicator did not change because of their education program.

23. If yes, specify the direction of change of the anthropometric and (or) clinical indicator. Check all that apply.

Anthropometric/clinical indicators Improved because of the Organization's nutrition education program	**# Of Organizations**
Weight	**6**
Blood pressure	**4**
Cholesterol	**3**
HbA1c	**4**
BMI	**4**
Other -	**0**
Total	**21**

Analysis of the survey responses to the question on whether the anthropometric and clinical indicator improved showed that less than 30% of the organizations (21) collected anthropometric and clinical data for the program participants. Of the organizations that collected data, 29% of the organizations reported weight of their participants improved because of the program, 19% of the organizations reported blood pressure improved. Similarly, 19% of the organizations reported Hemoglobin A1c and 19% of the organizations reported BMI improved. Lastly, 14% of the organizations reported cholesterol levels of their participants improved because of the nutrition education programming provided to the participants.

Anthropometric/clinical indicators worsened because of the Organization's nutrition education program	**# Of Organizations**
Weight	**0**
Blood pressure	**0**
Cholesterol	**0**
HbA1c	**0**
BMI	**0**
Other -	**0**
Total	**0**

None of the organizations reported that health outcomes worsened for participants enrolled in the programs.
Nutrition education programs surveyed positively impact the participants health outcome including weight, blood pressure, cholesterol, hemoglobin A1c and BMI.

Anthropometric/clinical indicators was neutral because of the Organization's nutrition education program	# Of Organizations
Weight	**1**
Blood pressure	**1**
Cholesterol	**0**
HbA1c	**1**
BMI	**0**
Other -	**0**
Total	**3**

Respondents reported that majority of Programmers (86%) that collected anthropometric and clinical data perceived that the nutrition education they provided had a positive impact on participant's health outcome: weight, blood pressure, hemoglobin A1c and BMI of the survey of nutrition educators showed. 14% of the 21 organizations that collected data on anthropometric and clinical data reported the program had a neutral impact on participant's weight, blood pressure and hemoglobin A1c.

Behavioral data collected

24. Select the appropriate response for the following behavioral data for nutrition education program(s).

Behavioral data assessed used in nutrition education	Response (Yes) # Of Organizations/%	Response (No) # Of Organizations/%	Total # Of Organizations
The assessment used in the nutrition education program asks questions about patients' **fruit and vegetable consumption**	28 (90.32%	3 (9.68%)	31
The assessment used in the nutrition education program asks questions about consumption of **high sodium food**	14 (50.00%)	14 (50.00%)	28
The assessment used in the nutrition education program asks questions about consumption of **sugar and sweetened beverages**	17 (60.71%)	11(39.29%)	28
The assessment used in the nutrition education program asks questions about consumption of **foods high in saturated fats**	13 (48.15%)	14 (51.85%)	27

The assessment used in the nutrition education program asks questions about consumption of **whole grains**	16 (61.54%)	10 (38.46%)	26

Ninety percent (90%) of the organizations assessed fruits and vegetable consumption of their program participants, 62% assessed consumption of whole grains, 61% assessed consumption of sugar and sweetened beverages, 50% assessed consumption of high sodium food, and 48% assessed consumption of foods high in saturated fats.

Section VI – Nutrition education evaluation methods

25. How is the impact of your nutrition education program evaluated? Check all that apply.

Tools for evaluation of Impact of nutrition education program(s)	**# Of Organizations**	%
Post test	**1**	1.27
Pre and Post test	**17**	21.52
Anecdotal feedback	**23**	29.11
Anthropometric and (or) Clinical indicators	**4**	5.06
Formative evaluation at intervals during nutrition education delivery	**8**	10.13
Summative evaluation at the end of the program	**14**	17.72
None of the above	**9**	11.39
Other responses - most nutrition education is one on one, progress depends on individual plan of action, communication from participants, survey	**3**	3.80
Total	**79**	100

The organization's nutrition education programs measure the impact of the programs using anecdotal feedback from program participants (29%), Pre, and Post -test evaluations (22%) and summative evaluation at the end of the program (18%).

