Inclusion

Building Community and Life Skills in the Kitchen: A Partnership with Special Olympics Missouri & Undergraduate Students --Manuscript Draft--

Manuscript Number:	INCLUSION-M-21-00046R1
Article Type:	Research Article
Keywords:	IDDs; nutrition education; culinary education; kitchen confidence; community partnerships
Corresponding Author:	Jamie Daugherty, PhD Fontbonne University St. Louis, UNITED STATES
First Author:	jamie daugherty, PhD
Order of Authors:	jamie daugherty, PhD
	Alison Griffith
	Liseth Borja
Manuscript Region of Origin:	UNITED STATES
Abstract:	This study provides insights from a partnership between Special Olympics of Missouri and a Midwest university during a teaching kitchen experience conducted in spring 2021. This five-week teaching kitchen used evidence-based practices for adults with intellectual and developmental disabilities to teach culinary skills and nutrition science led by community health students. The twelve participants and their caregivers participated in five virtual one-hour-long lessons. Data collection included surveys and participant observations. Three themes emerged from the coded survey responses and observations: activity type, "doing," gaining nutrition and culinary confidence, and sustainable home meal planning strategies. Implications for practice include hands-on virtual options, providing culinary-focused themes with supporting nutritional information, and caregiver support opportunities.

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This study provides insights from a partnership between Special Olympics of Missouri and a Midwest university during a teaching kitchen experience conducted in spring 2021. This five-week teaching kitchen used evidence-based practices for adults with intellectual and developmental disabilities to teach culinary skills and nutrition science led by community health students. The twelve participants and their caregivers participated in five virtual one-hour-long lessons. Data collection included surveys and participant observations. Three themes emerged from the coded survey responses and observations: activity type, ''doing,'' gaining nutrition and culinary confidence, and sustainable home meal planning strategies. Implications for practice include hands-on virtual options, providing culinaryfocused themes with supporting nutritional information, and caregiver support opportunities.

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Introduction

Midwest University's Family & Consumer Sciences (FCS) department has a state-of-theart food instruction laboratory that with the help of university's women's giving circle grant was utilized to introduce a teaching kitchen concept. This concept is a catalyst for pairing health promotion and culinary basics in a format, which undergraduate dietetics and health education and promotion students and community partners can collaborate. Teaching kitchens can be tailored to a variety of audiences and assist in providing a life skill: basic culinary techniques, paired with self-care topics surrounding health and wellness (Teaching Kitchen Collaborative (TKC), 2021). Teaching kitchens provide knowledge and understanding in a safe space, offering educational opportunities that empower individuals to make healthy lifestyle choices. Currently the university's Teaching Kitchen is collaborating with community organizations, such as Big Brothers Big Sisters, Special Olympics of Missouri (SOMO), local health professionals, and student athletes.

Literature Review

The teaching kitchen concept was first developed by the Culinary Institute of America (CIA) and the Harvard T.H. Chan School of Public Health – Department of Nutrition (HChan). With increases in obesity and other chronic diseases, a teaching kitchen model can assist in improving the culture and conversation around how individuals eat and think about what they put into their bodies at all stages of life. Teaching kitchen concepts have been developed in nursing homes, child care facilities, workplace settings, K-12 schools, hospitals, athletic facilities, and universities. They are multidisciplinary in nature, bringing together varied disciplines and

backgrounds, allowing opportunities to learn from each other and share food experiences (TKC, 2021). Teaching kitchens provide opportunity for hands-on culinary skills and techniques overlapped with nutrition education in an experiential education setting. The goal is to empower confidence and self-efficacy when providing interventions that can lead to behavior change, impacting an individual's overall health (TKC, 2021).

