EDUCATIONAL CASE REPORT

Food4Thought: a Medical Trainee–Led, Remotely Delivered Nutrition Outreach Program for Individuals with Serious Mental Illness

Amy Cheung1 · Pooja Dutta1 · Yumi Kovic2 · Marko Stojcevski1 · Xiaoduo Fan1

Received: 10 June 2022 / Accepted: 10 November 2022 / Published online: 29 November 2022
© The Author(s), under exclusive licence to American Association of Chairs of Departments of Psychiatry, American Association of Directors of Psychiatric Residency Training, Association for Academic Psychiatry and Association of Directors of Medical Student Education in Psychiatry 2022

People with serious mental illness (SMI), such as those with a schizophrenia spectrum disorder, bipolar disorder, or major depressive disorder, are highly susceptible to medical comorbidities. Cardiovascular disease (CVD) is the leading cause of premature death in this population and has been attributed to several factors including obesity, smoking, and lifestyle behaviors [1–4]. Among them, suboptimal diet is an important and modifiable contributor to poor cardiometabolic health. Culinary medicine and nutritional psychiatry are growing fields that explore the relationship between food and personal and mental health, respectively [5]. As of 2016, more than ten medical schools in the USA have adopted culinary medicine curricula to educate rising physicians about the integration of eating behaviors with the health care goals of patients [6, 7]. Diet modification programs have been shown to improve symptoms of depression [8, 9] and bipolar disorder [10], suggesting the potential mental health benefit of such interventions [11].

We present Food4Thought, a virtual nutrition outreach program for community members with SMI and staff that support them at a community mental health agency. The program followed the community participatory model which promotes community-academic collaborations to ensure program content is relevant and meaningful [12, 13]. The goals of our initiative were to evaluate the feasibility and potential benefit of Food4Thought and provide an opportunity for medical trainees to develop a public health intervention program.

Program Development and Evaluation

The Food4Thought program was crafted as an educational collaboration between the Community Intervention Program (CIP) at UMass Chan Medical School and Genesis Club, a non-profit clubhouse that utilizes a person-centered approach to support the recovery of people with mental illness in the Greater Worcester Region of Massachusetts. CIP is a community outreach initiative led by medical students and psychiatry residents and supported by UMass MIND research employees and volunteers. The Healthy Living initiative within CIP aims to promote lifestyle behaviors in the SMI population. In partnership with the Genesis Club kitchen unit, three medical students and one psychiatry resident within the Healthy Living team designed the program under the advisement of an attending psychiatrist and a registered dietitian. Additional medical trainees joined to help prepare materials and lead sessions. For this paper, “participants” refer to Genesis Club members with SMI and staff and “facilitators” refer to individuals from the CIP Healthy Living team. The UMass Chan Medical School IRB determined that the Food4Thought program was not research involving human subjects.

The program was administered through the HIPAA-compliant Zoom platform and advertised via flyers posted within the clubhouse and email through the Genesis Club listserv. A remote format was chosen in response to the shift in virtual care delivery during the COVID-19 pandemic. First, three medical students and a psychiatry resident facilitated a Listening & Informational session open to all clubhouse members and staff to gather their perspectives on lifestyle programming and brainstorm topics of interest. Following this session, participants completed a survey about preferred learning modalities. Enrollment was capped at twelve participants set by Genesis Club based on their ability to fund ingredients. The first program comprised three modules with each module containing an educational session and kitchen skills session. Each session lasted 1 h and was
led by a medical student. Educational sessions consisted of 30–40 min of a slide presentation with group discussion. Prior to each kitchen skills session, participants picked up their recipe and ingredient package at Genesis Club. Participants used their own kitchen equipment in their homes. The lead medical student provided recipe instructions while simultaneously preparing the meal. Each module was separated by two weeks to provide time for facilitators to prepare materials. Surveys with 4- or 5-point Likert scales (1 = strongly disagree, 4 or 5 = strongly agree) were delivered after each module to assess thoughts on and motivation for healthy eating. A second Listening & Informational session was held 1 week after the completion of the program to allow participants and facilitators to reflect on the experience. Those who attended at least one module of the program were asked to complete a final survey which included questions for future program improvement.