Figure 5: Evaluation Tools for measurement of program Impact by Organizations

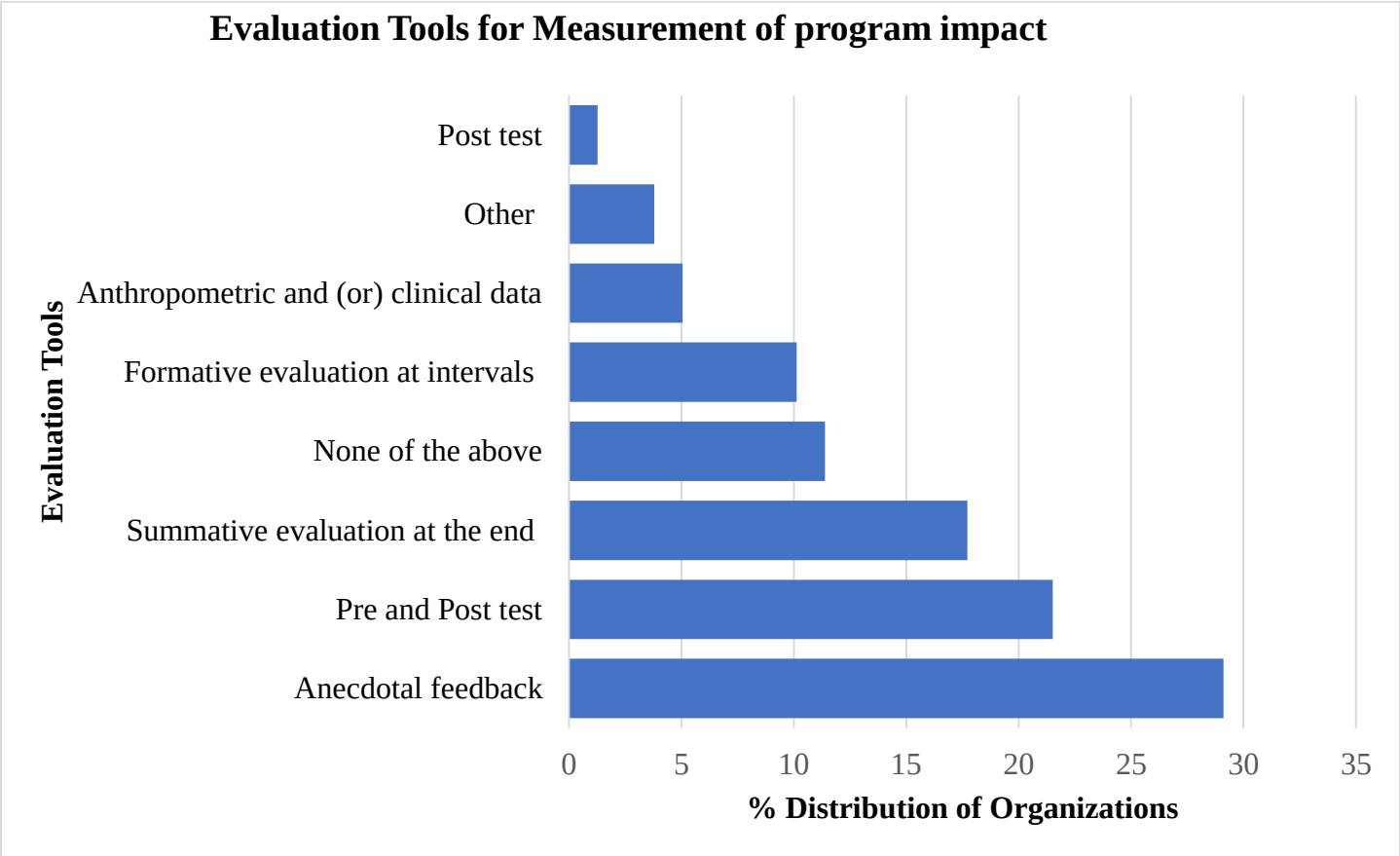


Figure 5 shows respondents use of evaluation tools for assessments in the organizations.

26. Are the assessment tools validated?

Validated assessment tools status	# Of Organizations	%
Yes	**15**	35.71
No	**17**	40.48
Don't know	**10**	23.81
Total	**42**	100

Analysis of the nutrition educators survey revealed that of the 81 organizations that participated in the survey, 15 organizations used validated tools for program evaluation, 17 organizations did not use validated instrument. Thirty six percent (36%) of the organizations that responded to survey question on assessment tools validation used validated tools, 41% of the organizations did

not use validated tools while 23% of the organizations are not sure if the tools used for evaluation of their program was validated.

Figure 6: Validated assessment tools status

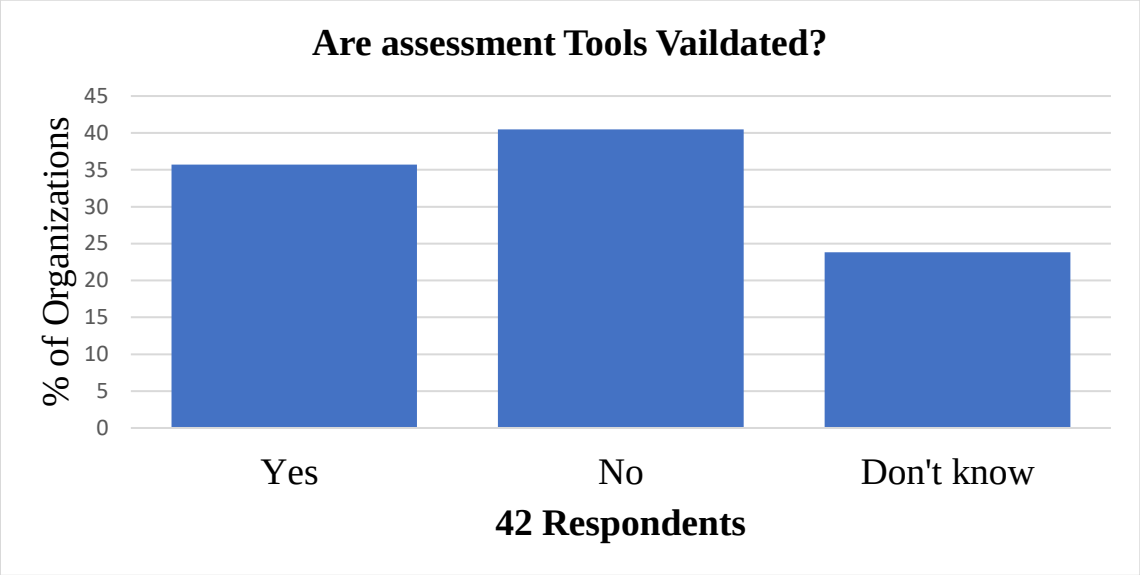


Figure 6 shows 42 respondents results on use of validated assessment tools.

27. A nutrition education program model(s) is the system or approach by which nutrition education program is delivered. Check all that apply.

Nutrition education delivery model	**# Of Organizations**	%
Direct delivery of nutrition education to participants	**43**	75.44
Indirect education (Train – the – trainer)	**11**	19.30
Not sure	**2**	3.51
Other	**1**	1.75
Total	**57**	100

A descriptive analysis of the nutrition educators survey revealed that a combination of one or more of the program models is used by the organizations. Majority of the organizations (75%) that responded to the survey question on program model provided nutrition education directly to their program participants while 19% of the respondents reported their organization provided nutrition education indirectly via Train-the -Trainer. Less than 2% of the respondents reported that their organizations used other methods other than direct and indirect nutrition education for program participants. 4% of the respondents were not sure of the model of delivery of nutrition education in their organization.