A variety of community settings offer programming with a teaching kitchen concept for consumers to learn more about nutrition education and culinary applications including Cooking Matters, Operation Food Search, and many Culinary Medicine programs. These range from supporting families with limited budgets in a given region on how to shop and cook nutritious meals to more disease specific education either virtually or in person providing culinary knowledge with nutrition guidance (Cooking Matters, 2021; Operation Food Search, 2021; Polak et al., 2016,). Programs operate within a community's organizational space or their own teaching kitchen space, utilizing internal or external grant funding (Cooking Matters, 2021; Operation Food Search, 2021; Polak et al., 2016). However there is a lack of these types of programs being offered for **persons with developmental disabilities (IDD)**. For purposes of this study, a gap in program offering was identified and a dietetics and health education curricular need was met offering a pilot culinary nutrition teaching kitchen component for **persons with IDDs**.

Understanding Developmental and Intellectual Disabilities

Developmental disabilities, including intellectual disabilities, are severe, lifelong disabilities attributable to mental and/or physical impairments manifesting before age 22 years (Taggert et al., 2018; Association of University Centers on Disabilities (AUCD), Special Olympics International (SOI), Centers for Disease Control and Prevention National Center for Birth Defects and Developmental Disabilities, and Golisano Foundation, 2018), resulting in limitations in three or more of the following areas: self-care, comprehension and language skills, learning, mobility, self-direction, capacity for independent living, economic self-sufficiency, and ability to function independently without coordinated services (Ptomey & Wittenbrook, 2015). Some developmental disabilities are derived largely from physical impairments, such as cerebral palsy and epilepsy (Taggert et al., 2018; Association of University Centers on Disabilities (AUCD), Special Olympics International (SOI), Centers for Disease Control and Prevention National Center for Birth Defects and Developmental Disabilities, and Golisano Foundation, 2018).

An intellectual disability is defined as a disability originating before age 18 years characterized by significant limitations in both intellectual function and adaptive behaviors, which covers many everyday social and practical skills, including mental capacity, learning, reasoning, and problem solving. Adaptive behaviors comprise three skill areas: conceptual skills, social skills, and practical skills. Some individuals may have a condition that includes a physical and intellectual disability, such as Down syndrome (Taggert et al., 2018).

Persons with IDDs encompass over 6.5 million individuals in the US compared to someone without IDD. These individuals are two times more likely to be obese, 2-4 times more likely to be less physically active and more likely to be predisposed to many disease states including, five times more likely to have diabetes (Ptomey & Wittenbrook, 2015). As well, inadequate energy needs or nutrient intake and altered gastrointestional (GI) function can affect nutrition diagnosis and overall health (Ptomey & Wittenbrook, 2015). Often it is recommended that the individual and their caregivers are included in any multi-disciplinary plan of care. Thus the importance for targeting programming directed at **persons with IDDs** and their support system.

Programming Examples for IDDs

Providing programming that meets persons with IDDs is often lacking unless individuals are enrolled in support programming. An example of one such program is part of Special Olympics. Special Olympics mission statement is to:

Provide year-round sports training and athletic competition in a variety of Olympic-type sports for children and adults with intellectual disabilities, giving them continuing opportunities to develop physical fitness, demonstrate courage, experience joy, and participate in a sharing of gifts, skills and friendship with their families, other Special Olympics athletes, and the community (Special Olympics Missouri (SOMO), 2021).

Their program 'Fit 5' supports athletes in achieving fitness, nutrition, and hydration. It aims to improve the athlete's health through focusing on exercising five times per week, eating fruits and vegetables five times per day, and drinking five bottles of water per day over the course of eight weeks. This program is overseen by a health and wellness manager (SOMO, 2021).

A similar model to 'Fit 5' was evaluated in 2006, The Healthy Lifestyle Change Program. (Bozzano et al., 2009). Participants were between the ages of 18–65 years and participating in programming with a community organization serving **persons with IDDs.** Forty-four participants completed the program which was a community-based intervention held over seven months meeting twice-weekly, including 50 minutes of interactive health education with one hour of physical activity. The education and exercise program sought to increase knowledge, skills, and self-efficacy regarding health, nutrition, and fitness and 11 peer mentors (adults with DDs) engaged in the program along participants. Two thirds of participants maintained or lost weight, average BMI decreased and 61 percent of participants reported increased physical activity, while improvements in nutritional habits and self-efficacy were reported (Bozzano, 2009). These programs showcase the importance of overall physical and nutrition education among this population for enhanced behavior change.

