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Culinary Medicine: An Evaluation to Assess the Knowledge, Attitudes, Behaviors and Confidence of 1st Year Medical Students in a Culinary Medicine Teaching Kitchen

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CULINARY MEDICINE: AN EVALUATION TO ASSESS THE KNOWLEDGE, ATTITUDES, BEHAVIORS AND CONFIDENCE OF 1ST YEAR MEDICAL STUDENTS IN A CULINARY MEDICINE TEACHING KITCHEN

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
Food, Nutrition, and Culinary Sciences

by
Lauren Elizabeth Vanderpool
May 2019

Accepted by:
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ABSTRACT

The World Health Organization predicts that two-thirds of all disease around the globe will be the result of lifestyle choices by the year 2020. Increasing obesity rates contribute to these climbing numbers. The direct relation between obesity and comorbidities such as cardiovascular disease (CVD), Type II Diabetes, and hypertension cannot be denied. Obesity is directly associated with higher risks of developing CVD, Type II Diabetes, hypertension, and many other health conditions. All of the aforementioned health conditions are associated with physical activity, nutrition and other lifestyle behaviors. In order to combat these extremely prevalent health conditions, it is ideal to prevent these conditions before they ever occur.

The practice of preventive medicine and lifestyle medicine are becoming more common. However, it is nationally recognized that the U.S. healthcare curricula does not currently teach healthcare providers the necessary knowledge required for exercise and nutrition competencies. In response to this deficit in the medical education curriculum, programs such as the Goldring Center for Culinary Medicine (GCCM) at Tulane University School of Medicine are becoming increasingly popular. At this point, over fifty medical schools have implemented the GCCM program into their curriculum. Many lifestyle medicine, preventive medicine, culinary medicine and culinary nutrition programs are effectively helping healthcare providers and patients adopt healthier lifestyles.
DEDICATION

To my family, especially, John Mark, mom, dad, Lexi, and Stuart, you have all supported me with much patience, kindness, and love. Your encouragement means more than you know. I love each of you dearly.
ACKNOWLEDGMENTS

The work presented in this project is a reflection of the involvement of many individuals of whom I am so grateful for. Dr. Condrasky: thank you for being such an influential and impactful professor, advisor, and mentor to me for the past two years. Thank you for your passionate desire to make an impact and implement change in the community. Your zeal is contagious. Thank you. To my thesis committee: Dr. Bridges, Dr. Corbett, Dr. Griffin, and Dr. Haley, thank you for your involvement, advice, and expertise throughout this process. Each one of you contributed in such an inspirational manner to this project. I sincerely appreciate the unique expertise each of you contributed to this thesis. Thank you. Dr. Trilk: Without your impassioned efforts to increase the impact of lifestyle medicine, none of this would be possible. Thank you for all of your hard work and contributions to making this culinary medicine program a reality. Chef Scott: Your culinary knowledge and skills are incredible. Without you, this culinary medicine class would have been entirely incomplete. Thank you so much for your interest in health and wellness and your willingness to teach in such an inspiring manner. To the medical students who participated in this study, you are the focal point of this project. Thank you for your desire to change lives and treat disease through the lens of lifestyle medicine and preventive medicine measures. I have the upmost respect for your current efforts and your futures ahead. Best wishes to each of you. There are a number of other individuals and organizations whom have made this thesis project a reality: Chef Alan Scheidhauer, Christine
Gerrard, Casey Wiley, Greenville Technical College, and the University of South Carolina School of Medicine Greenville. Thank you.
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CHAPTER ONE
REVIEW OF CURRENT LITERATURE

Introduction

The intent of this research project is to review the delivery of the 2018 Summer culinary medicine pilot study curriculum at the University of South Carolina School of Medicine Greenville (USCSOMG). The general aim is to determine the effectiveness of the program in relation to student knowledge, attitudes, skills, behaviors, cooking confidence and self-efficacy pertaining to culinary medicine. The primary aim of this project is to assess the culinary medicine knowledge, attitudes, skills, behaviors, cooking confidence and self-efficacy of the five medical students participating in this culinary medicine pilot course. The secondary aim is to assess each module of this culinary medicine pilot course by observing student engagement and overall efficiency and effectiveness of the course. The tertiary aim is to evaluate student feedback and satisfaction of the culinary medicine pilot course.

The implementation of this culinary medicine program at the USCSOMG was funded by a Healthy Greenville 2036 grant. Summer of 2018 was the first time this culinary medicine curriculum was offered to students at the USCSOMG. Currently, the culinary medicine course is only offered to USCSOMG students whom are part of the lifestyle medicine distinction track. The goal is to eventually offer this course to USCSOMG students outside of the lifestyle medicine distinction track as an elective. The following review of current literature supports
the importance of such culinary medicine programs and their impact on students, healthcare providers, and patients.

**Nutrition Education in Healthcare**

The World Health Organization predicts that two-thirds of all disease around the globe will be the result of lifestyle choices by the year 2020. Increasing obesity rates contribute to these climbing numbers. The direct relation between obesity and comorbidities such as cardiovascular disease (CVD), Diabetes Mellitus Type II (T2DM), and hypertension cannot be denied. Obesity is directly associated with higher risks of developing CVD, T2DM, hypertension, and many other health conditions. All of the aforementioned health conditions are associated with physical activity, nutrition and other lifestyle behaviors.

“In the United States, the primary cause of premature adult deaths are related to unhealthy behaviors, such as tobacco use (18.1%) and poor diet and lack of physical activity (15.2%). These findings are widely accepted, and well-established chronic disease practice guidelines uniformly call for behavior change as the first line of prevention and management”. In order to combat these extremely prevalent health conditions, it is ideal to prevent these conditions before they ever occur. The practice of preventive medicine and lifestyle medicine are becoming more common. However, it is nationally recognized that the United States healthcare curricula does not currently teach healthcare
providers the necessary knowledge required for exercise and nutrition competencies.

The American Medical Association House of Delegates agree with The Bipartisan Policy Center that the topics of nutrition and physical activity must be improved in medical education. The Bipartisan Policy Center states that topics such as nutrition and physical activity that have an important role to play in the prevention and treatment of obesity and chronic diseases... have traditionally received little attention in formal medical school curricula. Another source acknowledges the importance of nutrition along with its endorsements from federal policies such as the Protection and Affordable Care Act of 2010 and the Health Information Technology for Economic and Clinical Health Act of 2009. However, this article also states that although the importance of nutrition may be acknowledged, the education and training needed to effectively influence patient care within and between disciplines is lacking. “There is compelling evidence that physicians’ health matters and that physicians’ personal [physical activity] practices influence their clinical [physical activity] attitudes and practices”. Lobelo goes on to mention that interventions are needed to encourage medical students to “adopt and maintain regular physical activity habits to increase the rates and quality of future physician-delivered [physical activity] counseling”. “A lack of formal [lifestyle medicine] education at the medical school level was recognized as early as 1975. A survey revealed that only 16% of medical schools offered a course with information specific to exercise as a part of
preventive medicine. With regard to nutrition, a survey conducted in 1985 by the National Academy of Sciences found that only 27% of medical schools had a separate, required nutrition course, and subsequent surveys showed little improvement.\(^2\) In response to these findings, groups such as preventive medicine and lifestyle medicine are becoming increasingly impactful in the realm of education and healthcare.

**Lifestyle Medicine**

The American College of Lifestyle Medicine (ACLM) defines lifestyle medicine as the evidence-based practice of helping individuals and families adopt and sustain healthy behaviors that affect health and quality of life.\(^7\) Lifestyle medicine targets patient behaviors such as eliminating the use of tobacco, improving quality of diet, increasing physical activity, and moderating alcohol consumption.\(^7\) ACMF focuses on whole food and plant-based diets, regular physical activity, adequate sleep, stress management, avoidance of drugs and tobacco, and moderation of alcohol to “prevent, treat, and oftentimes, reverse the lifestyle-related, chronic disease[s] that [are] all too prevalent”.\(^7\)

Studies have shown that physicians often do not follow the recommendations of lifestyle medicine. “A recent survey found that only 30% of US health professionals provided exercise counseling during the prior 12 months. Barriers include lack of time, compensation, knowledge, and resources… One of the gaps identified for the lack of prescribing [lifestyle medicine] was a dearth in
training; therefore, [lifestyle medicine] medical education was proposed as a necessary solution”.2

Figure 1  Lifestyle Medicine Education Continuum.2

The implementation of lifestyle medicine curricula in the past decades include competencies such as nutrition, exercise, and behavioral change. “However, limited curricula include an integrated approach of a varied spectrum of [lifestyle medicine] topics such as nutrition and exercise, together with behavioral change counseling”.2

In efforts to improve current lifestyle medicine programs and implement new programs, the Lifestyle Medicine Education (LMEd) Collaborative was founded in September 2013.8 The LMEd organization focuses on “expanding access to lifestyle medicine education in U.S. medical schools with a concentration on subjects specifically tailored for medical students. These subjects include exercise/physical activity, nutrition, behavior change, and self-
care”. LMed acknowledges the role of physicians in chronic disease management and prevention. “However, in order to provide truly beneficial patient education, our nation’s physicians must understand the vital roles exercise, nutrition and other lifestyle interventions play in preventing, treating and managing disease. This can be a challenge as today’s medical school curriculum rarely includes exercise and nutrition education or lifestyle medicine education”.

In addition to the Lifestyle Medicine Education Collaborative, the American College of Preventive Medicine (ACPM) is also promoting a Lifestyle Medicine Initiative. ACPM states lifestyle medicine is a scientific approach to decreasing disease risk and illness burden by utilizing lifestyle interventions such as nutrition, physical activity, stress reduction, rest, smoking cessation, and avoidance of alcohol abuse. ACPM acknowledges that lifestyle medicine is the recommended foundational approach to preventing and treating many chronic diseases. ACPM believes lifestyle medicine is a core competency of preventive medicine and supports continued exploration of the scientific basis, best practices, and need for education in lifestyle medicine. “As the discipline continues to mature, ACPM and key stakeholders will play an important role in ensuring lifestyle medicine practices and programs are based on proven and effective methods of preventing and controlling disease”.

There is now an official lifestyle medicine certification for physicians and other health professionals through the American Board of Lifestyle Medicine (ABLM). The ABLM exists to standardize the language for lifestyle medicine
protocols across the globe. The ABLM is also making efforts to “attract health insurance funding for evidence based lifestyle medicine (by requiring that any fund receivers be formally certified”).

**Culinary Nutrition & Culinary Medicine Programs**

“Over the past 35 years, a new enthusiasm has emerged about the relationship of food, eating, and cooking to personal health and wellness”. Due to increasing interest, culinary nutrition and culinary medicine programs are becoming more common in the world of education, public health, and healthcare. Puma explains “culinary medicine is a new evidence-based field in medicine that blends the art of food and cooking with the science of medicine. Culinary medicine is aimed at helping people reach good personal medical decisions about accessing and eating high-quality meals that help prevent and treat disease and restore well-being.”

Culinary nutrition and culinary medicine programs focus on the importance of culinary skills and knowledge in conjunction with nutrition, health, and wellness. Often times, these programs are taught in a teaching kitchen setting to give the participants a greater understanding through hands-on learning techniques. Programs such as The Teaching Kitchen Collaborative, Culinary Nutrition at Johnson & Wales University, Food Matters for Doctors, and the Goldring Center for Culinary Medicine are currently paving the way in this field of study.
“The Teaching Kitchen Collaborative (TKC) is a dynamic, action-oriented network of thought-leading organizations with existing and/or planned teaching kitchens that are capable of shaping next-generation strategy and collaborative research on best practices for integrative lifestyle transformation across settings”.\textsuperscript{12} TKC strives to “[enhance] personal and public health across medical, corporate, school and community settings”.\textsuperscript{12} “In 2006, The Culinary Institute of America (CIA) and Harvard T.H. Chan School of Public Health – Department of Nutrition (HChan), launched the Healthy Kitchens, Healthy Lives conference… to provide medical professionals with state of the science updates relating to nutrition science, exercise and movement, mindfulness, and health coaching”.\textsuperscript{12} As the Healthy Kitchens, Healthy Lives conference has grown and evolved, the idea of the TKC emerged in 2016. The launch of TKC was driven by the fact that “32\% of registrants in 2014 and 38\% of registrants in 2015 built or would soon build teaching kitchens in their respective organizations. However, each teaching kitchen facility and its respective curricula were being designed, funded, implemented, and piloted largely in isolation; none were aware of the full set of insights, innovations, successes, and failures of the others”.\textsuperscript{12}

The Culinary Nutrition program at Johnson & Wales University (JWU) provides an option for JWU culinary students. This is a bachelor of science program that aims to provide its culinary students with “the foundational knowledge to make nutritious food taste great”.\textsuperscript{13} This program teaches students “culinary fundamentals, applied nutrition, life span nutrition, [and] specialized
nutrition…. focusing on improving the way people eat”. This program successfully prepares its students to work in the areas of sports nutrition, healthcare facilities, schools, and restaurants.

“The course, ‘Food Matters for Doctors’, was co-designed by an internal medicine pediatrics physician and a professional chef and public health educator, both of whom have teaching appointments at the University of Minnesota”. The impetus for designing this course was motivated by the idea that “without practical knowledge about food, future physicians will lack vital skills for self- and patient care”. The Food Matters for Doctors pilot course operated from January to March of 2016 and was funded by the American Academy of Pediatrics Section on Integrative Medicine. The pilot group consisted of 18 medical students from the University of Minnesota medical school. “The course consisted of six three-hour sessions, during which students learned practical information about relevant topics and gained hands-on experience in a kitchen”. The course focused on topics such as “lifestyle medicine, mindful eating, the Standard American Diet (SAD), the U.S. Department of Agriculture’s nutrition guide (MyPlate), the gut microbiome and pre- and probiotics, and inflammation as a precursor to chronic disease”.