28. Who conducts the program evaluation? Check all that apply.

Nutrition education program evaluation	**# Of Organizations**	%
Program staff	**31**	58.49
Internal monitoring and evaluation staff	**15**	28.3
*Other responses -service members, nutrition educator, consultant, nursing student and staff	**7**	13.21
Total	**53**	100

A descriptive analysis of the survey showed that evaluation of nutrition education programs is majorly conducted by the program staff (58%), Internal monitoring and evaluation staff (28%) and *Others (13%) who conducted the evaluation include service members, consultant, nursing student and staff.

29. What is included in the program evaluation? Check all that apply.

Metrics for nutrition education program(s) evaluation	**# Of Organizations**	%
Knowledge	**33**	25.19
Skills	**25**	19.08
Attitude/Self-efficacy	**28**	21.37
Behavior	**29**	22.14
Anthropometric indicators	**7**	5.34
Clinical indicators	**7**	5.34
Other – number of people we connect to food resources, student awareness and behavioral shifts in disposition to food choices as well as unfamiliar healthier foods	**2**	1.53
Total	**131**	100

Analysis of the survey showed that organizations used the following metrics for program evaluation: knowledge (25%), skills (19%), attitude/self-efficacy (21%), behavior (22%). Five percent (5%) of the respondents reported that organizations include anthropometric and clinical indicators as metrics for program evaluation. Other metrics (2%) used by organizations for evaluation of programs include a measure of the number of people connected to food resources by the organizations, students' awareness, and behavioral shifts in disposition to food choices as well as a measure of participant's unfamiliarity with healthier foods.

Knowledge

30. What knowledge did participants gain from your lessons? Check all that apply.

Knowledge participants gained from lessons	**# Of Organizations**	%
Identify food groups	**34**	21.52
Identify healthy beverages choices	**23**	14.56
Understanding of half my MyPlate should be fruits and vegetables	**25**	15.82
Reading food labels	**31**	19.62
Identify foods high in fiber	**22**	13.92
Identify food high in saturated fats	**14**	8.86
Other – increase fruit and vegetable consumption, identify post diet transplant components, mushroom nutrition and medicinal use, plant-based diet, changes client has made.	**9**	5.70
Total	**158**	100

Analysis of the survey of nutrition educators revealed that nutrition education program impacted the knowledge of participants. Twenty two percent (22%) of the organization reported that their participants could identify food groups, identify healthy beverage choices (15%), had an understanding that half of MyPlate should be fruits and vegetables (16%), read food labels (20%), identified foods high in fiber (14%) and identified food high in saturated fats (9%). Other (6%) knowledge gained by the nutrition education programs include increased fruit and vegetable consumption, identified post diet transplant components, mushroom nutrition and medicinal use, plant-based diet and knowledge of the changes client had made to diet.

Skills

31. What skills were built through your lessons? Check all that apply.

Skills built through lessons	**# Of Organizations**	%
Cooking easy, to prepare healthy meals	**38**	39.18
Making healthy purchases	**26**	26.80
Planning meals for self- and/ or family	**27**	27.84
Other – making appropriate food choices, self-coaching, alternative coping skills to substitute LLP eating, mushroom cultivation, increasing access, production consumption,		

enjoyment, and benefits of plant-based diets choices, urban gardening		
Total	**97**	100

A descriptive analysis of the survey of nutrition educators revealed that the predominant skills developed by program participants in the organizations were cooking easy, preparation of healthy meals (39%), making healthy purchases (27%) and planning meals for self and (or) family. Other skills built through the (28%) nutrition education program lessons by program participants include making appropriate food choices, self-cooking, alternative coping skills to substitute LLP eating, mushroom cultivation, increasing access, production consumption, enjoyment of meals, and benefits of plant-based diets choices and urban gardening.

Behaviors

32. What behaviors change with your lessons? Check all that apply.

Behaviors that changed with the lessons	**# Of Organizations**	%
Increase in home cooked healthy meals	23	12.64
Increased fruit and vegetable consumption	39	21.43
Increased whole grain consumption	15	8.24
Increased Consumption of low-fat/fat - free milk and/or fortified soy beverages	7	3.85
Increased consumption of healthy fats and oils	8	4.40
Increased consumption of Fiber-rich foods	11	6.04
Increased water intake	15	8.24
Limited consumption of added sugars	17	9.34
Limited consumption of saturated fats	10	5.49
Limited consumption of sodium	12	6.59
Increased the frequency of preparing meals at home	20	10.99
Other responses – How to shop for health food choices at food bank and pantries, increased access and consumption of healthy fresh organic produce, N/A outcomes not tracked.	5	2.75
Total	182	

Analysis of the survey showed that majority of the organizations (39%) that evaluated the impact of the nutrition education lessons, recorded an increase in fruit and vegetable consumption by participants based on the lessons they provided. In addition, organizations reported the lessons increased in-home cooked healthy meals (13%). Furthermore, 11% of the organization's lessons, increased the frequency of preparing meals at home. In addition, behavior changes reported by

included limited consumption of added sugar (9%), increased whole grain consumption (8%), increased water intake (8%), limited sodium consumption (7%), increased consumption of fiber rich foods (6%), limited consumption of saturated fats (5%), increased consumption of healthy fats and oils (4%) and increased consumption of low-fat/fat -free milk and/or fortified soy beverages (4%).
Three percent (3%) reported other responses which included how to shop for health food choices at food bank and pantries, increased access and consumption of healthy fresh organic produce, N/A outcomes not tracked.

Section VII – Nutrition education accessibility

33. **Accessibility means how readily available and affordable the nutrition education program (s) is to the target audience.** Check the appropriate response.