One component not provided by the above programs is culinary education. A teaching kitchen concept that meets this audience's needs would allow **persons with IDDs** and their support system, depending on their level of functioning independently, to see connections to the food they eat and ways to prepare it that will meet their health needs. Review of the literature provides some examples of pilot programs, which allows these two topics to be blended.

Nutrition and Culinary Education for IDDs

One pilot study evaluated five **persons with IDDs** and seven homecare support staff. Participants attended a six week interactive pilot program focused on nutrition education and basic cooking skills (Wilneff, 2013). Data was collected through observation video recordings and participant interviews. The two hour class was held for six weeks using Cooking Matters for Families as a model. Nutrition lessons provided increased awareness of healthful eating including weekly preparation of recipes, at-home challenges, and a grocery store tour (Wilneff, 2013). Findings included an increase in nutritional knowledge, cooking skills, new food acceptance, and the key role that caregivers play in the success of the program. This study demonstrated evidence for promotion of healthy behavior changes and increasing knowledge among **persons with IDDs** in a community supported setting.

Another study used the Cooking Matters curriculum with **persons with IDDs** (Barnhart et al., 2019). Data collection methods included semi-structured interviews with pre and post surveys over the course of six months with eight participants along with direct support

professional. These participant dyads noted increased confidence in cooking skills such as knife skills and learning new cooking techniques for uncommon ingredients, such as tofu (Barnhart et al., 2019). Participants had the opportunity to learn new ways to cook on a budget, while working together as a team. This type of program provides space and dialogue around behavior change accountability when the duration and meeting time is extended over a longer period of time (Barnhart et al., 2019).

Nutrition and Culinary Education Programming Considerations

It is important to note some general considerations when developing and executing culinary education programming. Black et al (2019) considered the importance of hands-on in increasing patient confidence for meal planning ahead of time and being able to adapt and adjust recipes and techniques to their individual preference. As important as hands-on intervention is to providing opportunities for behavior change, additional components should be considered including class duration and course length, as well as online opportunities (Wolfson, 2017).

In 2020, these interventions varied and even more communities were instructed to stay at home due to the COVID-19 pandemic. This time highlighted some of the barriers and facilitators to cooking from home, previously seen in one study (Lavalle et al., 2016). These included the cost effectiveness of cooking from home, having a role model or supportive environment in which to cook, understanding basic cooking techniques including short-cuts and having time for prep, cooking, and cleaning up after the meal. During the beginning of the pandemic, in particular, many families and individuals were forced to build confidence in the kitchen by playing around with different ingredients and having recipe fails while using ingredients in a variety of new ways. The confidence and self-efficacy that occurred by engaging in more cooking at home or applying what individual's see others do in the safe environment of their own home kitchen can allow for an increase in behavior change interventions and overall diet quality (Maugeri et al., 2020).

Virtual programs can provide many positive aspects that may not have been seen or noted prior to the shift in learning platforms that occurred in 2020. These programs have potential to improve participation and accountability by decreasing travel-related and scheduling barriers (Varechtchouk, 2020). This study will provide insight into one virtual culinary nutrition teaching kitchen concept conducted as part of a dietetics and health education and promotion Community Health class in Spring 2021 with **persons with IDDs** who are athletes with SOMO.

Methods

Grant monies received from the university's women's giving circle were used as seed money to establish a teaching kitchen opportunity in the university food demonstration lab. During Fall 2020-Spring 2021, undergraduate dietetics and health education and promotion students piloted a teaching kitchen experience with four community partners. One of these partners was SOMO. **Twelve SOMO participants between the ages of 18-27 and the caregivers of three participants, engaged in five 1.5 hour long lessons during spring 2021**. This experience provided the opportunity for insight from SOMO participants on how a teaching kitchen experience assisted them in gaining kitchen confidence, and undergraduate student participants reflections of working with a community partner. It was hypothesized that this experience will allow participants to gain kitchen confidence and an understanding of how to incorporate a variety of food groups into their meals.