A second Food4Thought program was again open to all Genesis Club members and staff and closely followed the format of the first program: first Listening & Informational session, four two-part modules, and second Listening & Informational session. Each session was separated by 1 week. Using a hybrid approach, participants with SMI had the option to work together with staff participants at the Genesis Club kitchen to prepare the recipe(s). A survey using 5-point Likert scales was administered following the first and second Listening & Informational sessions to evaluate nutrition knowledge and attitudes toward the effect of food on health. No surveys were provided after each module to reduce respondent fatigue.

The second Listening & Informational session of the first program and the entire second program were recorded with participant consent. The audio was transcribed, and representative quotes were excerpted. Medical trainees who participated in the program and were not involved in the writing of this report were asked to complete a survey including 5-point Likert scales of their experience as program facilitators.

Program Results

Twelve individuals from Genesis Club attended the first Listening & Informational session of the launch program. An overview of the program is described in Table 1. Nutritional Psychiatry, Mindful Eating, and Cooking Healthy on a Budget were chosen by the facilitators and Genesis Club kitchen unit as topics based on feedback. From the survey responses (n = 10), participants preferred materials to be presented as informational videos, PowerPoint presentations, and small-group discussion. Selected recipes were inspired by meals already served at the clubhouse and the module theme. For example, a multi-component meal was chosen for Mindful Eating to allow participants to practice mindful eating principles with foods of various flavors and textures. Module-specific survey response rates of participants who attended either the educational or kitchen skill sessions were 42% (5 respondents/12 participants), 50% (5/10), and 100% (8/8), respectively. Ten of the twelve participants attended at least four of the six total sessions across the three modules. In all post-module surveys, all participants strongly agreed or agreed that “I am confident I can make changes in my everyday diet” and “Nutritious meals can taste good too.” In the second Listening & Informational session, participants (n = 8) discussed lessons learned during the program and challenges to eat healthier including easy access to unhealthy foods. One participant noted that they learned to think about “more than just food groups… [but also] think colors” when choosing foods with different nutrients. In the final survey provided after this session, participants (n = 8) expressed their preference for the virtual format and additional module topics.

The second program incorporated feedback from the first program. Twelve Genesis Club members and staff attended the first Listening & Informational session. The module topics were expanded to Food, Mind, and Body (Module 1), Cooking Healthy on a Budget (Module 2), Mindful Eating (Module 3), and Food as Medicine (Module 4) (Table 1). Module-specific attendance of participants who attended either the educational or kitchen skills sessions was twelve, ten, nine, and nine, respectively. Ten of the twelve participants attended at least five of the eight total sessions. During the second Listening & Informational session, participants (n = 5) discussed their relationships with their SMI and food. One participant stated “My mind interacts with my belly. Since I have schizophrenia, my appetite changes during the meal.” Others commented on the benefits of digital technologies to maintain their social connections and reduce anxiety of meeting in person. Seven participants completed both pre- and post-program surveys. No statistically significant changes in knowledge and attitudes surrounding healthy eating behaviors were observed; however, there was a trend for “The foods I eat can affect my mood” (p = 0.10, paired t test) (Table 2).

Four medical trainee facilitators (three medical students and one psychiatry resident) completed the post-program survey. One survey respondent commented “while discussing and sharing healthy food habits, I was able to significantly improve my own.” Another facilitator noted the importance of continuing a hybrid model to directly assist participants who may have challenges with cooking during kitchen skills sessions. All medical student respondents “strongly agree” that community-based programs should be part of the medical education curriculum.
Table 1  Objectives of the nutrition outreach program

| Module | Objective | Meal prepared* |
|--------|-----------|----------------|
| First iteration of Food4Thought | | |
| 1: Nutritional psychiatry | Learn about the connection between diet and mood | Beef and cheese tostadas |
| | Learn about foods that contain antioxidants and anti-inflammatory properties | |
| | Understand the concept of MyPlate with a clinical dietician | |
| 2: Mindful eating | Understand the concept of mindfulness and how it relates to healthy eating | “Breakfast for dinner” (yogurt-berry parfait, sausage-egg scramble, and apple cinnamon toast) |
| | Understand how to use mindfulness to build awareness around food choices and hunger | |
| | Learn how to apply a hunger scale to eat mindfully | |
| 3: Cooking healthy on a budget | Learn tips to save money while grocery shopping | One-pot Thai chicken curry |
| | Understand how to shop smart and meal prep | |
| | Reinforce budget-friendly cooking within the context of MyPlate with a clinical dietician | |
| Second iteration of Food4Thought | | |
| 1: Food, mind, and body | Understand the impact of food on physical health | Beef and cheese tostadas |
| | Learn about concepts in nutritional psychiatry covered in the first program | |
| 2: Cooking healthy on a budget | Learn tips to save money while grocery shopping | One-pot Thai chicken curry |
| | Understand how to shop smart and meal prep | |
| | Reinforce budget-friendly cooking within the context of MyPlate with a clinical dietician | |
| 3: Mindful eating | Understand the concept of mindfulness and how it relates to healthy eating | “Breakfast for dinner” (tofu scramble, chocolate baked oats) |
| | Understand how to use mindfulness to build awareness around food choices and hunger | |
| | Learn how to apply a hunger scale to eat mindfully | |
| 4: Food as medicine | Learn about vitamins and nutrients in food | Mediterranean-inspired quinoa salad |
| | Understand the impact of the microbiome on overall health | |
| | Understand the side effects of psychiatric medications and their effect on physical health | |