Measure of accessibility of nutrition education program	**Strongly disagree**	**Somewhat disagree**	**Neither agree nor disagree**	**Somewhat agree**	**Strongly agree**	**Total**
The nutrition education program is accessible to residents of the District of Columbia	0 (0.00%)	5 (10.00%)	8 (16.00%)	13 (26.00%)	24 (48.00%)	50 (100%)
The nutrition education program is within a reasonable distance from the target population	2 (4.08%)	2 (4.08%)	4 (8.16%)	11 (22.45%)	30 (61.22%)	49 (100%)

Of the 50 respondents that answered the survey question on accessibility, 24 (48%) strongly agree that nutrition education programs are accessible to target audience. The predominant perception is that nutrition education program is within a reasonable distance (61%) from target audience.

34. Choose the most appropriate response

Measure of accessibility (affordability)	**Yes # Of organizations/%**	**No # Of organizations/%**	**Total**
The nutrition education program charges a fee to the program participants	8 (17.02%)	39 (82.98%)	47 (100%)
The nutrition education program is	41 (91.11%)	4 (8.89%)	45 (100%)

free for the program participants			

Eighty three percent (83%) did not charge a fee for the program their organization for the nutrition education they provided. Majority of the respondents reported that their programs were free (91%) for residents to participate.

Section VIII – Funding

35. How is your nutrition education program funded? Check all that apply.

Sources of Funding for nutrition education programs	**# Of Organizations**	**%**
Public (funding that comes from public treasury – taxes etc.)	9	8.11
Grants	37	33.33
Private funding	14	12.61
Federal	10	9.01
Fund raising/donations	22	19.82
*Other – Company funding programming, Medstar, Medicaid, participant fees, corporate program Giant Food	11	9.91
No funding	8	7.21
Total	111	100

The majority of the organizations received funding for their programs through grants (33%), 20% through fund raising/donations, private funding (13%), and federal (9%). *Other sources funding sources of funding (10%) included company funding programming, Medstar, Medicaid, participant fees, Giant food Inc. Seven percent did not receive any funding for their nutrition education programs.

36. Are you open to partnering with other nutrition education programs for funding opportunities?

Open to partnership with other nutrition education programs for funding opportunities	**# Of Organizations**	**%**
Yes	38	77.55
No	11	22.45

Seventy-eight (78%) of the respondents that answered the survey question on open to partnership with other nutrition education programs for funding opportunities stated that their organizations are open to partnership with other nutrition education programs for funding opportunities. Twenty two percent (22%) of the organizations are not open to partnership with other nutrition education programs for funding opportunities.

Section IX – Demographics

37. The location(s) of the nutrition education program(s) you provide? Check all that apply.

Location by Wards	# Of Organizations	%
Ward 1	25	12.44
Ward 2	17	8.46
Ward 3	19	9.45
Ward 4	10	4.98
Ward 5	30	14.93
Ward 6	26	12.94
Ward 7	36	17.91
Ward 8	38	18.91
Total	201	100

Descriptive analysis of the survey shows that majority of the organization in D.C. have program sites in Ward 8. Thirty-eight (38) different non-governmental organizations have program sites (19%) in Ward 8, thirty-six of them (18%) have program sites in Ward 7, thirty organizations have program sites in Ward 5 (15%), twenty -six organizations (13%) in Ward 6, and twenty-five organizations have program sites located in Ward 1(12%). Other location sites in D.C are Ward 3 with nineteen organizations (9%), Ward 2 has seventeen different organizations program sites (8%) and Ward 4 has ten different organizations with program sites (5%). There is an overlap in nutrition education programs by locations and by extension target population.

38. In what language (s) is your nutrition education program (s) conducted? Check all apply

Languages	# Of Organizations	%
English	52	61.90
Spanish	26	30.95
Arabic	1	1.19
Chinese	3	3.57
Aramaic	1	1.19
Other - Creole	1	1.19
Total	84	100

Sixty-two (62%) of the organizations conducted their nutrition education programs in English, 31% in Spanish, 4% in Chinese, 1% in Arabic, and 1% in Aramaic and Creole (1%).

Section X – Additional Information

39. Choose the most appropriate response

COVID -19 Impact on nutrition education	**Strongly disagree**	**Somewhat disagree**	**Neither agree nor disagree**	**Somewhat agree**	**Strongly agree**	**Total**
COVID 19 Pandemic has **decreased recruitment** of nutrition educator(s)	5 (10.20%)	13 (26.53%)	18 (36.73%)	10 (20.41%)	3 (6.12%)	49
COVID 19 Pandemic has **decreased retention** of nutrition educator(s)	4 (8.33%)	9 (18.75%)	21(43.75%)	10 (20.83%)	4 (8.33%)	48
COVID 19 Pandemic has decreased recruitment of participants	8 (16.33%)	10 (20.41%)	15 (30.61%)	9 (18.37%)	7 (14.29%)	49
COVID 19 Pandemic has decreased retention participants	7 (14.29%)	10 (20.41%)	13 (26.53%)	13 (26.53%)	6 (12.24%)	49

Impact on recruitment of nutrition educators

The perception of the impact of COVID 19 on nutrition education varied among respondents. Thirty-seven percent (37%) of respondents were indifferent as regards the COVID 19 pandemic impact (decreased recruitment) on recruitment of nutrition educators however, twenty-seven percent (27%) somewhat disagree, ten percent (10%) strongly disagree. On the contrary, twenty percent (20%) somewhat agree and three percent (3%) of respondents strongly agree that the pandemic decreased recruitment of nutrition educators.

Impact on retention of nutrition educators

Forty-four percent (44%) of the respondents were indifferent as regards the COVID 19 pandemic impact (decreased retention) on retention of nutrition educators, however, 19% somewhat disagree that COVID 19 pandemic decreased retention of nutrition educators, 8% strongly

disagree. Conversely, 21% of respondents somewhat agree that the pandemic decreased retention of nutrition educators while 8% strongly agree that COVID 19 pandemic decreased retention of nutrition educators.