Eleven of 16 students enrolled in a 400 level Community Health course hosted culinary nutrition teaching kitchen educations, which were all presented virtually via Zoom. Students providing the lessons were junior or senior level students and had already completed a class on lesson planning and execution, thus had past in –class and/or volunteer experience with planning and conducting educations. Prior to conducting the lessons, students were given an orientation to SOMO, providing an understanding on how to best meet the athlete's needs, and the ability to ask questions to help in developing their lesson. Prior to the execution of the lesson the faculty instructor (also the PI, and noted in text as PI moving forward) teaching the course worked with SOMO staff and undergraduate students to ensure the lesson material was adapted for the given audience.

Lesson plan execution was based on a variety of processes including the importance of including hands-on applications and creating a support system for sustainability of content into the education sessions. This organization allowed for the incorporation of culinary components embedded in the framework of a nutrition education component, that ensured building a life skill of cooking for oneself (Black et al., 2019; Polack et al., 2016). Nutrition education topics were aligned with SOMO's 'Fit 5' program (SOMO, 2021). This execution works best when persons with IDDs have caregiver support that allows for repetition in a home setting (Bazzono et al., 2009).

During the actual lesson, a computer faced towards the students presenting the information and cooking demonstration, so participants could see the students and vice versa. Educations offered provided food and culinary understanding blended with the science of nutrition focusing on evidence-based approaches that met the given population's need. Topics discussed were hydration, recovery fuel for athletes, the importance of a varied plate, eating the rainbow, food safety and knife skills. Recipes provided highlighting the above topics included baked chicken nuggets, yogurt and fruit parfaits, fruit kabobs with yogurt dip, build your own omelets, build your own bowls, spring rolls, and egg roll in a bowl. **Recipe templates and**

grocery lists were provided to participants one week prior to the lesson. The purpose of using templates was to provide ingredient recommendations and substitutions so participants and caregivers could select ingredients that they preferred or wanted to experiment with, though the method of preparation remained similar for each recipe template. Each lesson showed at least two culinary techniques the participants could apply in their kitchen setting.

Data Collection

Data collection methods included surveys and PI and SOMO staff observations. After participation in the lessons, participants received a survey and were asked to respond to the questions and provide general feedback on their teaching kitchen experience. This survey was presented in an online format participants could fill out and responses were submitted directly to the PI. See Table 1 for the survey questions. All participants were mailed a set of measuring spoons and a magnet with cooking temperatures after filling out the survey. Additionally, the PI engaged in participant observation by being present at all lessons and recording notes about how the participants engaged with the students and questions asked throughout the presentation.

As with any data collection method there are advantages and disadvantages. Survey tools can be easy to administer especially when conducted remotely with the given audience, as well as provide an opportunity to collect a broad range of data. They are also cost effective. However, unclear data may be represented if questions are interpreted differently by participants (Hunter, 2012). For purposes of this study, the survey tool was used due to its cost effectiveness and the timeline and virtual options provided for these lessons.

Observations allowed the PI to take notes on the behaviors and activities of the participants in real time. This allowed the PI to have a first-hand experience with the participants

and note aspects of the experience that could not be captured in a survey, which were occurring as part of the engagement between students and participants. The PI was able to focus on passive and active engagement, nonverbal, and general organizational strategies that the students could not take note of while executing their lesson.

Data Analysis

The PI initially coded the survey responses using deductive and inductive coding. Co-researchers, students enrolled in the Community Health class, as well as the community partner liaison reviewed survey responses to ensure and verify the intended meaning of the PI's initial coding allowing for additional dialogue between the PI, co-researchers, and community partner liaison. The survey responses were analyzed qualitatively. The PI developed a codebook which allowed for structure when co-researchers reviewed the survey responses; subcategories were determined by repetition of concepts and were placed under which major code they fit within during data analysis. The major codes were then developed into the themes with supporting ideas and concepts highlighting the subcategories within each theme. Interrater reliability was used between the PI, students, and the community partner in order to ensure agreement was found between each party for assessment of this given population and their teaching kitchen experience. Themes provided initial meaning and understanding surrounding participant's experience of how they built kitchen confidence.