The American College of Preventive Medicine (ACPM) also provides a number of culinary medicine resources to patients and clinicians. ACPM states “culinary medicine is the practice of helping patients use nutrition and good cooking habits to restore and maintain health”. ACPM acknowledges this is “a
new field that combines important scientific principles related to nutrition, behavior and medicine”. A number of recipes with related videos can be found on the ACPM website under “Culinary Medicine – Resources for Patients and Clinicians”. The ACPM also has videos on their website explaining “how culinary medicine as a self-care tool can be implemented at the practitioner level and practiced by patients to improve health outcomes”. These videos include topics on the time challenges of cooking at home, making healthy foods tasty, and expanding cooking skills. The ACPM also offers a culinary medicine elective course as continuing medical education (CME) credits for physicians. “The culinary medicine elective (1.5 CME) provides a food is medicine perspective with a focus on practical aspects of what patients face day-to-day when trying to make substantive lifestyle changes. The emphasis is on provider education that seeks to incorporate self-care while counseling and empowering patients to make and sustain healthier food choices through shopping and meal preparation”. This elective course aims to encourage practitioners to implement the ideas of culinary medicine in their own lives to increase the likelihood that they will prescribe culinary medicine to their patients. The elective course also reviews the “comprehensive knowledge of nutrition and the culinary techniques to prepare food that is consistent with low income to moderate budgets, time constraints, and nutritional ideas related to high fiber plant based diets”.16

Tulane University has created the Goldring Center for Culinary Medicine (GCGM). GCCM serves as a program to teach healthcare professionals
(physicians, medical students, registered nurses, nurse practitioners, pharmacists, registered dietitians, and certified diabetes educators) the importance of nutrition and culinary skills in relation to overall human health. The GCCM has also developed a Culinary Medicine curriculum, Health Meets Food, for medical schools to implement into their medical education curriculum and a program for healthcare providers to teach to the community.

The creation of GCCM was prompted by “epidemic rates of diabetes and obesity in the United States, and simultaneous medical breakthroughs in the science of nutrition”. New Orleans leads the United States in adult obesity rates and related complications. Therefore, the faculty at Tulane University Medical School thought this was the ideal location to “develop and implement both a curriculum and a program to foster better understanding of the intersection of good food and good health”. The Health Meets Food program has coupled “a curriculum based on basic science with clinical education… the center teaches physicians and other medical professionals how to incorporate dietary intervention strategies into the practice of medicine. Through courseware and hands-on cooking classes, medical students and physicians learn the benefits of nutrition-related lifestyle changes and how to guide their patients towards healthier choices”.

There are now over 50 medical schools that have implemented the Tulane Culinary Medicine Program into their medical school curriculum. The University of South Carolina School of Medicine (both the Charleston and Greenville
campuses) has implemented this culinary medicine program. Summer 2018 was the first semester for the University of South Carolina School of Medicine Greenville (USCSOMG) to implement this culinary medicine curriculum. This summer pilot course consisted of five medical students from the USCSOMG Lifestyle Medicine distinction track. During the summer pilot course, all materials used (recipes, lectures, videos, etc.) came from the GCCM Health Meets Food curriculum. The ten modules of the pilot study course were held in the culinary labs and classrooms at the Culinary Institute of the Carolinas at Greenville Technical College.

**Plant-Based Diet & The Mediterranean Diet**

Plant-based diets are receiving much recognition, and evidence is showing that plant rich diets are optimal for human health. Due to these findings, many of the culinary nutrition and culinary medicine programs are promoting plant-based diets to clinicians and patients. One definition states “a healthy, plant-based diet aims to maximize consumption of nutrient-dense plant foods while minimizing processed foods, oils, and animal foods (including dairy products and eggs). It encourages lots of vegetables (cooked or raw), fruits, beans, peas, lentils, soybeans, seeds, and nuts (in smaller amounts) and is generally low fat”.

“Research shows that plant-based diets are cost-effective, low-risk interventions that may lower body mass index, blood pressure, HbA1c, and cholesterol levels. They also may reduce the number of medications needed to treat chronic diseases and lower ischemic heart disease mortality rates.”
Physicians should consider recommending a plant-based diet to all their patients, especially those with high blood pressure, diabetes, cardiovascular disease, or obesity”.\textsuperscript{18}

The Academy of Nutrition and Dietetics released a position paper in 2016 stating the benefits of plant-based diets, specifically vegetarian diets. This position paper states the benefits of a plant-based diet in relation to “ischemic heart disease, type 2 diabetes, hypertension, certain types of cancer, and obesity. Low intake of saturated fat and high intakes of vegetables, fruits, whole grains, legumes, soy products, nuts and seeds (all rich in fiber and phytochemicals) are characteristics of vegetarian and vegan diets that produce lower total and low-density lipoprotein cholesterol levels and better serum glucose control. These factors contribute to reduction of chronic disease”.\textsuperscript{19}

The Mediterranean diet is a plant-based diet seen in many research studies looking at diet sustainability in relation to overall health and lifestyle behaviors. “The Mediterranean diet is known to be one of the healthiest dietary patterns… [this diet] is a plant-based pattern, where vegetables, fruits, cereals (preferably as whole grain), legumes, and nuts should be consumed in high amount and frequency. The Mediterranean dietary pattern (MDP) also includes moderate consumption of fish and shellfish, white meat, eggs, and dairy products… consumption of red meat, processed meats, and foods rich in sugars and in fats should be small in both quantity and frequency. The principal source of dietary lipids of the MDP is olive oil and an adequate daily intake of water
should be guaranteed, as well as moderate consumption of wine is recommended”. In addition to foods consumed, the Mediterranean diet also includes “cultural and lifestyle elements such as conviviality, culinary activities, physical activity, and adequate rest”. “High consumption of dietary fiber, low glycemic index and glycemic load, anti-inflammatory effects, and antioxidant compounds, may act together to produce favorable effect on health status. The Mediterranean diet is associated with a lower incidence of mortality for all-causes, and is also related to lower incidence of cardiovascular disease, type 2 diabetes, certain types of cancer, and neurodegenerative diseases”.

**Cooking With A Chef Survey**

The Cooking with a Chef (CWC) survey is used to evaluate the impact of culinary nutrition and culinary medicine programs. The CWC survey contains one index, six scales, and one knowledge test to evaluate the psychosocial measures of cooking attitudes, self-efficacy, and knowledge. The index, scales, and test of the CWC survey include availability and accessibility of fruits and vegetables (AAFV), cooking attitudes (CA), cooking behaviors (CB), self-efficacy produce consumption (SEPC), cooking self-efficacy (SEC), self-efficacy for using basic
cooking techniques (SECT), self-efficacy for fruits, vegetables, and seasonings (SEFVS), and knowledge of cooking terms and techniques (Score).22,23

“The AAFV scale consist of 8 questions and is a modified version of the AAFC inaccessibility index used in the Dave study”.22 This index is used to assess the consumption of fruits, vegetables, and juice by measuring the availability of these items in the home. The AAFV section gives participants the option to simply answer “yes” or “no”.22

The CA section focuses on measuring how participants feel about cooking. “The CA was measured with 4 items derived from the Food Preparation Attitude section of the What’s Cooking survey and the Body and Soul Peer Counselor’s Handbook”.22 Answer options for the CA section include: strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

The CB section focuses on the usual cooking behaviors of the participants. This section measures areas such as cooking with basic ingredients, using basic cooking techniques, and knife skills. “The CB was measured with 3 items from the Food and Cooking Skills Questionnaire with ordered responses: not at all, 1 to 2 times a month, once a week, several times a week, and about every day”.22

The SEPC uses 3 items to measure the self-efficacy of participants for cooking fruits, green vegetables, and root vegetables.22,23 This section also measures participants’ level of confidence related to eating fruits and vegetables in certain situations as well as their ability to meet the daily recommendation for
fruit and vegetable consumption. For this section of the CWC survey, participants are asked to “indicate the extent of self-efficacy regarding their confidence level in performing the activity using a 5-point Likert scale from 1 (not at all confident) to 5 (extremely confident)”.

The SEC section measures confidence in culinary skills and food preparation techniques. This section is assessed by a scale comprising of a list of 9 cooking techniques modified from the Meal Ideas survey. In this section, participant confidence is measured with a 5-point Likert scale ranging from 1 (not at all confident) to 5 (extremely confident) in the SEC section.

The SEFV section was originally measured by 4 items identified in the evaluation tool for the CookWell culinary nutrition education program. At this point, the SEFV section allows participants to “indicate their level of confidence in cooking certain foods using a 5-point Likert-type scale ranging from 1 (not at all confident) to 5 (extremely confident)”. Additional changes to the SEFV section include modifications to the vegetable examples used as well as the addition of five questions relating to adding flavor without using salt.

The Food Preparation What’s Cooking survey was used as a model for the Score section of the CWC survey. For formatting and context purposes, the Food Preparation What’s Cooking survey items were edited. “Eight questions were identified from Byrd-Bredbenner’s 46-item instrument for use in the present knowledge evaluation because of relevance to specific terms and techniques...”
covered during CWC program sessions”. All of this research took place to validate the CWC survey and ensure this survey is reliable.

**The Health Belief Model**

The Health Belief Model (HBM) is a conceptual framework that has been used in health behavior and health education research since the 1950s. The HBM is commonly used “to explain change of health-related behaviors and as a guiding framework for interventions”. The primary “constructs of the HBM include perceived susceptibility, perceived severity, perceived benefits and barriers to engaging in a behavior, cues to action, and self-efficacy”. The HBM explains that people are most likely to personally adopt health behaviors if they believe the following:

1. They are susceptible to a condition (at risk for disease).
2. The condition could have potentially serious consequences.
3. A course of action (behavior) available to them could be of benefit in reducing either their susceptibility to or the severity of the condition.
4. There are benefits to taking action.
5. Their perceived barriers (or costs) are outweighed by the benefits and are not strong enough to prevent action.

The intuitive aspects of the HBM have led to its popular use in community-based settings, often times used for interventions in underserved groups with lower. Though this is not the population of this culinary medicine pilot study, the participants of this pilot study course will go on to teach these culinary medicine
interventions to underserved populations in a community-based and clinical setting.

**Mixed Methods Research**

Mixed methods research has a number of similar definitions. For the purpose of this study, we define mixed methods research as:

“the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration”.

In this study, we used quantitative data to further inform qualitative data and we used qualitative data to further inform quantitative data. This mixed methods research approach allows inference of further findings than using qualitative and quantitative data independently.

**Formative Evaluation**

Formative evaluation is often used in the beginning stages of a program to assess the program’s overall validity, constructs, and impact. For the purpose of this study, the following definition is used for formative evaluation:

Formative evaluation is “the evaluation of assessment-based evidence for the purposes of providing feedback to and informing teachers, students, and educational stakeholders about the teaching and learning process”.
The overarching goal of this study is to determine the effectiveness of the culinary medicine pilot study course in relation to student knowledge, attitudes, skills, behaviors, cooking confidence and self-efficacy pertaining to culinary medicine. The primary aim of this project is to assess the culinary medicine knowledge, attitudes, skills, behaviors, cooking confidence and self-efficacy of the five medical students participating in this culinary medicine pilot course. The secondary aim is to assess each module of this culinary medicine pilot course by observing student engagement and overall efficiency and effectiveness of the course. The tertiary aim is to evaluate student feedback and satisfaction of the culinary medicine pilot course.

In order to achieve these goals, formative evaluation processes have been used to assess the progress of this pilot study course. Surveys, questionnaires, observations, and focus groups have been used throughout this study to effectively collect data for the formative evaluation of this course.
REFERENCES


41. The Goldring Center for Culinary Medicine. GCCM first and second year medical student curriculum. Tulane University School of Medicine. Published 2016.
42. The Goldring Center for Culinary Medicine. Introduction to culinary nutrition, Mediterranean diet. Tulane University School of Medicine. Published 2015.

43. The Goldring Center for Culinary Medicine. GCCM overview. Tulane University School of Medicine.


CHAPTER TWO
MATERIALS AND METHODS

Mixed Methods Research

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In this study, quantitative data is used to further inform qualitative data and qualitative data is used to further inform quantitative data. This mixed methods research approach allows inference of further findings than using qualitative and quantitative data independently.²,³

Formative Evaluation

Formative evaluation is often used in the beginning stages of a program to assess the program’s overall validity, constructs, and impact.⁵,⁶,⁷ For the purpose of this study, the following definition is used for formative evaluation:

Formative evaluation is “the evaluation of assessment-based evidence for the purposes of providing feedback to and informing teachers, students, and educational stakeholders about the teaching and learning process”.⁷
The overarching goal of this study is to determine the effectiveness of the culinary medicine pilot study course in relation to student knowledge, attitudes, skills, behaviors, cooking confidence and self-efficacy pertaining to culinary medicine. The primary aim of this project is to assess the culinary medicine knowledge, attitudes, skills, behaviors, cooking confidence and self-efficacy of the five medical students participating in this culinary medicine pilot course. The secondary aim is to assess each module of this culinary medicine pilot course by observing student engagement and overall efficiency and effectiveness of the course. The tertiary aim is to evaluate student feedback and satisfaction of the culinary medicine pilot course.

In order to achieve these goals, formative evaluation processes have been used to assess the progress of this pilot study course. Surveys, questionnaires, observations, and an exit focus group have been used throughout this study to effectively collect data for the formative evaluation of this course.

**Summer Pilot Study Description & Format**

This summer pilot study was approved by the Institutional Review Board in the Office of Research Compliance at the University of South Carolina School of Medicine Greenville (USCSOMG). All of the student participants were first year medical students at the USCSOMG. All of the student participants were also part of the USCSOMG Lifestyle Medicine Distinction Track. The USCSOMG held interviews to select which students would be eligible for this culinary medicine pilot study course. The lifestyle medicine distinction track director at the
USCSOMG attended each of the summer pilot study modules and led the lecture and nutrition portions of each module.

This summer pilot study course was held on Tuesdays and Thursdays from 9:00 AM to 1:00 PM at the Greenville Technical College (GTC) Berea Campus. The orientation class session took place on Thursday, May 31st, 2018, the first official class session was held on Tuesday, June 5th, 2018, and the last summer class session was held on Thursday, July 12th, 2018. Each class session consisted of a lecture, laboratory, nutrition, meal, and clean up section.