Impact on recruitment of participants

The perception of the impact of COVID 19 on nutrition education varied among respondents. Thirty-one percent (31%) of the respondents were indifferent as regards the COVID 19 pandemic impact (decreased recruitment) on recruitment of participants however, twenty percent (20%) somewhat disagree, sixteen percent (16%) strongly disagree. On the contrary, eighteen percent (18%) somewhat agree and fourteen percent (14%) of respondents strongly agree that the pandemic decreased recruitment of participants.

Impact on retention of participants

Twenty-seven percent (27%) of the respondents were indifferent as regards the COVID 19 pandemic impact (decreased retention) on retention of participants, however, 20% somewhat disagree that COVID 19 pandemic decreased retention of participants, 14% strongly disagree. Conversely, 27% of respondents somewhat agree that the pandemic decreased retention of participants while 12% strongly agree that COVID 19 pandemic decreased retention of participants.

Results addressing research question #4. What are the gains and losses of D.C. investing or not investing in nutrition education?

Nutrition education is a fundamental component for improving public health. Several peer reviewed articles have demonstrated the effect of poor health on productivity. Healthier working age people would be more likely to remain in the workforce and be more productive while working, which would contribute faster annual Gross Domestic Product (GDP) growth.

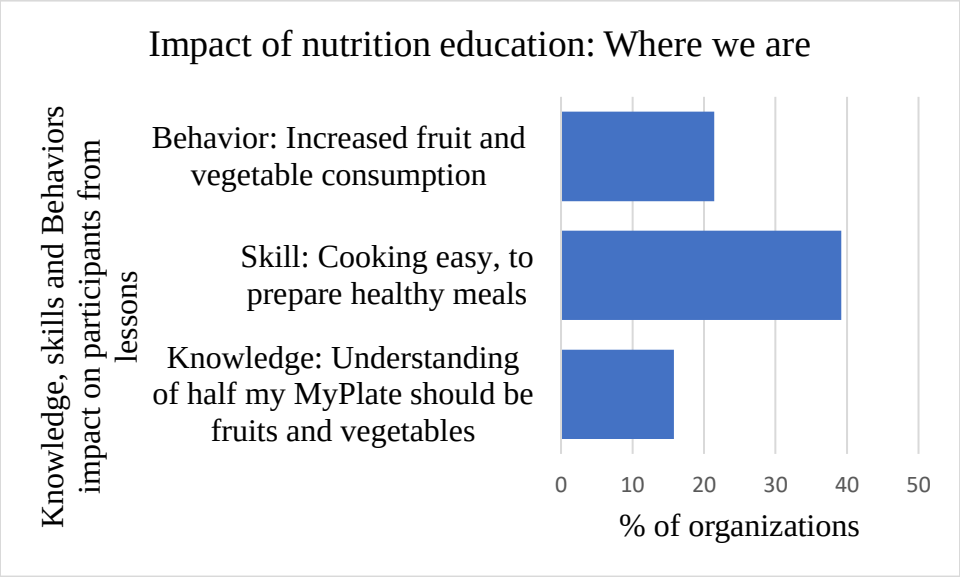
During the interviews, key informants expressed that there was high level of food insecurity among majority of the population that they served. If D.C. fails to invest in nutrition education, the level of food insecurity will continue to increase. Data gathered from a publication by feeding America shows that in D.C., 65,750 people are facing hunger and of them 19,430 are children. The District has the highest rate (20.1%) of seniors in the nation facing food insecurity. The implication of this is a massive burden to the economy and steady decline in productivity.

In, addition, majority of the key informant interview participants expressed that their nutrition education programs were effective because they observed behavior changes in the people they served, however behavior change is a medium-term outcome as illustrated in the community nutrition logic model. Therefore, to sustain behavior changes observed in the long-term policies that support funding to leverage environmental support and resources is paramount. For example, survey results showed that, the majority of the organizations received funding for their programs through grants (33%), twenty percent (20%) through fund raising/donations, private funding (13%), and federal (9%). *Other sources of funding (10%) included company funding programming, Medstar, Medicaid, participant fees, Giant food Inc. Seven percent (7%) did not receive any funding for their nutrition education programs. These results indicate that there is need for more government funding for nutrition education in non-governmental organizations in D.C.

District of Columbia investment through funding of nutrition education will enhance performance of nutrition education personnel through trainings, development of sustainable Geographic Information system (GIS), access to more resources for the populations they serve and ultimately effective delivery of nutrition education for improved health outcomes and more productive residents.

Figure 7 below shows respondents results to the questions: what behavior changed with your nutrition education program lessons, what skills did participant learn from your lessons, what knowledge participant gained from your lessons. On the other hand, Figure 8 shows opportunities for policies to support funding for nutrition educators to leverage environmental support and resources for program participants.

Figure 7: Respondents results to the survey questions: #30 what knowledge participant gained from your lessons, #31 what skills did participant learn from your lessons, and #32 what behavior changed with your nutrition education program lessons



Respondents results to the questions: what behavior changed with your nutrition education program lessons, what skills participant learn from your lessons, what knowledge participant gained from your lessons.