Results

Three themes were identified after reviewing survey results from participants that included gaining understanding around the impact of the curriculum provided during the provided lessons. Over 15 evaluations were received which could have included input from the 12 participants or caregivers more than once. A summary of these findings are found in Table 1. Themes included: Type of activity: The "doing", gaining confidence, and sustainable home meal planning strategies.

Theme #1: Type of Activity: The "Doing"

The actual activity of cooking together was the most enjoyable part of this experience for all participants. Whether it was a new meal idea or culinary technique, it was the "doing" part of it participants noted as their favorite. The act of cooking proteins, rolling spring rolls, or making overnight oats facilitated excitement and a zest for learning various aspects of cooking that were often new to participants. The actual activity was enjoyable for caregivers involved because it allowed them to observe their young adult in the kitchen following along with a recipe and participating in the cooking process. One participant noted, "[He] was so focused on cooking. I feel like he really enjoyed himself and really liked eating it... [the] recipe was simple and tasty." This opportunity allowed caregivers to learn a new technique or observe their young adult gaining culinary knowledge as they assisted them in the kitchen.

Theme #2: Gaining Nutrition and Culinary Confidence

Participants noted the act of learning a new behavior facilitated additional confidence in their abilities in the kitchen and in knowledge about nutrition. The confidence component will be split into culinary specific and nutrition specific. From a culinary standpoint, participants learned more about measuring ingredients, chopping and cutting, roasting, steaming, whisking and rolling a spring roll in particular. They become more comfortable with how to use a knife, how to use basic kitchen equipment, and how to cut vegetables uniformly. They become more aware of kitchen safety, and though a recipe may seem overwhelming to start, it was easy to make when taking one's time. This experience allowed participants additional confidence in their abilities to help their families more in the kitchen and other loved ones especially because as one participant noted, "[I could] see what a dish was supposed to look like and taste like."

The caregivers noted the importance of the skills and techniques their young adult learned during this experience. Watching and cooking alongside their child facilitated an opportunity to see how they could perform in their own kitchen when allowed to do so in a virtual space with peers: "Watching [him] cook the chicken, he looked so confident...he handled it better than I gave him credit. We will work more in the kitchen together." This note in caregiver confidence in their young adult's cooking abilities and navigation of the kitchen allowed one caregiver in particular to consider what they would use from this experience moving forward: "Probably having more engagement with [my son] with food preparation... [I] forgot how well he can handle a knife."

From a nutrition standpoint, participants learned a variety of ways to make their meals more nutritionally balanced. They learned the benefits of the colors of vegetables, how to use vegetables as a substitute in dishes, how to include more color on their plates, and what antioxidants were in their foods. Many participants commented on the importance of considering portioning their foods and being more aware of portion size, as well as ways to decrease their sodium intake. Most importantly, many felt more confident in how to choose healthier food options overall.

Theme #3: Strategies for Meal Planning Success

The last theme highlighted was strategies for meal planning success. Strategies included having all ingredients ready prior to starting cooking, prepping ingredients in advance, and finding ways to cross utilize fruits and vegetables. Participants stated they learned new ways of approaching meal preparation which they would use in the future. It was noted that it was important to plan and grocery shop ahead of time in order to ensure ingredients are available for recipe execution. Participants were provided with the recipe and grocery list so everything was in one place making this part as easy as possible for them.

From a pre-planning standpoint, there was an appreciation around prepping meals such as breakfast the night before, in order to create less work in the morning as with an overnight oats recipe. This same strategy was seen when considering preparing grains in advance, such as rice, to decrease preparation during mealtime. Many participants noted they were able to find ways they could add fruits and vegetables to their meals throughout the day that was easier than in the past. In particular, being able to prepare fruits or vegetables in a given recipe and preparing more than needed for what the recipe calls for allowed participants to use these prepped items in other meals or snacks. This strategy was key to making it easier to find ways to include fruits and vegetables throughout the day.

Other General Planning Considerations and Feedback

Other concepts noted were the interactions and connections participants made with others and the students conducting the lessons. The least favorite parts of the lessons and considerations for next time include: some participants would like to be in person to see the university's kitchens and many would have liked someone to clean up for them! As well participants would have liked to be able to talk more about what each of them were doing throughout the class and in general learn grilling techniques.