The Tulane University, Goldring Center for Culinary Medicine, Health Meets Food Curriculum was used for this culinary medicine course. The students were responsible for pre-class readings, videos and a quiz prior to each class session. The students were also responsible for reviewing assigned recipes prior to coming to class. Each class session began at 9:00 AM and started with the lecture portion of the course in the designated lecture room on the GTC campus. The lecture portion focused on a case study pertaining to the specific module topic that day. The students worked on the case study as a group from 9:00 AM to 9:50 AM. Students then took a 10 minute break from 9:50 AM to 10:00 AM. At 10:00 AM students moved to the kitchen for the laboratory section of the class. The chef, a GTC faculty member, led the laboratory section of each module. Each student was assigned one, two, or three recipes (depending on difficulty and time constraints) by the chef prior to coming to class. Some students were grouped in pairs of two, and other students worked individually.
These groups changed from module to module depending on the specific recipes associated with each module. The students were allotted approximately 10 minutes, from 10:00 AM to 10:10 AM, to get all of their ingredients in place before starting to cook. This is formally called “mise en place”, or to “set in place”. After getting all ingredients and cookware in order, the chef hosted a demonstration session for each module. The demonstration session lasted approximately 25 minutes from 10:10 AM to 10:35 AM. During the demonstration session, the chef quickly discussed the day’s recipes and expounded on specific cooking techniques and knife skills that pertained to the module’s recipes.

After the chef demonstration session, all of the students returned to their stations to begin working on their recipes for the day. The students were allotted approximately one hour to complete their recipes for each module, from 10:35 AM to 11:30 AM. Some days the students exceeded their time limit, but adherence to the schedule improved as the summer pilot course went on. While the students prepared their recipes a GTC lab assistant and two volunteer assistants helped the students to ensure they had all of the supplies and ingredients they needed. This greatly helped the students finish their recipes in a more timely manner and adhere to the schedule.

Once all of the recipes were complete and on the serving line, all students, instructors and lab assistants gathered around the serving line display to discuss the nutritional aspects of each dish. The nutrition discussion of each module took approximately 25 minutes. The lifestyle medicine distinction track director from
USC SOMG led this portion of each module. The director inquired about each food dish, and the student who made that particular dish would read the nutrition facts from their recipe sheet. Each student would also discuss the portion size of each dish they prepared. If the portion size or nutrient content of a particular dish stood out, they would further discuss how this might impact a patient. For example, if the portion size was large, but the calorie density was relatively low, the director and the students discussed the benefit of the patient’s satiety while lowering their caloric intake to aid with weight loss.

After the nutrition discussion was complete, all students, instructors and assistants filled a plate with food from the serving display. Everyone sat together and ate for approximately 30 minutes. During the meal portion of each module students, instructors and assistants discussed the specific recipes made, likes and dislikes of each dish, and how various recipes may pertain to patients.

Once finished eating, students and assistants began the clean-up portion of the module. The clean-up portion consisted of washing dishes, sanitizing the countertops, storing or disposing of leftover food, sweeping, mopping, and cleaning anything else in the kitchen that may have been used during the laboratory portion of the module that day. Each student and the two volunteer assistants worked as a team to clean the kitchen and ensure each module was finished in a timely manner.
Greenville Technical College Culinary Institute of the Carolinas

The Culinary Institute of the Carolinas is housed at the Greenville Technical College in Berea, South Carolina. The chef who taught the culinary portion of the culinary medicine summer pilot study course is a faculty member of Greenville Technical College (GTC), as is the GTC lab assistant who participated in the course. Another member of the GTC staff was responsible for all of the purchase orders for each module of this culinary medicine course. USCSOMG was able to use the Culinary Institute of the Carolinas’ immaculate facilities for the culinary medicine summer pilot study course. The kitchen included a work station for each medical student, industrial ovens with gas stovetops, griddles, convection ovens, refrigerators, a chill-blast freezer, an indoor grill, a composter, and many other commercial-grade appliances. There is a dish room adjacent to the kitchen with a commercial dishwasher. Having such incredible facilities greatly contributed to the overall success of this summer pilot study course.

Health Meets Food Culinary Medicine Curriculum

For this summer pilot study, the Health Meets Food Courseware was used as the educational curriculum component. The Health Meets Food curriculum was developed by the Tulane University, Goldring Center for Culinary Medicine. The Goldring team has made incredible efforts to promote this curriculum, and now over 50 U.S. medical sites have implemented this program into their medical education curriculum and residency programs.
The USCSOMG 2018 summer course consisted of ten Health Meets Food course modules. Each module is comprised of goals, medical nutrition learning objectives, culinary nutrition learning objectives, student expectations prior to class, and a 3-4 hour in class component (GCCM).\textsuperscript{16-19} Student expectations prior to class include completion of a video lecture covering the medical and culinary objectives, review of journal articles, and completion of an assessment quiz for the respective module. The in-class component of each module consists of a brief review session, an individual or group completion of a case study related to the respective module topic, recipe production in the kitchen, tasting and discussion of the recipes prepared, and kitchen cleanup (GCCM).

**Summer Pilot Study Module Topics**

Throughout the duration of this summer pilot study course, ten module topics from the Health Meets Food curriculum were completed.\textsuperscript{16} The topics covered over the course of the summer pilot study include the following:

1. Orientation, Safety and Sanitation
2. Introduction to Culinary Medicine
3. Weight Management and Portion Control
4. Fats
5. Food Allergy and Intolerance
6. Protein, Amino Acids, and Vegetarian Diets
The orientation, safety and sanitation module focused on food safety, knife safety and skills, and kitchen safety, familiarity, and terminology. The cooking component of this first module was completed by a lab assistant. The medical students chopped vegetables and practiced knife skills during the orientation module. The introduction to culinary medicine module focused on defining culinary medicine and the importance of nutrition and lifestyle behaviors in relation to medicine. During this introductory module, the medical students were responsible for preparing and cooking the assigned recipes. However, the students were provided much direction and guidance by the teaching chef and the lab assistant. The recipes created during the introductory module were quite simple and easy for the students to prepare. As the summer pilot study progressed, students were expected to become more independent in the kitchen.

The third module, weight management and portion control, focused on the importance of portion size while still meeting a reasonable level of satiety. The weight management and portion control module focused on protein and fiber rich foods in order to aid in portion control and overall satiety. The next module covered the topic of fats in the diet. The focus of this module included the importance of consuming healthy fats and the associated health benefits. Foods
such as hummus, avocado, and olive oil were used in the kitchen for this module to illustrate their flavor profiles and how filling these foods are. The fifth module, food allergy and intolerance, discussed the aspects of dietary changes that must be made when patients experience allergic reactions or intolerances to certain foods. This module focused on the importance of maintaining flavor, texture and nutrient density when substituting ingredients for allergies and intolerances. Module six covered protein, amino acids, and vegetarian diets. This module focused on the importance of consuming adequate amounts of protein when following a vegetarian diet. Foods such as beans and cheese were used in this module to increase the protein content of the foods made. Module seven, renal physiology, hypertension, sodium and potassium homeostasis, sodium reduction and flavor building, really focused on reducing sodium in the diet while maintaining overall flavor of the dishes that were prepared. A number of seasonings, spices, and oils were used in this module’s recipes in order to enhance flavor profiles while reducing the salt content dramatically, even entirely for some of the recipes.

Module eight focused on the topics of carbohydrates, fiber, diabetes, snacking and desserts. The foods prepared in this module contained complex carbohydrates rather than refined carbohydrates. For example, oatmeal, nuts, and fruits were used in place of refined flours and sugars used in traditional recipes. Again, this module emphasized the importance of maintaining flavor, texture and nutrient profiles when making such ingredient substitutions. The
pediatric diet was the topic for module nine. This module emphasized the importance of nutrient dense foods for children and how to make these foods more tasteful and fun for children to consume. Module ten, the final module of the summer pilot study, consisted of student presentations, advisor evaluations and food preparation in the kitchen. The students prepared their food items prior to presenting, then following the presentations, the students and their advisors gathered in the kitchen to eat together and discuss various aspects of the summer pilot study course.

**Assessment Tools**

*Cooking with a Chef Survey*

The Cooking with a Chef Survey is an assessment tool that has been validated through previous research studies.\(^8,11\) The Cooking with a Chef survey has been edited and updated multiple times in order to further improve its use as an assessment tool.\(^9,10\) The Cooking with a Chef survey consists of eight sections including one index, six scales, and one knowledge test. The eight sections of the Cooking with a Chef survey measure the following:

1. Availability and Accessibility of Fruits and Vegetables (AAFV)
2. Cooking Attitudes (CA)
3. Cooking Behaviors (CB)
4. Self-Efficacy of Produce Consumption (SEPC)
5. Cooking Self-Efficacy (SEC)
6. Self-Efficacy for Using Basic Cooking Techniques (SSECT)
8. Knowledge of Cooking Terms and Techniques

_Culinary Medicine Curriculum Delivery Observation Checklist_

The observation checklist was developed to measure the level of student engagement throughout each section of each module as well as measure the overall adherence to the time scheduled for each portion of each module. The observation checklist asked the following questions:

1. Are the students engaged in this module’s lecture section?
2. Are the students engaged in this module’s laboratory section?
3. Do the students seem to enjoy eating the food they cooked in lab?
4. Are the students engaged in this module’s discussion section?
5. Is there enough time allotted for this module’s kitchen preparation?
6. Is there enough time allotted for this module’s lecture section?
7. Is there enough time allotted for this module’s laboratory section?
8. Is there enough time allotted for this module’s discussion section?
9. Is there enough time allotted for this module’s clean up section?
10. Is there an excess amount of food leftover at the end of this module?

A scale ranging from one to five was used to measure the answer to each question of the observation checklist for each of the ten modules in the summer pilot study course. Notes were also taken in conjunction with the observation
checklist to further expound on time adherence and student engagement. If the schedule was not strictly adhered to, the notes explain why this deviation occurred.

_Culinary Medicine Curriculum Delivery Participant Feedback Questionnaire_

The Culinary Medicine Curriculum Delivery Participant Feedback Questionnaire was used to collect additional feedback from the participants involved in the culinary medicine summer pilot study course. Each participant completed the questionnaire within four days of the last culinary medicine module of the summer course. The participant feedback questionnaire consisted of the following ten questions:

1. There was enough time allotted to each module.
2. The sequence of module presentation was organized and clearly explained.
3. The course location was convenient in relation to your commute.
4. All members of this course worked well together.
5. The time put into this course was beneficial to my career.
6. I would recommend this course to a fellow peer.
7. This course provided a greater understanding of culinary medicine.
8. This course positively influenced my personal dietary habits.
9. I am pleased with the overall quality of this course.
10. I am pleased with the overall content of this course.
Culinary Medicine Curriculum Focus Group to Follow Feedback Questionnaire

The culinary medicine curriculum exit focus group consisted of eight questions. This focus group was administered in order to gain more feedback from the five medical students whom participated in this summer pilot study course. The exit focus group took place at the University of South Carolina School of Medicine Greenville campus. All five medical students were present for the focus group. One student left the room 5-10 minutes prior to the closing of the focus group. The exit focus group consisted of the following questions:

1. Have you recreated any of the Culinary Medicine Curriculum recipes at home? What recipes have you recreated? Tell about the re-creating process.

2. Share a recipe from the Culinary Medicine course you would want to recommend to others pursuing a Mediterranean diet. What is it about the recipe you want to share?

3. After this summer’s Culinary Medicine course, how would you reduce the amount of salt listed in a recipe and maintain adequate flavor?

4. From this summer’s Culinary Medicine course, were there any recipes you did not like? If so, please name one. What did you not like about it?

5. Do you have suggestions for the time allotted to each section of the modules? What suggestions do you have?

6. Do you have suggestions for the improvement of the case exercise (lecture) section of the course?

7. Do you have any suggestions for the improvement of the cooking (laboratory) section of the course?

8. Do you have any suggestions for the improvement of the nutrition review and meal section of the course?
The focus group was administered by a student researcher and a Clemson University faculty member and research advisor took notes throughout the duration of the focus group. The focus group was audio recorded to aid in the transcription and evaluation of the questions asked and the students’ responses. The exit focus group was 45 minutes long from start to finish. The students were very engaged and gave informative explanations to each question asked during the exit focus group.

Data Collection

All data from the cooking with a chef survey and participant feedback questionnaire was collected by the USC School of Medicine Greenville via REDCap software. Each student participant was assigned an ID number within the REDCap system in order to keep all data anonymous. The student researcher of this project was given access to create a personal REDCap account to access the data from the CWC survey responses and the participant feedback questionnaire responses. As for the observation checklist, the student researcher collected all data for each module and inputted the data into an excel spreadsheet. Data from the exit focus group was collected by the student researcher and research advisor. The exit focus group was audio recorded to allow for reference back to the student responses for further qualitative description. This study was approved by the Institutional Review Board in the Office of Research Compliance at the University of South Carolina School of
Medicine Greenville (USCSOMG), and all aspects of this study submitted to the USCSOMG IRB were strictly adhered to. Furthermore, the Clemson University Office of Research Compliance accepted the USC exempt determination. The Clemson University IRB number for this study is IRB2019-048.

Data Analysis

To determine if CWC survey questions changed from the pre survey to the post survey, a series of graphs and t-tests were performed. Data were manipulated and captured using REDCap and Microsoft Excel Software systems.\textsuperscript{21-23} Statistical calculations, graphs and t-tests were performed with JMP Pro 13 software.\textsuperscript{24} P-values less than or equal to 0.05 were considered evidence of statistical significance. P-values greater than 0.05 and less than 0.1 were considered evidence of weakly significant statistical shifts.
REFERENCES


19. The Goldring Center for Culinary Medicine. GCCM overview. Tulane University School of Medicine.


CHAPTER THREE
DATA ANALYSIS AND RESULTS

Pilot Study Participants

All of the participants (n=5) for this culinary medicine pilot study course were first year medical students at the University of South Carolina School of Medicine Greenville (USCSOMG).¹ These students were also part of the lifestyle medicine distinction track offered through the USCSOMG.² Each student applied for this culinary medicine course and went through an interview process before being accepted into the pilot study. The USCSOMG conducted all of the application and interview processes.