Figure 8: Respondents responses to survey questions #30, #31, #32 versus total number of survey participants (81): Opportunities for policies to support funding for nutrition educators to leverage environmental support and resources for program participants

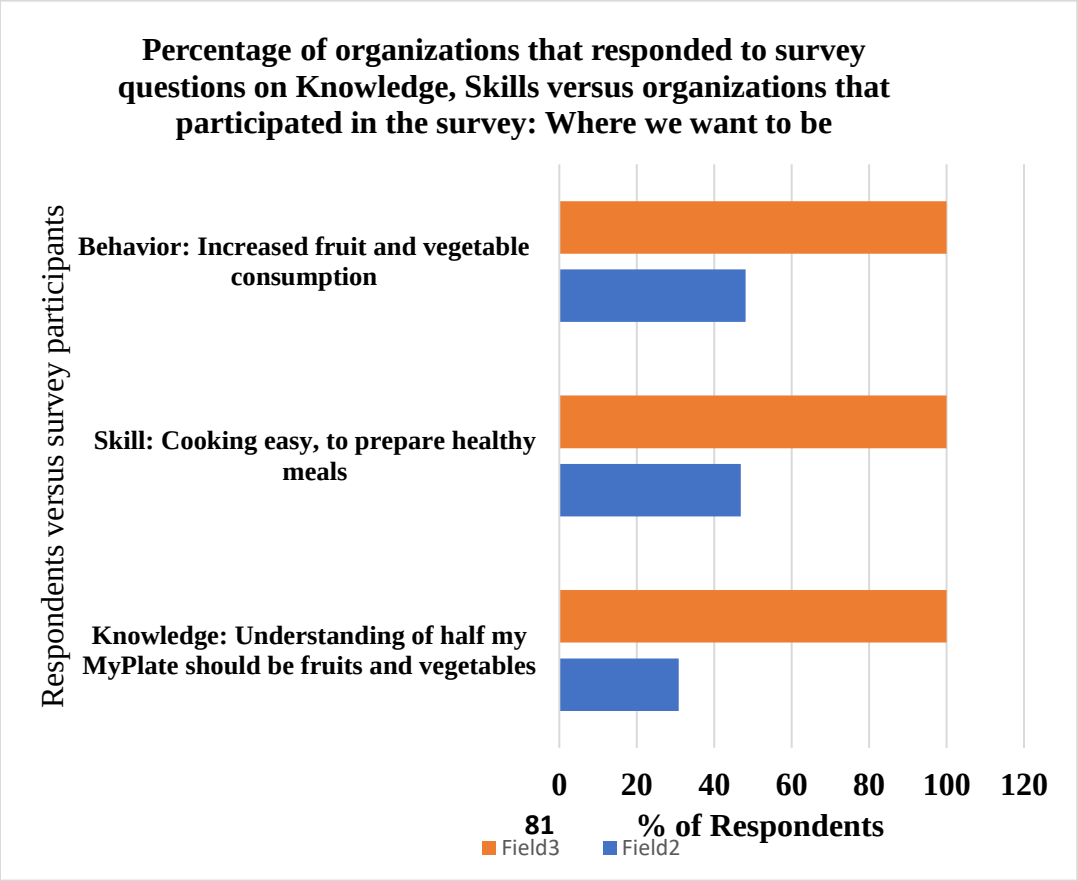


Figure 8 shows opportunities for policies to support funding for nutrition educators to leverage environmental support and resources for program participants.

2.4 Gaps and issues to be addressed.

Based on the results, ten gaps and issues were identified that needs to be addressed and four key recommendations were made among which included a template for data collection and program. Below are the gaps and issues to be addressed that were identified.

I. Lack of a systematic program evaluation for participants.

- The organizations were conducting evaluations, however, a majority lacked a systematic evaluation process. For example, some key informant respondents indicated that if a program was delivered by qualified and credentialed professionals, a formal evaluation may not be needed. Even though, all the Participants in the key informant interview agreed that nutrition education is vital, they expressed that in most cases nutrition education was a piece of a broader program, therefore, the organization lacked clear goals (including evaluation) for nutrition education.
- The majority of the respondents did not conduct long-term follow-up with program participants, a key element of systematic program evaluation.
- Nutrition education evaluation tools for assessment should be valid, reliable, objective, practical, comprehensive, adequate, and comparable. These characteristics give programmers insight for actionable next steps for long-term follow up and sustainability of program outcomes. Evaluation of the survey showed that of the 81 non-governmental organizations surveyed, 19% used validated tools for assessment, 21% did not use validated tools, 12% of the organizations were not sure if the tools used for assessment were validated. Thirty-nine of the non-governmental organizations making 48% of the surveyed organizations did not respond to the survey question on assessment tools

validation used by their organizations. An evidence-based peer reviewed article by Haney (2018) showed that those programs that used evaluation methods with follow-up tracking of participants' adherence to nutritional recommendations, use the Plan-Do-Study-Ask methodology. This method employed the use of data collection form before and after implementation of the supplemental nutrition education.

II. Inconsistent Nutrition Programs across Wards.

There are gaps in the number and types of non-governmental nutrition education programs offered to residents among the Wards. In some Wards there are multiple sites with the same programming. In other Wards, there are very few programs offered. These inconsistencies contribute to information disparities among Wards.

- The distribution of the number of nutrition education programs offered by Organizations in the Wards is as follows:

  Ward 1: Twenty-five (25) organizations have program sites (13%)

  Ward 2: Seventeen organizations have program sites (8%)

  Ward 3: Nineteen (19) organizations have program sites (9%)

  Ward 4: Ten (10) organizations have program sites (5%)

  Ward 5: Thirty (30) organizations have program sites (15%)

  Ward 6: Twenty-six (26) organizations have program sites (13%)

  Ward 7: Thirty-six (36) organizations have program sites (18%)

  Ward 8: Thirty-eight (38) organizations have programs sites (19%)

  Some of the organizations reported multiple sites, resulting in a total of 201 that provided programs across Wards. Most of the responding organizations provided nutrition

education in schools and school-based gardens and online. There was not an even distribution of type of program sites.