SOMO staff observations and off-line conversations with participants were also considered as to how this may impact programming moving forward. SOMO staff were given the opportunity to reflect on the experience via a phone call with the PI and some of the comments included: participants had an overall positive experience and they want more of the classes in the future. They also liked seeing their own name on the screen, which made them feel included in the virtual experience and appreciated the pauses in direction and education by the students every few minutes for all participants to catch up. It was noted by the SOMO staff and PI that the participants gained confidence with a virtual format as the workshops progressed, making it easier for the flow of the content as the lessons progressed.

University Student Impact

One last aspect evaluated to understand impact of the lessons was how the students gained exposure to a teaching kitchen concept and their interactions with their given community partner. Students provided reflections in their final class presentations. Some highlights of these reflections are provided below. Many students noted the impact the pandemic had on educating and engaging with their community partners. They all agreed that the virtual set-up still allowed for an impactful and engaging education and in this process they learned something as well, including what to do differently next time and how to set-up a similar session in the future. Many students recognized that participant engagement may have been altered due to differences in their comfort level with the virtual option provided. However, many noted the increase in comfort level as participants engaged in additional sessions. Students really did enjoy getting to partner with a community group that they had never worked with in the past and thought the orientation session was very helpful in providing context for how to best assist their audience's needs. In general, students appreciated learning how to organize and execute a nutrition and culinary demonstration, and though most were nervous prior to the education they were surprised they knew more than they thought they knew. Overall, they enjoyed teaching others and look forward to additional opportunities in the future.

Discussion

The themes identified provide an opportunity for how findings may be similar and unique among existing literature. As well, this experience provides insight for implications in practice when providing nutrition and culinary education for **persons with IDDs**.

The Activity: Cooking

When reviewing the theme of the actual activity participants engaged in during the virtual experience, it was important to note that this was the most enjoyable part of the experience. It was the act of cooking that brought all participants together in a virtual setting and in cooking together all learned something they could use in the future. The confidence and skills learned allowed participants to feel more comfortable with cooking how to approach it differently in order to make it more doable in the future.

Students allowed the overall cooking experience to look approachable and easy for most participants and it was through this process participants felt comfortable asking questions or clarifications allowing them to succeed. This highlights the importance of how hands-on experiences, such as teaching kitchens, allow engagement that is not able to occur in the same fashion in a lecture format. A similar intervention was seen with a teaching kitchen pilot offered to veterans (Black et al., 2019). This pilot is now a program at over 100 Veteran Affairs sites and showcases the importance of hands-on experiences in increasing participant's' confidence with meal planning while adapting and adjusting recipes to one's preferences. This study with over 2,000 participants provided guided instruction and social opportunities to gain self-efficacy in dietary and cooking habits (Black et al., 2019).

The act of "doing" and working alongside the students and their caregivers allowed participants in this study to enjoy the experience, because they were learning by doing and thus simultaneously building self-efficacy surrounding a life skill – cooking – an activity which space may not always be allowed for daily. The act of cooking and the enjoyment in this experience may have naturally happened in person, though it is important to note that getting to do something at home they could get excited about and participate in when they were in quarantine made this hands-on virtual interaction even more exciting to look forward weekly.

Gaining Confidence

Participants noted the act of learning a new behavior facilitated confidence both in the kitchen and subsequently with their nutrition knowledge. The variety in the lessons and recipes provided by the students allowed participants opportunities to learn many culinary techniques. These techniques may have been used in the past but had not been done correctly or had not been introduced in the past. This experience did not allow students or the PI to fully gain knowledge on how participants navigated themselves in the kitchen or their own personal skill levels given what was seen on the screen for the students was different in each participant's virtual Zoom box. So it was difficult to visualize the varying levels of skills of participants.