Data Collection

All data from the cooking with a chef survey and participant feedback questionnaire was collected by the USC School of Medicine Greenville via REDCap.³⁴ Each student participant was assigned an ID number within the REDCap system in order to keep all data anonymous. The student researcher of this project was given access to create a personal REDCap account to access the data from the CWC surveys and the participant feedback questionnaires. As for the observation checklist, all data for each module was collected and inputted into an excel spreadsheet. Data from the exit focus group was collected in a conference room at the USCSOMG campus. The exit focus group was audio recorded to allow reference to the student responses for further qualitative
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**Statistical Analysis of the Cooking With A Chef Survey**

The cooking with a chef survey (CWC survey) was administered to the medical students prior to the start of the culinary medicine summer pilot study course and again after the summer pilot study was completed. The pre and post surveys were delivered to the students digitally via REDCap software. Each student completed the pre and post CWC survey independently.
JMP Pro 13 software was used to analyze the pre and post CWC survey responses. T-tests were performed on each of the CWC survey questions. Those with p-values less than or equal to 0.05 were considered significant changes from the pre survey to the post survey. Those with p-values greater than 0.05 and less than 0.1 were considered weakly significant shifts from the pre survey to the post survey. Due to the small sample size of this pilot study, these weakly significant shifts are considered to be statistically relevant for the sake of this research.

**Cooking With A Chef Survey Pre & Post Results**

The Cooking with a Chef Survey (CWC) is divided into eight sections used to evaluate the psychological measures of cooking attitudes, self-efficacy, and knowledge.\(^7\)\(^-\)\(^10\) The eight sections of the CWC survey include one index, six scales, and one knowledge test. The index measures availability and accessibility of fruits and vegetables (AAFV). The six scales include the following sections: cooking attitudes (CA), cooking behaviors (CB), self-efficacy of produce consumption (SEPC), cooking self-efficacy (SEC), self-efficacy for using basic cooking techniques (SECT), and self-efficacy for fruits, vegetables, and seasonings (SEFVS). The knowledge test measures participant knowledge of cooking terms and techniques.\(^7\)\(^-\)\(^10\)

Statistical analysis of the CWC surveys taken pre and post culinary medicine course found the following CWC survey items shifted significantly from pre survey to post survey. The following CWC survey questions significantly
shifted from the pre survey to the post survey: Question 14, 22, 26, 28, 35, 36, 37, 39, 40, 41, 43, 46, 48, 50, 51, 54, & 55.

<table>
<thead>
<tr>
<th>Cooking Attitude Section</th>
<th>For each item below, indicate the extent to which you agree or disagree with the statement about cooking (measured “strongly disagree” to “strongly agree”).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 14</td>
<td>Cooking is fun.</td>
</tr>
<tr>
<td>Question 22</td>
<td>Cooking is frustrating.</td>
</tr>
<tr>
<td>Question 26</td>
<td>I find cooking tiring.</td>
</tr>
</tbody>
</table>

**Figure 2** Significant shifts in the cooking attitude section of the CWC survey

<table>
<thead>
<tr>
<th>Cooking Behaviors Section</th>
<th>During the past month how often did you do the following (measured “not at all” to “about everyday”)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 28</td>
<td>Prepare meals using convenience items (such as bagged salad, prepared mashed potatoes, pre-shredded carrots, deli rotisserie chicken).</td>
</tr>
</tbody>
</table>

**Figure 3** Significant shifts in the cooking behaviors section of the CWC survey

<table>
<thead>
<tr>
<th>Cooking Self-efficacy Section</th>
<th>Indicate the extent to which you feel confident about performing the particular activity (measured from “NOT at all confident” to “extremely confident”).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 35</td>
<td>Prepare dinner from items you currently have in your pantry and refrigerator.</td>
</tr>
<tr>
<td>Question 36</td>
<td>Use knife skills in the kitchen.</td>
</tr>
<tr>
<td>Question 37</td>
<td>Plan nutritious meals.</td>
</tr>
</tbody>
</table>

**Figure 4** Significant shifts in the cooking self-efficacy section of the CWC survey
<table>
<thead>
<tr>
<th><strong>Self-efficacy for Using Basic Cooking Techniques Section</strong></th>
<th>Indicate the extent to which you feel confident about performing the particular activity (measured from “NOT at all confident” to “extremely confident”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 39</td>
<td>Boiling</td>
</tr>
<tr>
<td>Question 40</td>
<td>Simmering</td>
</tr>
<tr>
<td>Question 41</td>
<td>Steaming</td>
</tr>
<tr>
<td>Question 43</td>
<td>Sautéing</td>
</tr>
<tr>
<td>Question 46</td>
<td>Poaching</td>
</tr>
<tr>
<td>Questions 48</td>
<td>Roasting</td>
</tr>
<tr>
<td>Question 50</td>
<td>Microwaving</td>
</tr>
<tr>
<td>Question 51</td>
<td>Reusing leftovers for another meal</td>
</tr>
</tbody>
</table>

**Figure 5** Significant shifts in the self-efficacy for using basic cooking techniques section of the CWC survey

<table>
<thead>
<tr>
<th><strong>Self-efficacy for Fruits, Vegetables, and Seasonings Section</strong></th>
<th>Indicate the extent to which you currently feel confident about preparing the following foods (measured “NOT at all confident” to “extremely confident”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 54</td>
<td>Fruit (ex: peaches, watermelon)</td>
</tr>
<tr>
<td>Question 55</td>
<td>Herbs and spices (ex: basil, thyme, cayenne pepper)</td>
</tr>
</tbody>
</table>

**Figure 6** Significant shifts in the self-efficacy for fruits, vegetables, and seasonings section of the CWC survey

Statistical analysis of the CWC surveys taken pre and post culinary medicine course found the following CWC survey items shifted in a weakly significantly manner from pre survey to post survey: Questions 1, 2, 10, 11, 12,
13, 15, 16, 19, 33, 34, 38, 42, 45, 47, 52, 53, & 57. Weakly significant shifts were recognized for the sake of this study due to the small number of participants (n=5).

<table>
<thead>
<tr>
<th>Accessibility of Fruits and Vegetables Section</th>
<th>This section is about the presence of fruits and vegetables in your house during the past week. Please circle YES or NO for EACH question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>Did you have pure (100%) fruit juice in your home last week?</td>
</tr>
<tr>
<td>Question 2</td>
<td>Did you have fresh fruit in your home last week?</td>
</tr>
</tbody>
</table>

**Figure 7** Weakly significant shifts in the accessibility of fruits and vegetables section of the CWC survey

<table>
<thead>
<tr>
<th>Cooking Attitude Section</th>
<th>For each item below, indicate the extent to which you agree or disagree with the statement about cooking (measured “strongly disagree” to “strongly agree”).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 10</td>
<td>Preparing meals at home would NOT improve the health of my diet.</td>
</tr>
<tr>
<td>Question 11</td>
<td>Cooking meals is a good use of my time.</td>
</tr>
<tr>
<td>Question 12</td>
<td>I enjoy cooking.</td>
</tr>
<tr>
<td>Question 13</td>
<td>It is important to know how to prepare food.</td>
</tr>
<tr>
<td>Question 15</td>
<td>I do NOT like to prepare meals at home because it costs too much money.</td>
</tr>
<tr>
<td>Question 16</td>
<td>It is NOT important that I know how to cook.</td>
</tr>
<tr>
<td>Question 19</td>
<td>It is important to eat the recommended 2 cups of fruit each day.</td>
</tr>
</tbody>
</table>

**Figure 8** Weakly significant shifts in the cooking attitude section of the CWC survey
<table>
<thead>
<tr>
<th>Cooking Self-efficacy Section</th>
<th>Indicate the extent to which you feel confident about performing the particular activity (measured from “NOT at all confident” to “extremely confident”).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 33</td>
<td>Cooking from basic ingredients (ex: whole lettuce heads, fresh tomatoes, raw chicken)</td>
</tr>
<tr>
<td>Question 34</td>
<td>Follow a written recipe (ex: preparing fresh salsa from tomatoes, onion, garlic, jalapeno peppers)</td>
</tr>
<tr>
<td>Question 38</td>
<td>Use basic cooking techniques.</td>
</tr>
</tbody>
</table>

**Figure 9** Weakly significant shifts in the cooking self-efficacy section of the CWC survey

<table>
<thead>
<tr>
<th>Self-efficacy for Using Basic Cooking Techniques Section</th>
<th>Indicate the extent to which you feel confident about performing the particular activity (measured from “NOT at all confident” to “extremely confident”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 42</td>
<td>Deep frying</td>
</tr>
<tr>
<td>Question 45</td>
<td>Grilling</td>
</tr>
<tr>
<td>Question 47</td>
<td>Baking</td>
</tr>
</tbody>
</table>

**Figure 10** Weakly significant shifts in the self-efficacy for using basic cooking techniques section of the CWC survey

<table>
<thead>
<tr>
<th>Self-efficacy for Fruits, Vegetables, and Seasonings Section</th>
<th>Indicate the extent to which you currently feel confident about preparing the following foods (measured “NOT at all confident” to “extremely confident”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 52</td>
<td>Fresh or frozen green vegetables (ex: broccoli, spinach)</td>
</tr>
<tr>
<td>Question 53</td>
<td>Root vegetables (ex: potatoes, beets, sweet potatoes)</td>
</tr>
</tbody>
</table>

**Figure 11** Weakly significant shifts in the self-efficacy for fruits, vegetables and seasonings section of the CWC survey
### Knowledge of Cooking Terms and Techniques

Indicate what you believe is the best answer by checking the box next to your response (measured via four multiple choice options).

<table>
<thead>
<tr>
<th>Question 57</th>
<th>If a recipe tells you to sauté an onion, you should cook it:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>In a basket set above boiling water.</td>
</tr>
<tr>
<td>b.</td>
<td>In a pan with a small amount of hot oil.</td>
</tr>
<tr>
<td>c.</td>
<td>In a pan with a small amount of water.</td>
</tr>
<tr>
<td>d.</td>
<td>Don't know.</td>
</tr>
</tbody>
</table>

#### Figure 12
Weakly significant shifts in the knowledge of cooking terms and techniques section of the CWC survey

**Review of Observation Checklist, Focus Group & Participant Feedback Questionnaire**

In order to discuss the associations between the quantitative data from the cooking with a chef survey and the qualitative data from the observation checklist, focus group and feedback questionnaire, extensive review took place. Expert review of the observation checklist, focus group and participant feedback questionnaire allowed experienced reviewers to look through the results of the observation checklist, focus group and the participant feedback questionnaire and provide extraordinarily beneficial input related to both the quantitative and qualitative data.

Review of the qualitative results involved critical evaluation of the observations listed for each module within the observation checklist, the responses to each question of the exit focus group, and the responses to each question of the participant feedback questionnaire. While evaluating these results, reviewers focused on common recurring themes and patterns throughout
the observation checklist, exit focus group, participant feedback questionnaire, as well as the results of the pre and post CWC surveys. Coding, clustering and grouping techniques were then used to organized these patterns and themes into categories and subcategories.

**Descriptive Analysis of the Exit Focus Group**

The exit focus group was held at the University of South Carolina School of Medicine Greenville Campus. All students attended the focus group. Students were asked a series of eight questions. Handwritten notes were taken throughout the duration of the focus group. The focus group was audio recorded for the purpose of focus group transcription and data analytics. The following findings are based on expert review and interpretation of the exit focus group results.

Expert review of the focus group included the involvement of two research committee members as well as input from the student researcher who conducted the focus group. One committee member is a registered dietitian experienced in focus group review and coding. The other committee member is a culinary nutritionist with extensive experience in field research. This meeting took place on the Clemson University campus in a conference room in the Poole Agricultural Center. This review process involved detailed analysis of the focus group transcription. Prior to the review meeting, each reviewer thoroughly read through the focus group transcription a minimum of three times to assess common, recurring themes throughout the entirety of the focus group. Upon arrival to the review meeting, each reviewer discussed their findings. All findings were written
on a whiteboard to compare each reviewers' notes. If two or more reviewers found the same common, recurring themes, then this theme was included in the project data. If less than two reviewers made note of a theme, this theme was excluded from the project data. All common, recurring themes were listed on the whiteboard. A specific color (blue, yellow, green, etc.) was selected for each theme, and each reviewer went through a separate paper copy of the focus group transcription and highlighted each part of all common, recurring themes in their respective selected color. These three paper copies with highlights were then used to write-up the following findings of the focus group results.

The common, recurring themes and topics throughout the focus group include recipe sharing, cooking technique, the nutrition section of the curriculum, enjoyment of working together, encouraging patients to eat healthier, student dietary changes during the summer pilot study, science basis in relation to curriculum case studies, food ingredients, timing and organization of the overall pilot study course, and recipe preferences. In order to fully understand these recurring themes and topics in relation to the additional data collected, further discussion of the focus group follows.

Throughout the focus group, the majority of students mentioned sharing various recipes from the culinary medicine course with friends, family and fellow peers. Often times students would prepare a recipe in class, and they enjoyed the recipe so much they went home to roommates, spouses or parents and verbally shared the recipe or even went to the extent of making recipes for their
friends and family to try. In conjunction with recipe sharing, the students also mentioned recreating their own versions of recipes made in class. For example, one student mentioned making the tofu scramble from class, but they used different vegetables at home based on the vegetable ingredients they had in their pantry and refrigerator. Another student had recreated the eggplant ratatouille, mango salsa, fish tacos and Thai peanut sauce at home. This student said they recreated these recipes very similar to how they were made in class, but did not go out of their way to purchase ingredients that did not seem to matter, for example, cilantro, spices, and seasonings. A third student mentioned recreating the cauliflower mac and cheese, but said they did use more cheese when recreating the recipe at home.

Cooking technique is another very popular topic throughout the focus group. Each student voiced their interest in learning more about specific cooking techniques rather than basic cooking skills. For example, the students mentioned the cooking topics that were covered in the cooking demonstrations at the beginning of each culinary medicine module. The chef typically discussed each of the day’s recipes briefly, mentioned knife skills for the day, and chose one or two foods to demonstrate chopping methods or a particular cooking technique (i.e. how to cut a mango or how to peel and chop an onion). Though the students were interested in these techniques, they felt as if these skills were more elementary and were more interested in learning how to cut the bloodline out of a fish or how to remove the silverskin from a pork tenderloin. The chef would
typically teach the students how to perform these more complex techniques on an individual basis. For example, if one student had the fish taco recipe for that day, the chef went to that particular student’s station to teach them how to cut out the bloodline of the fish. Throughout the focus group, the students suggested these more complex techniques be used for the chef demos for all of the students to learn as a group.