- Schools and School-based gardens – 25 organizations (13%)
- Online -25 organizations (12%)
- Community and recreation centers/parks – 18 organizations (12%)

  Senior Centers – 14 organizations (7%)

  Early Children sites – 13 organizations (7%)

  Farmer's market – 13 organizations (7%)

  Health care clinics – 12 organizations (6%)

  Food pantries – 11 organizations (6%)

  Urban farms – 10 organizations (16%)

  Grocery/corner stores – 9 organizations (5%)

  Food assistance sites – 7 organizations (4%)

  Food banks – 6 organizations (3%)

  Libraries – 5 organizations (3%)

  WIC Clinics – 4 organizations (2%)

  Emergency shelters and temporary – 3 organizations (2%)

  Individual private homes – 3 organizations (2%)

III. Lack of coordination, collaboration, and environmental support.

- A lack of apparent coordination, collaboration and environmental support has also resulted in a gap between program delivery and impact on chronic diseases. In some Wards there were a large number of the same nutrition topics covered, whereas in others, there was a lack of varied subject matter: forty-four organizations covered lessons on nutrition and healthy eating, 36 taught food tasting/ cooking, 26 meal planning and

shopping, 25 reading labels, 24 gardening and 23 food safety. On the other hand, there were few organizations that reported covering topics on supermarket tours (8), lactation management (3) and Breastfeeding (3).

- With respect to program impact on participants, results of the key informant interviews and Qualtrics survey revealed that the majority of the respondents have program sites in Ward 7 and in Ward 8, however, these Wards have the highest rates of obesity and diabetes in the District.[8] For example, 44 organizations covered topics on nutrition and healthy eating, however, only 9 organizations reported their participants had gained knowledge in fruits and vegetable consumption.
- Food insecurity, food deserts and other environmental factors (ex. safe places to walk) impact the ability of program participants to follow-up on recommendations from the nutrition educators.

IV. Nutrition education program personnel and partner turnover.

- Changing of personnel within organizations and among their partners, severely affected continuity, and sustainability of nutrition education programs. Participants of the key informant interview expressed that school-based site turnover, and the ability to build relationships affected the effectiveness of nutrition education programming.

V. Time factor impact on nutrition education programs.

- A number of nutrition educators interviewed reported not having enough time to adequately conduct evaluation and follow-up with participant due to not having sufficient time to devote to the program. In addition, it took the Qualtrics survey participants an average of 5.5 days to complete a 39-item survey which should take no more than 30 - 40 minutes.

VI. Nutrition educators' knowledge gap regarding nutrition program, evaluation, assessment tools, and guiding theories.

- Only nineteen percent (19%) of program surveyed conducted evaluations. Twenty-three percent (23%) were either not sure if the program was effective or were indifferent to its effectiveness and 12% were not sure if the assessment tools were validated. In addition, 38% used theory to guide the design of programs and 34% were not sure if their organization used theories. Lastly, 4% were not sure of the nutrition education model used.

VII. Lack of program funding.

- Seven percent (7%) of the respondents reported they were not receiving any funding for nutrition education programs. Key informant interview **#7** expressed that some early childcare sites do not receive funding.

VIII. Culturally relevant and tailored nutrition education.

- There is a lack of nutrition education programs targeted to Chinese, Arhamaic, Arabic and Creole populations. For example, approximately 70,100 Chinese immigrants live in DMV area,[2] however survey showed that only 6% of the organizations conducted education in Chinese, Armarhic, Arabic and Creole. In addition, key informant expressed that nutrition education should be translated in cultures in the D.C.

IX. Lack of sufficient chronic disease specific nutrition education programs.

- The majority of the organizations (31%) provide education for anyone interested and don't target specific populations. In D.C., there is a need for more targeted communication to address specific health issues. Descriptive analysis of survey showed

that the predominant nutrition education topic and focus areas were healthy eating, cooking, and tasting.

X. Non-nutritional professionals providing nutrition education

- The survey revealed seven percent (7%) of the organizations have non-nutritional professionals providing nutrition education. Nutritionists and dietitians are well grounded in nutrition science and medical nutrition therapy. Additionally, nutrition education requires specific professional skills to design effective strategies of behavior change.[3]

2.5 Recommendations. Research Question # 5

This section addresses research question five: What are recommendations to close the gap using policy interventions and investments to include: time, talent, training, and traits. This section presents four key recommendations to address the gaps and issues identified to improve nutrition education programs for residents in the District of Columbia. These areas require funding for nutrition education.

1. Facilitate Training for nutrition educators on program assessment and evaluation.

Organizations need to have a clear understanding of how to conduct formative and summative program evaluations. There is a need to conduct training for theory and research-based content in program design; program assessment and evaluation tool reliability and validity; program design and program delivery model. (Timeline: January 2023 through May 2023).

2. Fund Collaborative support for nutrition education programs.

Funding is needed for training of organization personnel, materials to support educational sessions, hiring of personnel and to create a geographic information system (GIS) of nutrition education programs that manages, analyzes, and maps current and future data collected.

The GIS would ultimately improve communication and efficiency as well as better management and decision making. (Timeline: January 2023 through December 2023).

3. Establish Nutrition and Dietetic internship key performance indicator (KPI) for organizations.

A key performance indicator is a criterion established by an organization to evaluate and track achievement of goals for overall performance and growth.

Efficiency and time management is critical for effectiveness in nutrition education.

Organizations need to leverage on nutrition and dietetic students' skills in handling specific tasks

(e.g., documentation, collation of data) for improved productivity. There is opportunity for organizations to incorporate working with interns as key performance indicator for appraisal. (Timeline: January 2023 – continues).

4. A template for data collection and program evaluation.

Documentation is critical to effective delivery of nutrition education and long-term sustainability of behavior change in targeted audience. A template for daily/weekly documentation of nutrition educators data is recommended for use in organizations. This template if properly implemented and utilized should enhance efficiency, generation of reports in real time, and provide comprehensive data for mid-year and end of year assessment and evaluation of nutrition education programs. (See attached Excel sheet). Timeline: September 2022 – continues.