*All meals were able to be modified with protein substitutes as preferred by participants

Table 2  Summary of pre- and post-program survey results from the second Food4Thought program

| | Pre-program Mean (SD)* | Post-program Mean (SD) | p value |
|----------------------|-------------------------|-------------------------|---------|
| I am motivated to discuss the effects of my medications with my doctor | 4.0 (1.2) | 3.9 (1.2) | >0.05 |
| I am concerned about the impact of medications on my weight | 3.7 (1.5) | 3.3 (1.9) | >0.05 |
| It is important to pay attention to how food makes me feel while eating | 4.4 (0.5) | 4.4 (0.5) | >0.05 |
| I check the nutrition label of the food I am eating | 2.9 (0.9) | 3.3 (1.0) | >0.05 |
| I think about how hungry or full I am before eating | 3.1 (1.1) | 3.7 (0.5) | 0.17 |
| The foods I eat can affect my physical function | 4.3 (1.1) | 4.1 (0.7) | >0.05 |
| The foods I eat can affect my mood | 3.9 (1.1) | 4.4 (0.5) | 0.10 |

*Each question was assigned on a 5-point Likert scale of strength of agreement response (from 1 = strongly disagree to 5 = strongly agree). Seven participants completed both surveys. No pre-post-program results were collected in the first program.
Interpretation of Program Findings

The remotely delivered Food4Thought program was well-received by participants. The feasibility of our program can be attributed to the open exchange of ideas between the CIP Healthy Living team and Genesis Club during its development. The first Listening & Informational session was critical in forming an alliance with the community-based partner. The virtual format was feasible and allowed both facilitators and participants to easily sign onto sessions in their own homes or the Genesis Club kitchen, encouraging equitable access to nutrition support. Participants also received teachings from a clinical dietician who helped develop the recipes and materials used in the program.

Several limitations of the program are apparent. The small number of participants and facilitators in the program may not reflect the overall attitudes of individuals with SMI or medical trainees, respectively. No statistical differences were observed in the pre-post program survey in the second program, which may have been impacted by the small sample size of the participants. People with SMI who do not have access to or require education on the use of digital technologies as well as kitchen space will have more difficulty participating in the program [14, 15].

Reflections on Academic-Community Partnerships

Food4Thought used the community participatory model to recognize identities and strengths within the community, build on existing resources, and attain a balance between research and action [16–18]. After the program, the Genesis Club kitchen unit changed and expanded their menu to include more culturally varied and vegetarian meals. Printouts of visual aids used during the program were placed in the kitchen and dining area to reinforce information and skills learned in the program. These discernible changes demonstrate how nutrition knowledge can be transported from an academic to community setting supporting individuals with SMI.

Implications for Medical Education

Remote delivery of Food4Thought allowed medical trainees to directly interact with individuals with SMI and better understand their attitudes around and challenges to eating healthier. Medical trainees had the opportunity to engage community partners and develop a public health intervention program to serve one of the most vulnerable populations in our society. We hope our experience encourages more medical trainees to be involved in similar endeavors, which could be an important part of the medical education curriculum.

Data Availability  The data that support the findings of this study are available on request from the corresponding author.

Disclosures

X F has received research support from Alkermes, Janssen, Otsuka, Roche, Lundbeck, Avarin, and Boehringer Ingelheim. XF serves on the PCORI Advisory Panel on Healthcare Delivery and Disparities Research, and the Data and Safety Monitoring Board for Northwell Health/The Zucker Hillside Hospital. In addition, XF holds a patent on “Combination Treatment for Neuropsychiatric Disorders” (USPTO Patent No. 11,331,319).