The nutrition section of the culinary medicine course modules was another recurring topic. All of the students agreed that this portion of the modules could be greatly improved. Students stated that they felt like they simply read the nutrition facts off of their recipe sheets during the nutrition review portion of each module. All of the students agreed that it seemed like this portion of each module was monotonous and took too long. One student stated “I didn’t always comprehend it. I wasn’t listening as well as I should have.” Other students responded and agreed. Another student brought up an instance when someone jokingly mentioned that a cup of spinach contained 400 calories during the nutrition review section, but no one caught the joke because everyone was passively listening to the presentation of nutrition facts.

One student suggested relating the nutrition facts to the case study in order to help with overall engagement and information retention. This student explained that relating the nutrition facts to the case study patient and discussing why a particular food or dish would be beneficial to that particular patient could be helpful in the improvement of the nutrition review section. Another student
mentioned it could also be helpful to discuss the basic skills and techniques used during the production of each recipe. This student mentioned that production of these recipes did not become easy for them until they knew basic knife skills. It was then brought up that it could be beneficial to briefly discuss knife skills and basic cooking techniques when engaging with patients, particularly tying this back to the case study patient for the sake of the culinary medicine course modules.

Another student mentioned the aspect of being a visual learner and how this pertained to the nutrition review section of the course. This student stated that they would often lean over to view the recipe sheet the presenter was reading from because actually seeing the nutrition facts helped this student retain the information. This led to the idea that it may be helpful to write the nutrition facts on the whiteboard each day. In response to the visual component, another student stated it would be helpful if some form of application occurred while the nutrition facts were being presented. As an example, it was mentioned that for a hypertensive patient, sodium and saturated fat are of utmost importance to be removed from the diet. However, it would be highly beneficial to learn more about the importance of fiber or specific vitamins in this hypertensive patient’s diet. All of the students agreed that incorporating more biochemistry and physiology in relation to the nutrition component of the course would greatly help them retain the nutrition information from the nutrition review section of each course module.
In relation to where the discussion of the nutrition review section led, the theme of a scientific basis in relation to the culinary medicine curriculum came up frequently throughout the focus group. All of the students were appreciative of the fact that the curriculum case studies served as a biochemistry and physiology refresher. One student mentioned they had planned to review various topics covered during their first year of medical school, and they said the culinary medicine course actually covered these topics in place of extracurricular review. That being said, this student was very glad they had been able to review past information while learning this new information pertaining to culinary medicine simultaneously.

Recipe preferences along with specific food ingredients were also recurring themes discussed throughout the focus group. When asked to “share a recipe from the culinary medicine course you would want to recommend to others pursuing a Mediterranean diet” and “what is it about the recipe you want to share”, students tended to mention recipes they personally liked. One student stated they would share the mango salsa recipe because the recipe incorporated multiple servings of fruit. This student said in comparison to fruit, “vegetables are easier to incorporate into the diet.” Another student mentioned sharing the spaghetti and lentils recipe due to the high fiber and vegetable content and low saturated fat content in comparison to traditional spaghetti with meat sauce. Shrimp and quinoa was another recipe one student said they would share because this recipe “felt fancy”. This student said it was even fancy enough for a
holiday, but it was not difficult to prepare. Other recipes that were mentioned included the Portobello mushroom burger, black bean burger, eggplant ratatouille, and tofu scramble. Smoothies made in the culinary medicine course were also mentioned as suitable recipes to share. However, one student did bring up the fact that one of the smoothie recipes did contain coconut milk and stated this may not be an ingredient patients are used to purchasing or consuming. Coconut pecan date balls were also brought up as a recipe to share, but it was also mentioned that this was likely the most expensive recipe made throughout the culinary medicine course. One student mentioned, dates are the most expensive dried fruit and pecans are one of the most expensive nuts to purchase.

Students also mentioned recipes they did not particularly care for, and most of the dislikes were related to food texture and flavor profile. For example, one student mentioned they did not like the yogurt parfait because it was made with non-fat plain yogurt. They said the sourness of the plain yogurt was not appealing. Another student mentioned a yogurt ranch dressing made in class. They said the yogurt ranch dressing did not taste bad, but they did not like thinking about it as a ranch dressing substitute. This student said if they think about it as a yogurt dressing, then it tastes good, but if they think about it as a ranch dressing substitute, then they do not like the way it tastes. Another student agreed and said, “it did not taste at all like ranch”, and they felt like this happened with several recipes throughout the course. For example, the cauliflower mac and
cheese, this student said they liked the cauliflower mac and cheese, but it did not serve as a macaroni and cheese substitute in their opinion.

In conjunction with the theme of favorite recipes and specific food ingredients, the students also mentioned the importance of the patients’ diet frequently throughout the focus group. The students were interested in encouraging patients to eat healthier by finding creative ways to interest the patients in a particular food item or recipe, keeping preparation of recipes simple and concise, as well as remaining cognizant of the patient’s economic resources and time availability.

Timing and organization of the overall culinary medicine pilot study course was a major theme throughout the duration of the focus group. Students acknowledged the changes that were made to the schedule during the course, and all of the students appreciated these changes. Several of the students brought up the timing of the chef demonstrations, and students were in agreement that many of the demonstrations took too long and this encroached on the students’ cooking time in the kitchen. The students agreed that “streamlining” the chef demonstrations would lead to overall improvement and efficiency for the course. As mentioned earlier, the students did go on to say they would prefer to focus on cooking techniques and knife skills during the chef demos rather than specific recipe details. Students also agreed that it would be helpful to have more of a structured plan allotted to the first few minutes in the kitchen. This was referred to as “mise en place”, french for “everything in its
place”, and the students felt as if they could have used more guidance during these first few minutes in the kitchen.

When asked if they had any “suggestions for the improvement of the case exercise (lecture) portion of the course”, all of the students stated they were very pleased with the structure of this section of each module. The students really appreciated the biochemistry that was incorporated into the case studies, and they all enjoyed working together on these exercises rather than completing them individually. One student stated they appreciated that the case exercises frequently prompted them to calculate specific protein or calorie needs for the case patient; even though these calculations are “annoying”, this student did admit these calculations are necessary for them to learn. Another student stated they felt as if these case exercises were preparing them for residency and even rotations as they discussed patient cases, pathology, and patient diagnoses amongst themselves as a group rather than working individually.

As for the cooking (laboratory) section of the course, the students had a few suggestions during the focus group. They reiterated their suggestions for the chef demos, as mentioned previously. The students also mentioned the involvement of the Greenville Technical College (GTC) lab assistant as well as two additional volunteer assistants. The students agreed, that the GTC lab assistant was extremely helpful and vital to their success in the kitchen. They also discussed the involvement of the two volunteer assistants (one from USCSOMG and one from Clemson University), stating that help from them in the
kitchen was very useful and played a huge role in meeting their cooking time constraints. One student mentioned having two volunteer assistants and a GTC lab assistant would be necessary for the success of future culinary medicine courses.

Only having one focus group for this culinary medicine course could be a limitation for this study. In order to reduce the limitations of this single focus group, culinary medicine course educators and coordinators where asked to not be a part of the focus group in order to reduce the potential of bias in the students’ responses to the focus group questions.

**Descriptive Analysis of the Observation Checklist**

The observation checklist was primarily used to measure student engagement and adherence to the schedule during each module of the culinary medicine course. The following ten questions were measured for each culinary medicine course module:

1. Are the students engaged in this module’s lecture section?
2. Are the students engaged in this module’s laboratory section?
3. Do the students seem to enjoy eating the food they cooked in lab?
4. Are the students engaged in this module’s discussion section?
5. Is there enough time allotted for this module’s kitchen preparation?
6. Is there enough time allotted for this module’s lecture section?
7. Is there enough time allotted for this module’s laboratory section?
8. Is there enough time allotted for this module’s discussion section?
9. Is there enough time allotted for this module’s clean up section?
10. Is there an excess amount of food leftover at the end of this module?

All of the questions were scored via a Likert-type scale ranging from 1 to 5. A score of 1 indicates “not at all” and a score of 5 indicates “extremely”. The majority of the modules were consistent regarding student engagement. As for student engagement in each section of each module, scores of 4 or 5 were consistently given. This indicates all of the students were very engaged or extremely engaged in each section of each module throughout the duration of the culinary medicine course.

The questions regarding time adherence to the allotted schedule did vary from module to module throughout the duration of the culinary medicine course. Initially, the schedule was not adhered to. However, as the course continued, adherence to the schedule did greatly improve. It is also important to note, the schedule was changed for the 5th module and throughout the duration of the culinary medicine course. Below is the initial course schedule for modules 1 through 4 as well as the altered schedule for modules 5 through 9.

Schedule for Modules 1 through 4

9:00 - 9:10 AM - Review Quiz
9:10 - 9:40 AM - Case Study Exercise & Recipe Review
9:40 - 9:50 AM - Break & Change into Uniforms
9:50 - 11:30 AM - Cooking in the Kitchen
11:30 - 12:00 PM - Nutrition Facts & Meal
12:00 - 12:30 PM - Clean Kitchen
12:30 - 1:00 PM - Case Study Discuss
Schedule for Modules 5 through 9

9:00 - 9:10 AM - Review Quiz
9:10 - 9:50 AM - Case Study Exercise & Discussion
9:50 - 9:55 AM - Break
9:55 - 10:15 AM - Chef Demo in Kitchen
10:15 - 11:45 AM - Cooking in the Kitchen
11:45 - 12:30 PM - Nutrition Facts & Meal
12:30 - 1:00 PM - Clean Kitchen

The last module of the summer culinary medicine course, module 10, was a student project module. Each student was responsible for developing and presenting their own case study, finding or creating a recipe relevant to their case study patient, and producing this recipe in the kitchen for the audience to consume. Many of the USCSOMG advisors and mentors were present for the project module presentations, and they were invited to stay for the meal as well.

Considering the difference in this module’s objectives, the schedule for this module was altered to benefit the students as well as the visiting USCSOMG staff and faculty. Below is the proposed schedule for module 10, the student project module. Note, the actual schedule did vary.

Schedule for Module 10, Student Project Module

9:00 - 9:15 AM - Set-up in the Kitchen
9:15 - 10:45 AM - Cooking in the Kitchen
10:45 AM - Finished Plate in “hot box” to go to Lecture Room
10:45 - 12:15 PM - Student Presentations
12:15 - 12:40 PM - Lunch
12:40 - 1:00 - Clean Kitchen

Only one observing researcher completed this observation checklist for the duration of the summer culinary medicine course, and this could be a limitation for this study. Having additional observers complete the observation
checklist to compare responses would have made this assessment tool more powerful for this study.

**Comparative Analysis of the Observation Checklist and Focus Group**

Comparison of the data from the observation checklist and the exit focus group further determines the level of effectiveness of this culinary medicine course. The observation checklist focuses on student engagement and enjoyment, adherence to the planned course schedule, and leftover food at the end of each module. Though leftover food was not a topic mentioned in the focus group, student engagement and enjoyment and adherence to the course schedule were both discussed at length throughout the focus group.

The observation checklist results indicate that adherence to the course schedule improved as the course progressed. In the focus group, students stated they felt as if they became more efficient with their time as the course progressed. Students also acknowledged that the schedule change that occurred in module 5 and continued through module 9 greatly impacted overall time efficiency. The observation checklist results support that the schedule change that occurred in module 5 was beneficial to efficiency of time and overall course schedule adherence. As for student engagement and enjoyment, students frequently mentioned aspects of the course they enjoyed throughout the focus group. As shown in the observation checklist, the focus group findings support that student engagement was high throughout the lecture and lab portions of each module.
Though the observation checklist and focus group both agree that students enjoyed the course and were highly engaged in each section of the course, the focus group also shows the students had suggestions as to how to further improve the culinary medicine course. These suggestions from the focus include changes to the nutrition section and chef demonstration section of each module. The students stated that it would be beneficial to make the nutrition section more interactive with a visual component on the whiteboard rather than reading nutrition facts from a recipe sheet. The students also stated that it would be more interesting for the chef demonstration to include topics such as how to filet a fish or how to remove silverskin from a pork tenderloin rather than vegetable cuts and basic recipe steps. These suggestions were not measured by the ten observation checklist questions; however, these suggestions from the focus group are consistent with additional notes made by the observer recording the observation checklist findings for each module.

Descriptive Analysis of the Feedback Questionnaire

The feedback questionnaire was used to measure the overall satisfaction of the student participants in relation to the culinary medicine course. The feedback questionnaire consisted of ten questions. These questions were scored via a Likert-type scale ranging from 1 to 5. A score of 1 indicated “strongly disagree”, and a score of 5 indicated “strongly agree”. The Feedback Questionnaire consisted of the following questions:

1. There was enough time allotted to each module.
2. The sequence of module presentation was organized and clearly explained.

3. The course location was convenient in relation to your commute.

4. All members of this course worked well together.

5. The time put into this course was beneficial to my career.

6. I would recommend this course to a fellow peer.

7. This course provided a greater understanding of culinary medicine.

8. This course positively influenced my personal dietary habits.

9. I am pleased with the overall quality of this course.

10. I am pleased with the overall content of this course.

All of the students completed the feedback questionnaire within four days of completing the culinary medicine course. The students ranked the majority of the questions as a 4 (agree) or a 5 (strongly agree). The lowest rank given was a 3 (neutral), and this only occurred in two responses. One student ranked the statement “the course location was convenient in relation to your commute” as a 3 (neutral), and another student ranked the statement “this course positively influenced my personal dietary habits” as a 3. Other than these two responses, all other responses were ranked as a 4 (agree) or a 5 (strongly agree). These results indicate all of the students were very satisfied with the overall organization, content, and benefit of this culinary medicine course.