It is important to provide a variety within a series of lessons and some variations within the recipe development for varying skill levels among participants. In general, knife skills, understanding using basic kitchen equipment, and increasing a toolbox of culinary techniques provided participants with confidence that was different or more in depth than they experienced in the past. This was seen in one study conducted by Wolfson at al. (2017), including specific activities where participants began to understand and navigate the kitchen, including knife skills, mis en place, and collaborative learning while cooking along. This helped to facilitate behavior change, building a connection between cooking and health. Within this variety providing access to all food groups and a variety of color, allowed culinary and nutrition education to go hand-in-hand in an hour session. Students focused on bits and pieces of nutrition education scattered throughout the lesson, which allowed participants to focus on the cooking piece and not be overwhelmed with the nutrition information. This same technique was showcased in a health promotion approach, where nutrition education accompanied a cooking demonstration and food tasting in a clinic waiting area. By applying nutrition principles to food preparation, the learning experience was transformed into an interesting and palatable opportunity, which met participants where they were waiting for an appointment, and providing a space and time to learn (Goh et al., 2016).

An additional part that may have allowed increased confidence during this experience was the set-up. This learning environment was new to all participants both virtual and cooking with other peers. Working alongside peers and with students that were patient and set an appropriate pace for this audience allowed the opportunity for skill development that resonated with this audience.

The caregivers noted the importance of the skills and techniques their young adult learned during this experience. This same experience may not have occurred in a live in—person session but was able to organically happen using a virtual space. During the in-person organization of this workshop experience prior to the pandemic, caregivers and participants would have been in separate space. In this virtual process, caregivers gave more freedom and independence to their young adult, which in the past they may not have allowed their young adult to help because they did not know what they are capable of or were not provided with such a learning opportunity.

Strategies for Success

The last theme highlighted included strategies for success, which allows opportunities to put what participants learned into sustainable positive change with meal preparation. The most common strategy encapsulated having a plan in place with regard to daily meal planning to help ensure a variety of choices participants could use to cross utilize ingredients. Participants were provided with a recipe and grocery list and this act of "mis en place" (having everything in its place) is key to having success in the kitchen. It allows room for adaptability and flexibility within this framework, which students showcased during their education. If a participant did not like a certain ingredient offering participants the ability to see they could adapt recipes based on what they had available, allowed them to make meal ideas that were unique. This "coloring outside the lines" approach to meal preparation each week, allowed the individuality of each participant's preferences to be shared with the larger group. Students also provided space for tips as to how to use leftovers and ways to cross utilize ingredients. This strategy used by students showed participants how prepping certain ingredients for several different meals can cut down on overall meal preparation for the week. It also began to allow participants an opportunity to become less dependent on recipes and more focused on the functionality of ingredients, building flavor, and balanced meal options they could individualize and enjoy. All of these strategies allowed participants opportunities for time saving elements, which is often a barrier to having success in the kitchen when it comes to planning meals.

Implementations and Limitations

As educators and health professionals consider using data and current literature to support planning for culinary nutrition programming, there are several insights this research provided to assist with programming geared towards IDDs. These include hands-on virtual options, providing culinary focused themes with supporting nutritional information and caregiver support opportunities. As well, limitations of the study will be noted.

Implication #1: Hands-on Virtual Option

It is crucial that a hands-on component is included allowing **persons with IDDs** and their caregivers to navigate the kitchen, while building confidence and offering additional recipes and tools they can use in their meal planning. A hands-on component that is focused on the "doing" aspect of cooking, while engaging all parties in this component is central to the learning experience. Developing a curriculum which focuses on a sampling of culinary techniques across various dishes can allow for a more fully integrated understanding of how these techniques and skills can be used in a variety of ways. Given the nature of the virtual format, all participants were able to cook in their own kitchens and be simultaneously working on the same recipe with different, individualized variations. As planned, these lessons would have been in person and may not have allowed as much hands-on experience due to the number of participants in the kitchen at one time. As well, a new setting and experience may have not allowed participants to engage due to potential discomfort or apprehension with the life skill of cooking. Thus, it is paramount to consider a virtual option in order to engage more participants in the setting of their own kitchen where they will be making the majority of their meals. This also allows individuals that may not have transportation or live too far way to attend to take part in the cooking experience.