YK has received compensation from ScholarRx.

The other authors declare no conflict of interest.

References

1. Rossom RC, Hooker SA, O’Connor PJ, Crain AL, Sperl-Hillen JM. Cardiovascular risk for patients with and without schizophrenia, schizoaffective disorder, or bipolar disorder. J Am Heart Assoc. 2022;11(6): e021444.
2. Daumit GL, Dalcin AT, Dickerson FB, Miller ER, Evins AE, Cather C, et al. Effect of a comprehensive cardiovascular risk reduction intervention in persons with serious mental illness: a randomized clinical trial. JAMA Netw Open. 2020;3(6): e207247.
3. Nordentoft M, Wahlbeck K, Hallgren J, Westman J, Oshy U, Ali-naghizadeh H, et al. Excess mortality, causes of death and life expectancy in 270,770 patients with recent onset of mental disorders in Denmark, Finland and Sweden. PLoS ONE. 2013;8(1): e55176.
4. Teasdale SB, Ward PB, Samaras K, Firth J, Stubbs B, Tripodi E, et al. Dietary intake of people with severe mental illness: systematic review and meta-analysis. Br J Psychiatry. 2019;214(5):251–9.
5. Marx W, Moseley G, Berk M, Jacka F. Nutritional psychiatry: the present state of the evidence. Proc Nutr Soc. 2017;76(4):427–36.
6. La Puma J. What is culinary medicine and what does it do? Popul Health Manag. 2016;19(1):1–3.
7. Monlezun DJ, Kasprowicz E, Tosh KW, Nix J, Urdy P, Tice D, et al. Medical school-based teaching kitchen improves HbA1c, blood pressure, and cholesterol for patients with type 2 diabetes: results from a novel randomized controlled trial. Diabetes Res Clin Pract. 2015;109(2):420–6.
8. Jacka FN, O’Neil A, Opie R, Itsiopoulos C, Cotton S, Mohebbi M, et al. A randomised controlled trial of dietary improvement for adults with major depression (the “SMILES” trial). BMC Med. 2017;15(1):23.
9. Francis HM, Stevenson RJ, Chambers JR, Gupta D, Newey B, Lim CK. A brief diet intervention can reduce symptoms of depression in young adults—a randomised controlled trial. PLoS ONE. 2019;14(10): e022768.
10. Saunders EFH, Mukherjee D, Myers T, Wasserman E, Hameed A, Bassappa Krishnamurthy V, et al. Adjunctive dietary intervention for bipolar disorder: a randomized, controlled, parallel-group, modified double-blinded trial of a high n-3 plus low n-6 diet. Bipolar Disord. 2022;24(2):171–84.
11. Clark A, Bezyak J, Testerman N. Individuals with severe mental illnesses have improved eating behaviors and cooking skills after attending a 6-week nutrition cooking class. Psychiatr Rehabil J. 2015;38(3):276–8.

12. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. Annu Rev Public Health. 1998;19:173–202.

13. Lincoln AK, Borg R, Delman J. Developing a community-based participatory research model to engage transition age youth using mental health service in research. Fam Community Health. 2015;38(1):87–97.

14. Young AS, Cohen AN, Niv N, Nowlin-Finch N, Oberman RS, Olmos-Ochoa TT, et al. Mobile phone and smartphone use by people with serious mental illness. Psychiatr Serv. 2020;71(3):280–3.

15. Barre LK, Ferron JC, Davis KE, Whitley R. Healthy eating in persons with serious mental illnesses: understanding and barriers. Psychiatr Rehabil J. 2011;34(4):304–10.

16. Holkup PA, Tripp-Reimer T, Salois EM, Weinert C. Community-based participatory research: an approach to intervention research with a Native American community. ANS Adv Nurs Sci. 2004;27(3):162–75.

17. Agenor M, Qureshi F, Johnson K, Kacevich S, McAdams-Mahmoud A, Curlin J. Developing a community-academic partnership to promote mental health among underserved preadolescent girls in Boston. Massachusetts Prog Community Health Partnersh. 2018;12(3):321–8.

18. Mullins CD, Wingate LT, Edwards HA, Tofade T, Wutoh A. Transitioning from learning healthcare systems to learning health care communities. J Comp Eff Res. 2018;7(6):603–14.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.