This feedback questionnaire was administered online and student responses were anonymous to reduce the potential of bias. However, since this
was a small participant group, students could have been concerned about the potential of educators and researchers identifying their responses.

**Comparative Analysis of the Quantitative & Qualitative Data**

After in depth review of all quantitative and qualitative aspects of this study, the cooking with a chef survey (CWC), the observation checklist, the focus group, and the feedback questionnaire all reveal co-occurring themes throughout the duration of the culinary medicine summer pilot study course. These co-occurring themes include:

1. Cooking knowledge, attitude & behavior
2. Cooking confidence & self-efficacy
3. The Mediterranean, plant-based diet
4. Timing & Organization of the culinary medicine pilot study course

Each tool used for data collection (CWC survey, observation checklist, focus group, and feedback questionnaire) strongly contributed to the findings of these four co-occurring themes.

Cooking knowledge, attitude, and behavior was measured by all four data collection tools. The CWC survey results indicate an overall improvement in the participants cooking knowledge, attitudes and behaviors. However, throughout the culinary medicine course, participants did show a decreased enjoyment in cooking with an increased frustration related to cooking. The observation checklist demonstrates high levels of participant engagement throughout the course and increased participant knowledge as the course progressed. The
focus group revealed participants' increased interests in cooking technique, knife skills, recipes, food ingredients, and chef demonstrations; all of which pertain to the overall cooking knowledge, attitude, and behavior of the participants. In conjunction with all of these findings, the feedback questionnaire results suggest the following:

1. The participants were pleased with the overall content of this course.
2. The participants viewed this course as beneficial to their career.
3. The participants would recommend this course to a fellow peer.
4. This course did provide a greater understanding of culinary medicine.
5. This course positively changed participant’s personal dietary habits.

Cooking confidence and self-efficacy is another co-occurring theme throughout the culinary medicine course. The cooking with a chef survey revealed significant improvements in cooking confidence and self-efficacy from pre-course survey to post-course survey. When asked questions such as confidence in using knife skills, planning nutritious meals, and preparing foods using fruits or herbs and spices, participants confidence and self-efficacy levels significantly increased from pre-course to post-course. The CWC survey results also showed significant levels of increased confidence and self-efficacy related to specific cooking techniques such as boiling, simmering, steaming, sauteing, poaching, roasting, microwaving, and reusing leftovers for another meal. The observation checklist results are consistent with the CWC findings related to cooking confidence and self-efficacy. The observation checklist results indicate
the participants continued to improve on adhering to the allotted time schedule, specifically in relation to the time they were given to prepare their recipes in the kitchen. Throughout the focus group, participants mentioned what they had learned and their willingness to take this knowledge to the next level and share their knowledge with friends, family, and peers, indicates their increased cooking confidence and self-efficacy. The feedback questionnaire also demonstrates increased cooking confidence and self-efficacy as it relates to participants willingness to recommend this course to a fellow peer, view the course as beneficial to their own career, as well as make personal dietary changes due to the influence of the culinary medicine course.

The Mediterranean diet, a plant-based diet, was another co-occurring theme throughout the entirety of this study. The cooking with a chef survey questions pertaining to fruits, vegetables, spices and herbs, revealed significant increases in confidence and self-efficacy in relation to using these food ingredients when cooking. The observation checklist supports these findings in listing a variety of Mediterranean diet recipes made throughout the course, the students’ feedback about these recipes during the meal section of the course, and the social component of the students during each course module. For example, the observation checklist indicates the following Mediterranean diet recipes that were made throughout the summer culinary medicine pilot course.
In conjunction with the prepared recipes, the students frequently discussed the specific food ingredients and the prepared dishes as they were consuming the food during the meal section of each module. Students often brought up aspects of each dish they did and did not particularly care for, and how patients may respond to these foods as well. It was also interesting to see the social component of the Mediterranean diet at play as well. The Mediterranean diet is largely based on social interactions with friends and family, and this social component was in full effect throughout the culinary medicine course. The focus group, observation checklist, and feedback questionnaire all agree that the students were engaged with one another throughout each module.
The students frequently mentioned they enjoyed working together and spending time with each other throughout the course of the study.

Analysis tools (the observation checklist, focus group, and feedback questionnaire) agree that a fourth co-occurring theme includes the overall timing and organization of this culinary medicine pilot study course. Due to the formative evaluation format of this study, it is to be expected that timing and organization greatly contribute to the overall findings. Though the cooking with a chef survey is not meant to measure aspects of timing and organization, all other analysis tools did measure and assess these components of the study. The observation checklist demonstrates if the schedule was or was not adhered to each day of class, as well as the schedule change that occurred after the fourth class meeting throughout the duration of the course. The observation checklist also indicates that the students and educators improved in adhering to the schedule as course progressed. The focus group and the feedback questionnaire show that the students were satisfied with the overall timing and organization of the culinary medicine course. However, throughout the focus group, the students mentioned changes they would make to the course schedule and course components for overall improvement. The students suggested making changes to the chef demonstration section and the nutrition section of each module in order to gain more knowledge, streamline processes, and better adhere to time constraints.
REFERENCES


CHAPTER FOUR

CONCLUSIONS, IMPLICATIONS, LIMITATIONS & DISCUSSION

Conclusions

Culinary medicine programs are becoming increasingly prevalent, and medical students are an ideal population to participate in such programs. The research presented in this study has demonstrated this culinary medicine pilot program was effective in relation to 1st year medical student’s culinary medicine knowledge, attitudes, behaviors, and confidence in a teaching kitchen. This study has shown 1st year medical students experienced increased levels of self-efficacy related to cooking techniques, produce consumption, and using fruits, vegetables, spices and herbs in recipes as a result of this culinary medicine course. This study’s research findings conclude that the students were highly engaged throughout the duration of the course and overwhelmingly satisfied with the course as a whole.

Implications

Many implications and recommendations can be made based on this study’s research findings. Based on the observation checklist and the exit focus group, one recommendation is making alterations to the nutrition section of the culinary medicine course. Rather than reading nutrition facts from a recipe sheet to note the nutritional value of each recipe prepared for each module, students suggested adding a visual component and/or a more interactive method to
discussing the nutrition section of each module. One student mentioned that the use of a whiteboard or PowerPoint slide could aid in the delivery of the nutrition facts for this section of the module. Students also agreed that relating the nutrition information to the respective module case study patient would be beneficial. For example, if the module case study patient had been diagnosed with Type II Diabetes Mellitus, it would be beneficial to discuss why a high fiber food would be beneficial to this patient.

In addition to these suggestions for the nutrition section of the course modules, the students also expressed their interest in the biochemical aspects of this course related to each module case study. The observation checklist as well as the focus group findings, agree that the students appreciated the biochemical aspects of the case studies. However, the observation checklist and the focus group findings indicate that the course sections (lecture, lab, and nutrition sections) were segmented and separated from one another. For example, the case study patient was discussed in the lecture portion of each module, the students were preparing recipes in the laboratory section of each module, and the students read the recipe nutrition facts from their recipe sheets during the nutrition portion of each module. Rarely did the students talk about the case study patient while they were cooking or while they were discussing the nutrition facts of the food they prepared. These students could certainly piece all of this information together and relate the case study information to the recipes while cooking and discussing the nutritional value of each recipe. However, it would be
of great benefit to prompt the students to think about the nutritional components of the food ingredients in relation to the biochemical and physiological aspects of the case study patient during the laboratory and nutrition sections of each module. Rather than keeping these sections of each module so segmented and separated from one another, it would be highly valuable to take a more a holistic approach to this course, melding each module component into one cohesive patient treatment plan.

The observation checklist and focus group findings also make the implication that the chef demonstrations should include more unique cooking techniques in addition to basic vegetable cuts and recipe descriptions. The students thoroughly enjoyed learning how to cut the bloodline out of a fish for the fish taco recipe and how to remove the silverskin from a pork tenderloin. However, these cooking techniques were not taught in each of the chef demonstrations; often times these more advanced techniques were taught to the individual student responsible for preparing the recipe that included the specific cooking technique. Teaching these unique cooking techniques in the chef demonstrations and aiding individual students with basic techniques when needed may be of benefit to the overall knowledge gained by the students during the culinary medicine course.
Limitations

One limitation to this study is the small sample size of the culinary medicine course participant group. For this pilot study, it would have been difficult to increase the participant sample size.

A second limitation is that there was one focus group for this culinary medicine course. In order to reduce the limitations of this single focus group, culinary medicine course educators and coordinators where asked not to attend the focus group in order to reduce the potential of bias in the students’ responses to the focus group questions.

Only having one observing researcher complete the observation checklist for the duration of the summer culinary medicine course is a fourth limitation. Having additional observers complete the observation checklist to compare responses would have made this assessment tool more powerful for this study.

There are also limitations associated with the participant feedback questionnaire. Though this feedback questionnaire was administered online and student responses were anonymous, student answers could have been influenced by bias. Since this was a small participant group, students could have been concerned about the potential of educators and researchers identifying their responses.

Discussion

This evaluation of 1st year medical students in a culinary medicine teaching kitchen sought to provide evidence of the program’s impact on students’
knowledge, attitudes, behaviors, and confidence related to culinary medicine. To measure the effectiveness of this culinary medicine course, the following assessment tools were used: a cooking with a chef survey (CWC survey), an observation checklist, an exit focus group, and a participant feedback questionnaire. These assessment tools provided both qualitative and quantitative results relating to the effectiveness of this course.

The cooking with a chef survey was used to quantitatively measure cooking attitudes, behaviors, knowledge and confidence of these 1st year medical students pre and post culinary medicine course. The results of this survey supported evidence that this culinary medicine course was effective and impactful in changing the student’s attitudes and behaviors as well as increasing the student’s cooking knowledge and confidence. The observation checklist was used for each course module to assess levels of student engagement and enjoyment, adherence to the planned course schedule, and amounts of leftover food at the end of each module. The findings from the observation checklist showed that student engagement was high throughout the duration of the course. This observation tool also revealed that adherence to the planned course schedule improved as the course progressed, and that restructuring the schedule for modules 5 through 9 was time effective.

The exit focus group was used as an evaluation tool to gather qualitative data to further inform the findings from the CWC survey and the observation checklist. The focus group findings provided a number of common, recurring
themes that further inform the findings from the CWC survey and the observation checklist. The common, recurring themes and topics throughout the focus group include recipe sharing, cooking technique, the nutrition section of the curriculum, enjoyment of working together, encouraging patients to eat healthier, student dietary changes during the summer pilot study, science basis in relation to curriculum case studies, food ingredients, timing and organization of the overall pilot study course, and recipe preferences. The findings of the focus group support the evidence found from the CWC survey showing that student attitudes and behaviors did change throughout the duration of the culinary medicine course as well as the findings that the student’s cooking knowledge and confidence increased from pre to post course. When comparing the focus group findings to the observation checklist findings, these two assessment tools support one another. As recorded with the observation checklist, the focus group revealed that the students did enjoy the culinary medicine course and remained highly engaged throughout the duration of the course. The focus group also identified suggested changes to the nutrition section and the chef demo portions of each module, and these suggested changes are supported by the findings in the notes of the observation checklist.

Lastly, the participant feedback questionnaire was used to measure levels of student satisfaction with the culinary medicine course as a whole. In support of all other evaluation tools used, the participant feedback questionnaire findings
show that the students were overwhelmingly satisfied with the culinary medicine course.

The findings of this study support and add to the current preventive and lifestyle health measures encouraged by the medicinal, nutrition, and culinary fields. The World Health Organization predicts that two-thirds of all disease around the globe will be the result of lifestyle choices by the year 2020 (Chopra, 2002). In efforts to combat such disease related to lifestyle choices, the fields of medicine, nutrition and culinary are making great pushes to educate practitioners and patients on how to take preventive measures. Adopting the mentality of “train the trainer” has allowed programs such as the Goldring Center for Culinary Medicine to become part of more than 50 medical schools in the United States. Programs such as this culinary medicine course are exponentially propelling nutrition and culinary education and awareness in the field of healthcare.
REFERENCES


5. The Goldring Center for Culinary Medicine. GCCM first and second year medical student curriculum. Tulane University School of Medicine. Published 2016.


# Appendix A

## Cooking With A Chef Survey

### DIRECTIONS: This section is about the presence of fruits and vegetables in your house during the past week. Please circle YES or NO for EACH question.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did you have pure (100%) fruit juice in your home last week?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. Did you have fresh fruit in your home last week?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. Did you have raw or cooked vegetables in your home last week?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. Did you have salad in your home last week?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. In the last week, were fruit and vegetables on the kitchen counter or somewhere in the open?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6. In the last week, was 100% fruit juice or cut up fresh fruit on the front shelf of the refrigerator as a snack?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7. In the last week, were cut up fresh vegetables on the front shelf of the refrigerator as a snack?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8. In the last week, were vegetables in the refrigerator prepared so they readily could be used in a meal?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### DIRECTIONS: For each item below, indicate the extent to which you agree or disagree with the statement about cooking.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. I do NOT like to cook because it takes too much time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Preparing meals at home would NOT improve the health of my diet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Cooking meals is a good use of my time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12. I enjoy cooking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. It is important to know how to prepare food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Cooking is fun.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I do NOT like to prepare meals at home because it costs too much money.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. It is NOT important that I know how to cook.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17. Cooking is interesting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18. Meals made at home are affordable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. It is important to eat the recommended 2 cups of fruit each day.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Neither agree nor disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
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<td>----------</td>
<td>---------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>20. It is important to eat the recommended 2 1/2 cups of vegetables each day.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. It is easy to prepare meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Cooking is frustrating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I like trying new recipes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. It is too much work to cook.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Making meals at home helps me to eat more healthfully.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I find cooking tiring.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DIRECTIONS:** For the 3 items below, think about your usual cooking habits. Select ONE box for EACH question.

<table>
<thead>
<tr>
<th>During the past month how often did you do the following?</th>
<th>Not at all</th>
<th>1 to 2 times this month</th>
<th>Once a week</th>
<th>Several times each week</th>
<th>About everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. Prepare meals from basic ingredients (such as whole fresh produce, raw chicken, etc).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Prepare meals using convenience items (such as bagged salad, prepared mashed potatoes, pre-shredded carrots, deli rotisserie chicken).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Reheat or use leftovers in another meal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**DIRECTIONS:** For each item below, indicate the extent to which you feel confident about performing the particular activity. Select ONE box for EACH question.