Implication #2: Nutrition Education Approach

Another important component when working with the design of the curriculum is to ensure the focus is on the hands-on cooking activity with opportunities for nutrition messaging scattered throughout the session. Lessons provided by the students that were too heavy in nutrition or messaging in the beginning often didn't keep the same flow or rhythm, as when students immediately engaged the participants in the act of cooking. These lessons then allowed participants to get moving in the kitchen and when windows of opportunity arose the students could interject with overall nutrition tidbits aligning with the ingredients they were working with or a cooking technique.

Implication #3: Caregiver Inclusion in Programming Organization

Potential lessons ideally should include a caregiver and non-caregiver supported opportunity. Not all of the participants had caregivers in their kitchen cooking with them; however in an in-person lesson this would allow the instructors and students to gauge where they can best meet the needs of each participant. Including caregivers in some sessions, also allows opportunities for instructors and students to best support caregivers in how they assist and provide additional independence for their young adult in the kitchen, allowing a level of confidence to be met that may have not been achieved in the past.

Limitations

Limitations of this study include the sample size, variations in participant engagement, decreased response rate to the survey and data collection methods chosen. Given this was an inaugural program, a small sample was chosen. However, in the future conducting a similar lesson series with larger groups and other organizations supporting **persons with IDDs** would provide additional robust data. With the virtual method, individuals participated at varying levels due to caregiver kitchen support or wanting to watch recordings later and follow at their own pace. Though the virtual option has positive implications, there is no way to be sure participants understood and applied the material if executing the lesson at a later time. As well, this cohort of participants is not representative of the entire population of persons with IDDs. Twenty-five percent of participants had additional assistance with activities of daily living provided by their given support system, so the majority of this cohort was highly functioning. Results may have been different depending on the level of functioning of the participants. As well, by participants engaging in these classes the students helped to provide and develop comfort and confidence in the kitchen, allowing the caregiver to see the true ability of the participant in the kitchen. For groups that may be at a lower functioning capability, ensuring a caregiver or peer mentor is available for assistance is key.

Due to the way the survey was presented, some participants did not complete it. In the future, researchers would provide time at the end of a lesson for submission of the survey or provide a paper copy in an in person session. Finally, a survey tool and observation were the data collection methods chosen. As with any data collection methods there are advantages and disadvantages noted. In the future, conducting a focus group post education session or individual interview opportunities may provide additional data that would be useful in exploring participants and caregivers experiences with a teaching kitchen concept.

Conclusion

It is important to include an opportunity for culinary education in programming developed for **persons with IDDs**. It does not need to be fancy or elaborate but simple, adaptable recipes and cooking techniques that the whole family can benefit from over time. The act of cooking and engagement that comes with this hands-on activity allows **persons with IDDs** to challenge themselves, be curious, learn new ways of doing meal preparation and have fun, while sharing experiences with their family and connecting with others.

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Sample Questions	Common Responses
Did this program meet your expectations?	• Yes for all
What was your favorite part of the class?	 Cooking Learning something new Seeing what the dish looked like and tasted like
What was your least favorite part of the class?	 Not being in person Spring roll wrappers – texture and process Cleaning up the mess
Were the university student instructors helpful?	• Yes for all
What will you use in your own life from this experience moving forward?	 Adding color via vegetables and fruits to meals Building confidence in skills to help others in my family with meal preparation Different culinary techniques
What culinary skills did you learn?	 Portioning and measuring Chopping and cutting Roasting Steaming Whisking Rolling a spring roll wrapper
What do you feel more confident about as a skill in the kitchen?	 Cutting different vegetables and fruit Using a knife and expanding knife skills Being able to adapt a recipe
What nutrition information did you learn that you did not know?	 Portion control Adding color to your meals How to choose healthier options
How did this experience assist with any meal planning strategies?	 How to prepare items ahead of time to time during meal preparation Recipes provided were easy to follow and can do them again

	• Using ingredients in different ways to help with meal preparation
What suggestions do you have for other classes that are offered?	 Grilling items Make more whole grains
	More cooking
	 Talk more about what we were doing while doing it
Share anything else that you think will be helpful.	 The instructors were patient The recipe was delicious
L	 Hope to have other classes in the future