3. CONCLUSION

To truly address chronic disease and food insecurity across the District of Columbia, there must be at a minimum coordination, and ideally collaboration, of efforts among organizations providing nutrition education. The ability to evaluate the effectiveness of nutrition education programs is paramount. Training for organizations in the use of theoretical frameworks to develop programs and how to effectively design program evaluations will enhance not only service delivery but will help to frame future programming. The use of a one- and- done approach for individuals attending nutrition programs is not sufficient to affect behavior change. Follow-up and monitoring of participants is key to help ensure the ability to incorporate what was learned in the program into lifestyle changes. Policy issues to address barriers to implementing recommendations (such as increasing intake of fresh fruits and vegetables in the midst of food deserts) is key. Finally, funding is needed to support community-based nutrition education, which is critical to addressing health disparities and contributing to the reversal of the epidemic of chronic disease in the District.

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APPENDIX

A. Thematic analysis – Description of Nodes

Nodes

Name	Description
Additional Information	This includes information that is relevant to the study that was provided by participants at the end of the interview but not included in other codes
Challenges implementing program	This node identifies the challenges experienced by a participant in implementing the current program that they are involved in
Duration of thenutrition education programs offered	This node describes the duration of implementation of nutrition education programs offered
Follow-up activities	This node describes other activities included in the program beyond education
Food education	This is an aggregate node which refers to various food education programs.
Basic life skills on eating ettiquette	This node refers to food education programs that impart skills such as food budgeting, cullinary skills among others.
Food hand outs	This node refers food programs that offer food to the target populations.
Food programs	This node contains education programs allongside which nutrition education is offered.
Cooking and food recipes	This node describes a food intervention that utilised cooking demonstrations and developed food recipes.

Name	Description
Diet education	Diet education includes interventions that provided information on healthy diet and sometimes aimed at preventing chronic illnesses.
Farming as a business	This is a node that describes a food intervention that aimed at making money from farming or gardening.
Garden or farming	This node described a food interventions that was passing gardening skills to their target group and teaching nutrition education through the farm.
Incorporating education into school curriculum	This node describes interventions that sought to integrate nutrition content into existing curriculums such as school curriculums
Market	This is a node that discusses markets as food interventions that were used to pass messages to the target group and their family
Nutritional education	This node is an aggregate node that describes the nutrition education provided by the participants employer or organization
Accessibility of the education	This node includes participants perceptions on the accessability of the nutrition education component of their programs
Effectiveness of the nutrition education program	This node includes participants perceptions on the effectiveness of the nutrition education component of their programs
Measuring accessibility	This node describe how accessability was measured by the organizations represented by the participants.
Measuring effectiveness	This node describes how effectiveness of nutritional education was determined.

Name	Description
Number and description of nutrition education programs	This code includes the number of education programs and a description of what each of them entailed
Nutritional Program	This node provides general details of the nutrition program that participant is involved in. This includes its name, location and general objectives
Partner programs	This node includes details of other programs that the organization has collaborated with to provide nutrition education.
Zip codes	This node included information about the location of the nutrition programs represented by study participants.
Other programs	This node includes other interventions or services that were neither nutrition education nor food education interventions
Camps for young people	This node refers to youth camps that were offered by participants organization
Use games to reach target population	This node includes information on the use of games to reach young people.
Participants' role in organization	This node refers to a participant's role within the organization they were working in at the time of the study
Target group for nutrition education	This is an aggregate node that gives details of the group targeted by the nutrition education programs
African American	This node includes details of the target population who were African American.
Family focus	This node includes information on nutrition education programs that targetting families with information and food programs.

Name	Description
pregnant and post-partum mothers	This node includes information on nutrition education programs that were targetting pregnant and post-partum mothers.
School based	This is an aggregate node that contains information on all nutrition education or food programs that were targetted at students or educators within the school settings.
Early childhood	This node refers to nutrition education or food education programs that were targetted at the early childhood centres.
Elementary school	This node refers to nutrition education or food education programs that were targetted at the elementary school level.
High school	This node refers to nutrition education or food education programs that were targetted at the high school leve.
Middle school	This node refers to nutrition education or food education programs that were targetted at the middle school level.
Special need children	This node refers to nutrition education or food education programs that were targetted at the special need children
Teachers	This node refers to nutrition education or food education programs that were targetted at the teachers or educators.
Senior citizens	This node refers to nutrition education or food education programs that were targetted at the senior citizens.

B. Key informant Interview questions guide

Q1- What is your title, role, and responsibilities for nutrition education in your organization?

Probing Questions
What areas of DC does your organization provide nutrition education in? Zip codes

Q2 – Describe the type (s) of Nutrition education your organization provides

Probing Questions
1. Briefly describe the types of nutrition education programs your organization provides? How many programs are there in your organization?
2. Briefly describe the different types of classes and the activities, demonstrations and events that make up nutrition education in your organization.
3. What is the length of your nutrition education sessions or classes
4. Do you have follow-up sessions for your program? If yes, specify how? If no, why?

Q3 – Describe the type of people that take you classes

Probing Questions
1. Approximately, how many participants do you average per class and approximately how many participants attend your activities each month?
2. How would you describe the model used in delivering nutrition education to target audience in your organization provides? What model is used for your nutrition education?
3. What ages do you target for the activities/education you provide?
4. How would you describe the ethnicity of the people you provide nutrition education for
5. How would you describe your ethnicity

Q4 – What is the main goal of your organization and how effective is your education at meeting your organization's goal?

Probing Questions
1. Would you say, "Very effective", "Effective," "Somewhat effective", "Not that effective"
2. How does your organization measure the effectiveness of your education?

Q5 – What is your perception of the accessibility of the nutrition education program your organization provides to participants?

Probing Questions
1. Please describe how accessible you feel your nutrition education program(s) is to participants? How easy is it to find the classes? Are times convenient for people? Is it only available in certain neighborhoods?
2. How does your organization measure the accessibility of your nutrition education program(s)?

III. Closing

Do you have any additional thoughts or questions about anything we've talked about today?

Thank you for the time you've spent with me today.

C. Nutrition educators' competencies for promoting healthy individuals Section 9.1