<table>
<thead>
<tr>
<th></th>
<th>NOT at all confident</th>
<th>NOT very confident</th>
<th>Neither confident nor unconfident</th>
<th>Confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.</td>
<td>Eat fruits and vegetables at every meal, every day</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>31.</td>
<td>Eat fruits or vegetables as a snack, even if everybody else were eating other snacks</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>32.</td>
<td>Eat the recommended 9 half cup servings of fruits and vegetables each day</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>33.</td>
<td>Cook from basic ingredients (ex: whole lettuce heads, fresh tomatoes, raw chicken)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>34.</td>
<td>Follow a written recipe (ex: preparing fresh salsa from tomatoes, onion, garlic, jalapeno peppers)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>35.</td>
<td>Prepare dinner from items you currently have in your pantry and refrigerator</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>36.</td>
<td>Use knife skills in the kitchen.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>37.</td>
<td>Plan nutritious meals.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>38.</td>
<td>Use basic cooking techniques.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
### DIRECTIONS: For each item below, indicate the extent to which you feel confident about performing the particular activity. Select ONE box for EACH question.

<table>
<thead>
<tr>
<th></th>
<th>NOT at all confident</th>
<th>NOT very confident</th>
<th>Neither confident nor unconfident</th>
<th>Confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>39. Boiling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40. Simmering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. Steaming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. Deep frying</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43. Sautéing</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>44. Stir-frying</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>45. Grilling</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>46. Pouching</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>47. Baking</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>48. Roasting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49. Stewing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50. Microwaving</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51. Reusing leftovers for another meal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DIRECTIONS: For each item below, indicate the extent to which you currently feel confident about preparing the following foods. Select ONE box for EACH question.

<table>
<thead>
<tr>
<th></th>
<th>NOT at all confident</th>
<th>NOT very confident</th>
<th>Neither confident nor unconfident</th>
<th>Confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>52. Fresh or frozen green vegetables (ex: broccoli, spinach)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53. Root vegetables (ex: potatoes, beets, sweet potatoes)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54. Fruit (ex: peaches, watermelon)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55. Herbs and spices (ex: basil, thyme, cayenne pepper)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DIRECTIONS: For questions 56-61 below, indicate what you believe is the best answer by checking the box next to your response. Select ONE answer for EACH question.

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Answers</th>
</tr>
</thead>
</table>
| 56.      | Cooking peaches briefly in boiling water then cooling in ice water to remove the skins is an example of: | - Blanching  
- Poaching  
- Broiling  
- Don’t know |
| 57.      | If a recipe tells you to sauté an onion, you should cook it: | - In a basket set above boiling water.  
- In a pan with a small amount of hot oil.  
- In a pan with a small amount of water.  
- Don’t know. |
| 58.      | A diced potato should be cut into: | - Long, thin matchstick size pieces.  
- Very small and uneven pieces.  
- Cubes usually \( \frac{3}{4} \) to \( \frac{3}{4} \) inch in size.  
- Don’t know. |
| 59.      | Water is simmering when: | - Steam begins to form.  
- Tiny bubbles collect on the bottom and sides of the pan.  
- Bubbles rise rapidly and break on the surface.  
- Don’t know. |
| 60.      | Sweet potatoes are roasting when they are: | - Cooked by dry heat in a hot oven.  
- Cooked in a hot oven with liquid in the pan.  
- Cooked in a covered pan with a small amount of liquid.  
- Don’t know. |
| 61.      | What is the term for preparing all ingredients, gathering equipment, and organizing your work area before beginning to cook? | - Production stage  
- Blanching  
- Mise en place  
- Don’t know |
**DIRECTIONS:** For questions 62-63 use the following recipe to indicate what you believe is the best answer. Please select ONE answer by checking the box next to your response.

<table>
<thead>
<tr>
<th>Orange Smoothie</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup fat free vanilla yogurt</td>
</tr>
<tr>
<td>½ cup sweet potatoes, cooked, cooled and mashed</td>
</tr>
<tr>
<td>1 cup orange juice</td>
</tr>
<tr>
<td>½ tsp vanilla extract</td>
</tr>
<tr>
<td>1 cup ice</td>
</tr>
</tbody>
</table>

In a blender, crush ice. Add remaining ingredients and blend on high until smooth. Serve immediately.

**Yield: 2 smoothies.**

**62.** To accurately measure ¾ cup of orange juice for this recipe:

- Set a liquid measuring cup on a level surface, bend down and pour in the juice to the desired level
- Hold a dry measuring cup at eye level and pour in juice from another container to the desired level
- Set a dry measuring cup on a level surface, bend down and pour the juice to the desired level
- Don’t know

**63.** Which is best for measuring the vanilla extract in this recipe?

- ![Measuring Spoon](https://via.placeholder.com/15)
- ![Measuring Cup](https://via.placeholder.com/15)
- Don’t know

**64-71.** Please select the THREE (3) most important sources of where you get ideas for family meals.

- Family preferences
- Cookbooks or magazines
- Television cooking shows
- Exercise clubs or YMCA
- Chefs
- Supermarkets
- Friends or co-workers
- Doctor, pediatrician, nurse, dietitian
## Appendix B

**Culinary Medicine Curriculum Delivery Observation Checklist**

<table>
<thead>
<tr>
<th>Culinary Medicine Curriculum Delivery Observation Checklist</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Module Name:</td>
<td></td>
</tr>
</tbody>
</table>

### Questions

<table>
<thead>
<tr>
<th>Rank 1-5 (1 indicates not at all, 5 indicates extremely)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.1 Are the students engaged in this module’s lecture section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.2 Are the students engaged in this module’s laboratory section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.3 Do the students seem to enjoy eating the food they cooked in lab?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.4 Are the students engaged in this module’s discussion section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.5 Is there enough time allotted for this module’s kitchen preparation?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.6 Is there enough time allotted for this module’s lecture section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.7 Is there enough time allotted for this module’s laboratory section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.8 Is there enough time allotted for this module’s discussion section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.9 Is there enough time allotted for this module’s clean-up section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.10 Is there an excess amount of food leftover at the end of this module section?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Additional Columns

- **Notes**
- **Planned Schedule**
- **Recipes Made**
- **Actual Schedule**
Appendix C

Culinary Medicine Exit Focus Group Transcription

This culinary medicine exit focus group took place at the University of South Carolina Medical School of Greenville campus. The exit focus group was held in a conference room on campus. All of the student participants, the student researcher of this study, and a research advisor attended the exit focus group. The student researcher conducted the exit focus group, and the research advisor took notes throughout the duration of the focus group. Instructors of the culinary medicine program did not attend the exit focus group in order to decrease the likelihood of students giving biased feedback.

The focus group began at 10:10 AM and ended at 10:55 AM. The focus group took place four days after the students had completed the last culinary medicine module of the summer pilot study. The entire focus group was audio recorded for future reference and transcription purposes. Each student was assigned a unique identification number (1-5) to effectively identify the students’ responses to the focus group questions. This allowed researchers to group and cluster the students’ feedback and determine common recurring themes throughout the focus group.

The following pages include the transcription of the focus group, including the questions the students were asked and the student responses.
**Question 1:** Have you recreated any of the Culinary Medicine Curriculum recipes at home? What recipes have you recreated? Tell about the recreating process.

Student 1 stated they had not recreated any recipes, but intend to do so.

Students 2, 3, 4, & 5 stated they had recreated recipes.

Student 3 recreated the tofu scramble similar to how it was prepared in class, but used other vegetables, and used what they had in the refrigerator.

Student 4 recreated the eggplant ratatouille, the mango salsa, the Thai peanut sauce, and the fish tacos. Student 4 stated recipes were recreated very similar to how they were made in class. Student 4 did not go out of the way to buy ingredients that did not seem to matter (i.e. cilantro).

Student 5 did not remember which recipes they had recreated. “I know I have all of the recipes in folders for each module. When family or friends ask for recipes I send them out.”

Student 2 also had distributed some recipes to family members. They recreated the cauliflower mac & cheese recipe. Student 2 used more cheese when recreating the recipe. Student 2 recreated another recipe, but could not remember which one. “I know for sure it has modified how I cook. For instance, we buy a ton more zucchinis now. We put zucchini in pretty much everything, and lentils.”

When asked if family and friends seemed to enjoy the recreated recipes, all students stated “yes”.

**Question 2:** Share a recipe from the Culinary Medicine course you would want to recommend to others pursuing a Mediterranean diet. What is it about the recipe you want to share?

Student 4 said they would share the mango salsa recipe. Student 4 stated they liked that the recipe incorporates multiple servings of fruit. “Vegetables are easier to incorporate into the diet than fruit.”

Student 3 said they would share the spaghetti and lentils recipe. “It was really good and it is much healthier than the traditional spaghetti with meat sauce, more fiber and vegetables, less saturated fat.”
Student 1 said they would share the shrimp quinoa. They said this recipe “felt fancy”, and it could be made for a holiday. “It was really good, and not hard to make.”

Student 2 also said they would share the shrimp quinoa recipe.

Student 5 mentioned the portabella mushroom burger as a good recipe to share with others. Student 5 looked through the list of recipes made in the summer culinary medicine class... The student mentioned black bean burgers, eggplant ratatouille (“interesting because I have made ratatouille on my own, but I think the more traditional approach where you cut everything at the exact sizes, lay them in a pattern, and make it really fancy. So that was neat because it showed how simple it can be. When I make it, it takes an hour and a half…”), and tofu scramble (“I made it in class twice. It was really good, the tofu was mashed up in such a way that really resembled scrambled eggs. It had a lot of turmeric, good spices, things like that that I really enjoyed. I could see myself recreating it at home.”)

Student 5 also mentioned the smoothies made in class. All other students agreed. All students indicated they liked the avocado smoothie and the kiwi pineapple smoothie. The kiwi pineapple smoothie contained coconut milk, Student 1 commented that most patients may not purchase coconut milk; thinking of lower income patients with kids.

Students 1 and 4 also mentioned the coconut pecan date balls that were made in class. Student 4 stated “the coconut date balls were the most expensive recipe made in class”, but also stated how good the recipe was. Student 4 went on to say this recipe called for the “most expensive nut, and the most expensive whole fruit: dates.”

**Question 3:** After this summer’s culinary medicine course, how would you reduce the amount of salt listed in a recipe and maintain adequate flavor?

Student 5: I learned a lot of new things like bringing out natural flavors; “I have completely kicked salt out of my diet, at least added salt”. Vinegars increase acidity to bring out flavor and replace salinity. For sweetness, for fatty flavor... I can't remember, but there were a lot of things we did. For instance yesterday in my chili, I had you (pointing at someone else in the room) taste it, a lot of other people taste it, and most of the feedback I was getting was it needs more flavor, there’s not enough salt. Chef even said I would put a little salt in there. I ended up putting a sprinkle of slat, but I put oregano, I put black pepper, I put red pepper flakes, I put cumin, I put one other thing... garlic powder.
Student 1 found their culinary medicine handout with the list of salt and sugar substitution suggestions.

Student 5 looked at Student 1’s handout and briefly read the information out loud... “Umami flavor, add tomato products, soy sauce (mentioned high sodium content), fish sauce, liquid aminos (looks like soy sauce, Student 4 stated it is like whey protein but in a liquid form. Student 5 stated, unless you are eating a very small amount of protein, you do not need this product, you have plenty of protein.), liquid smoke. For sweet stuff, I know we placed added sugar with honey. Honey is a better form of sugar, we also used dried fruit as a sugar replacement in class.”

Students briefly discussed student 5 cutting salt out of his diet. The student researcher asked “You have cut salt out of your diet since this summer culinary medicine class has started, right?” Student 5 said “yes, it was hard at first.”

Student 2 said they had a more informal list of what student 5 said. Instead of adding salt, student 2 added whatever spices they had in the house and replace the salt with other spices. Student 2 said they “use a lot of pepper and cumin, then it doesn’t need salt anymore.”

Student 5: “Prior to coming into this course, I had the misconception that a lot of the media posed or even the scientifically posed salt content (diet high in salt) causes hypertension, I was really skeptical of that because there is a lot of data, and in the literature, in meta analyses and systematic reviews, that say if you do not have a diagnosis of hypertension, it does not matter how much salt is in your diet.”

Student 1 responded to student 5 with: “Genetic as well, if you are not a hyper-responder to salt, it doesn’t matter.”

Student 5: “Right, and same with cholesterol; dietary cholesterol has been shown to not really be bad unless you have the genetic component where you have dietary cholesterol and your cholesterol goes through the roof. So I think this course helped because it gave a lot of the relevant articles... it really made that a lot more clear and it helped me to reduce my sodium. And the cool thing about that…. Any time I have had my blood pressure checked it has been high, it is always borderline, and I just thought it was due to white coat syndrome or maybe I am really energetic. It was always in the 130s systolic, and now, since I have taken salt out of my diet, I am now at 115/70 mmHg regularly.”
**Question 4:** From this summer’s culinary medicine course, were there any recipes you did not like? If so, please name one. What did you not like about it?

Student 1 stated: “banana nut muffin”

Student 4 responded to student 1: “it was so good, you are so hard on yourself.”

Student 1 responded: “I didn’t like it, I though it just tasted like flour. I didn’t get any other flavors.”

Student 3 stated: “The parfait that I made; it [called for] non-fat plain yogurt, and I think the sourness of the plain yogurt that I used, I just [did not] like it very much.”

Student 4 responded “I don’t think I like it too much either. I agree.”

Student 2 stated: “The ranch dressing; when we used the yogurt substitute, [it did not taste bad, but] once again, I have said this to my classmates before, it is hard to think of it as a substitute for something else. If I look at it as a yogurt dressing, then I think ‘hmm, this is pretty good’, But if I look at it as [a substitute] instead of the ranch, then it’s not good.”

Student 4 responded: “It didn’t taste at all like ranch, and I felt that [way about other recipes]... everybody else [really liked] the cauliflower mac and cheese; It tasted good, [but] I don’t know what you are doing putting the word ‘macaroni’ in it. You know what I mean? To me, it’s just a different dish. And I felt that way a lot. It tastes good, [but] I would still prefer mac and cheese if I want mac and cheese. It seems like we are trying to substitute [recipes] and it was just a good dish, it was not a substitute.

Student researcher responded to student 4: “this is important when communicating with patients... rather than suggesting foods as substitutions, have patients incorporate new recipes into their diet and rather than view it as a substitute. It would be interesting to look at studies and see if psychologically patients would be more willing to stick to [a diet] if they were not viewing it as [a number of substitutions].”

**Question 5:** Do you have suggestions for the time allotted to each section of the modules? What suggestions do you have?

a. What needs to be changed? What should remain the same?
b. What did work well? What did not work well?
c. What will these changes bring to the Culinary Medicine course?
Student 3 stated: “I thought we did pretty good.”

Student 1 stated: “I liked it.”

Student 5 stated: “[yes], because we started out different from how we currently have it. We would come back and wrap up the case [study], and I think as we adapted and sort of changed that, I would not change a single thing.”

Student 2 stated: “I think the only thing I would add, is when [the chef] did his demos; they were very helpful, and I am not exactly sure how it happened, but I would watch the clock, and on certain days [the chef] was very efficient and streamlined and would get done in 10 minutes, and then we would be able to get into the kitchen. Other days, I don’t know where the time went, but all of a sudden I would look up and it would be [about] 20 minutes and we were just sitting there. I don’t know what was going… So to streamline [the chef demonstrations] to keep it at 10-15 minutes as scheduled, I think helps.”

Student 5 responded: “I agree.”

Student 4 responded: “[The chef demonstrations] are great, in particular when we are looking at something that we haven’t seen before. I struggle with mangos and always have, so watching him chop up a mango was really helpful. It was just nice to watch how he does it… he doesn’t need to go over every single recipe when, in his own words, ‘you guys know how to do this’.”

Student 1 responded: “I would actually like to have had a little bit more content. Just learning some new things. Even though I might not be able to tell patients about these new things, just for personal gain. I learned a [lot], but [focusing on] knife skills and cooking techniques” in the chef demo would be beneficial.

Student 4 responded: “we ask [the chef] a [lot] of questions and it is always so helpful. I feel like I asked more questions [about topics that are] not about the course than I have about the course.”

Student 1 responded: “yes, [the chef] has definitely been a great resource. Just being in the environment, I just want to get the most out of it.”

Student researcher mentioned the module schedule and time frame in relation to the lag time between the lecture section and the chef demonstration. Asking students, “would it be more beneficial to have a scheduled 5 minute break and start the chef demonstration right on schedule?”
Student 5 responded: “A lot of times during the 10 minutes between lecture and [the chef demonstration] we are getting everything for our mis en place. And then that is when chef would say ‘okay, 3 minutes until demo’. But maybe having a defined period of time… and then [the chef demonstration] starts.”

Student 1 responded: “Sometimes [the chef] was trying to reign us in, so I think that would help.”

Student researcher: “Would it be beneficial to have a little more structure during the time allotted to mis en place specifically?”

All students agreed that it would be helpful to have more structure during this 10 minute window of the course between lecture and the chef demonstration.

Student 4 responded: “And we can get better at that. Mis en place can be part of the 10 minute break. I don’t know what people were doing during the breaks. Maybe going to the bathroom or changing, but then you come in and start getting your [cleaning] buckets ready. That is sort of our break.”

Student 5 responded: “I think having the schedule loose was nice. I didn’t feel like I would be yelled at if I went to the restroom, and I liked having freedom and just the individual autonomy of the course.”

Student 4 responded: “sometimes it takes time to have a schedule. You know, sometimes it takes 5 minutes to talk about the schedule. Sometimes we can just keep moving, and we know what to do.”

Student researcher: Referring back to the discussion of the [chef demonstrations] and asking the students “do you think it would be better to focus on culinary techniques and skills and if the students have specific questions, just call [the chef] over to your personal station?”

Student 4 & 5 responded: “Yes, I think that would be helpful.” All students agreed that it would be more helpful and more interesting to see techniques such as cutting the bloodline out of the fish and taking the fascia off of the pork loin.

Student 2 stated: “It blew my mind when [the chef] showed us how to cut the peppers; to cut them in half and take out all of the seeds.” Others students agreed.

Student 4 stated: “Cutting an onion too.”
Question 6: Do you have suggestions for the improvement of the case exercise (lecture) section of the course?

a. What needs to be changed? What should remain the same?

b. What did work well? What did not work well?

c. What will these changes bring to the Culinary Medicine course?

Student 1 stated: “I just want to reaffirm that I like pulling biochemistry back into it because that is going to help us a lot and make this extra beneficial just for studying and what not.”

Student 5 responded: “Yes, I will second that because one of my personal goals for the summer was to at least review a couple things from M1, and I probably would have never done that. But having this course and having biochemistry questions built in a little bit was great. I also will say, I like the flexibility of our cases. For instance, we almost never finished one [case study], but we were able to go off on tangents and talk about anything we were interested in, and I think that was by far more beneficial than keeping it ridged and saying ‘you have to answer these questions’.”

Student 4 responded: “You are always better off learning one thing really well, always. I think it is nice too [that the curriculum] keeps hammering home [content] we find incredibly annoying; like ‘how many grams of protein would you recommend for this person for breakfast’, and we have to keep looking up [the answers to these questions]. [However,] it hammers home things that are necessary for us to learn. Obviously in real practice, maybe we will have charts that will help us with that information, but it is still nice if we just know [the information] off the top of our heads; it just makes us look [much] smarter.”

Student researcher: “Did you guys like talking about the case studies and working together as a group rather than individually?”

Student 5 responded: “I think it is preparing us for residency or even rotations as well. When you are in internal medicine, this is what you are going to do. You are going to be talking with your colleagues discussing patient cases, pathology, diagnoses… so I think it was beneficial just for that purpose as well.”

Student researcher: “Did you feel as if there was enough time allotted to the case study section?”

All students agreed: “Yes, there was enough time for the case study section.”

Student 1 stated: “I thought it was perfect. We didn’t quite [finish the case studies], but there wasn’t every any lull.”
**Question 7: Do you have any suggestions for the improvement of the cooking (laboratory) section of the course?**

a. What needs to be changed? What should remain the same?
b. What did work well? What did not work well?
c. What will these changes bring to the Culinary Medicine course?

Student 1 stated: “I said mine already. That is the only thing I would add.”

Student 3 stated: “Independent of what we talked about with the [chef demonstrations], I think everything else was pretty good.”

Student 4 stated: “Clone [the lab assistant provided by Greenville Technical College(GTC)].”

Student 1 responded: “Oh, for sure.” Other students agreed… “[the GTC lab assistant] was amazing.”

Student researcher: “What do you guys think [the course] would have looked like without [the GTC lab assistant]?”

All students laughed.

Student 1 responded: “Even [the chef] would say ‘you need to go ask [the GTC lab assistant].’”

Student 4 laughingly responded: “I haven’t turned on an oven yet; they confuse me.” – [The GTC lab assistant] always had the ovens turned on and labeled with temperatures and what food was supposed to be cooked in each oven.

Student 5 responded: “So I don’t know, for instance, if you (referring to the student researcher) are going to be doing this again next year for the next students, probably not. But I would say have another you (referring to the student researcher) essentially would be… you were so helpful. [The GTC lab assistant] was great because she prepared a lot of stuff on the forefront, but she was also running around busy, where as you (referring to the student researcher) and [the USCSOMG assistant] were available just to kind of help with random odds and ends. That made or broke my time, so that was super helpful.”

Student 4 responded: “I agree.”

Student 3 responded: “Any random chopping we needed to do, or any peeling we needed to do, and you guys (referring to the student researcher and the USCSOMG assistant) helped with.”
Student researcher: “There were some days one of you, or two or three of you, may not have had that much to do, but it seemed like every day at least one or two people had a lot to do. It was really hard [for those one or two] to get everything done. As the classes get bigger, the students may be paired in twos and this may help with the time factor.”

Student researcher: “Did you guys like working individually, or would it have been more fun or more beneficial to pair up?”

Student 1: “I kind of ended up splitting recipes whenever we paired up. We are all pretty helpful with each other anyways, I think.”

Student 5 asked: “The question was just whether or not to split up or pair together?”

Student researcher: “yes, I just asked ‘did you guys prefer to work individually on your recipes or work as a team of two on your recipes?’”

Student 5 responded: “I would say either or. I didn’t have a preference either way. I think rotating through was helpful just to keep novelty there.”

Student researcher: “By that you mean one day you were on your own, the next day you were paired with someone else?”

Student 5 responded: “Yes, right. And it was just fair, nobody got special treatment.”

Student 3 stated: “I had like four.” – meaning they were paired with another student at least four times.

Student 1 stated: “I was paired up a lot tool. I don’t remember how many times.”

Student 3 stated: “It seemed like [student 4] wasn’t paired up.”

Student 4 responded: “Nope. Well, I was paired up with [student 5] on the very first [module] and all I had to do was make salad dressing. It was great.”

Student 5 said: “I don’t even remember what I made that day.”

Student 4 said: “You made a white pasta with nothing else in it. It was an onion, white pasta and tomato sauce, and that was all you did.”

Student 2 laughingly stated: “And that took us the whole time.” Other students laughed.
Question 8: Do you have any suggestions for the improvement of the nutrition review and meal section of the course?

a. What needs to be changed? What should remain the same?

b. What did work well? What did not work well?

c. What will these changes bring to the Culinary Medicine course?

Student researcher: “We can talk about the nutrition review and meal section separately. Do you guys have any suggestions for the nutrition review section of each module?”

Student 2 stated: “You know, I don’t know what to do differently, but I feel like it does need to be done differently because essentially, I just read the nutrition facts back to everyone.”

All other students agreed.

Student 1: “Yes.”

Student 4: “And it took forever and all we were doing was reading [the nutrition facts].”

Student 1: “I didn’t always comprehend it. I wasn’t listening as well I should have.”

Student 5: “Yes, somebody would finish and I would think ‘I didn’t hear any of that.”

Student 1: “Like when somebody, was it you (referring to student 5) who said this [recipe] has 400 calories and everybody just nodded their head.” – referring to a spinach salad recipe that contained very few calories. Student 1’s point was that the other students were very passively listening to the nutrition fact presentations.

Student 5: “Yes, and it was [about] one ounce of spinach. So yeah, there has got to be a better way somehow.”

Student 4: “I am thinking relate it to the case [studies] more. The person has hypertension, we are talking about the DASH diet, or whatever. Relate that to the patient. ‘Is this something the patient would like to eat, why would this be beneficial for the patient’, and then run through the nutrition facts really quick. I also think there is a lot of time taken when everyone is saying ‘oh, that looks good, and that looks good’…. which is great, but I want to eat it.”
Student 3 responded: “We can do that during the meal”.

Student 4: “I know [the course instructor] is busy, and did not see us make [the recipes], so they want to ask us questions about [how the recipes were made]. But just to streamline it… we were taking a long time.”

Student 2: “Sometimes we would be there for 20 minutes.” – referring to the amount of time spent standing around the prepared food during the nutrition portion of each module.

Student 1: “We were so hungry.”

Student 5: “Let’s just eat.”

Student 2: “Maybe that is something, I hate to add another thing in to prolong the time, but if you are doing it in the context of the case [studies]… What would you have to teach a patient for them to know what to do. Knowing all of these recipes was only easy after I learned how to use a knife. That basic skill of ‘oh, I’m not using a steak knife to cut my vegetables’ just made everything else flow and easy. And if it is how we need to teach our patients or mention [certain] knife skills, or how to take the vein out of fish. Like I said, I don’t want to add more things in, but maybe if we are going to relate the [nutrition section] to the case [studies], maybe we can include the nutrition facts and the [cooking] techniques.”

Student 5: “And that can be shared during the [chef demonstration]. That is ideally what I would like to see in the [chef demonstration], more technique. That is what I would walk away with as knowledge that I would take home. Even though I didn’t replicate a lot of the recipes that we [made], I replicated a [lot] of the techniques that we learned, just making my own dishes. I would say that would be a big thing. Also, a lot… I just remember I would be standing next to [student 1], and as [they were] reading I would peak over at [the nutrition facts] list because I am so much more visual, and it was so helpful to see the numbers as you were reading them. So maybe even have the nutrition facts on the white board so we can all see, whether we write them up or just stick them up on the white board. I think it is more beneficial to see because then I hear what you are saying but I also have a visual aid.”

Student 4: “Something I just came up with listening to you [student 5]; it would be nice if [the course instructor] was teaching us while that is happening. We are reading the nutrition facts and that is great, but for someone who has hypertension, nothing really matters except for the sodium and the saturated fat, and all that. So [the course instructor] could explain why the fiber would be important. ‘Why is this something that is good for the patient?’ [The course...}
instructor] could also say, ‘there is also Vitamin A, and Vitamin A is good because of this. And that would help us. We are all looking at nutrition facts, but just point out how this relates to the case [studies].”

Student researcher: “So maybe incorporate a little more biochemistry and physiology into thee nutrition facts section.”

Student 4: “Yes. Like with the pediatric diet, [the course instructor] did that. [The course instructor] asked, ‘would kids eat this?’ Combine that with those questions, the more realistic questions. ‘Would the 55 year old guy make the fish tacos?’ Yeah, he might. ‘Why would he make them?’ Oh it only took half an hour, and he likes to fish…. Relating that and then combining that with the ‘and its good for you because, fiber, saturated fat, cholesterol, sodium, Vitamin C…”

Student researcher: “And here is what that would do for a hypertensive patient.”

Student 4: “Exactly. And it might be where one of the recipes is pretty stand alone. If we have a salad, you know, everyone knows the nutrition facts of the salad. It just seems like there could be a way to streamline that and have it more direct as opposed to us just reading the nutrition facts. We actually get tested on it.”

Student 5: “Although, I was surprised at how low the fiber content was of salads.”

Student 4: “It is surprising.”

Student 5: “That kind of stuff is neat to learn. Otherwise, I feel like I would just be like, eat a salad and increase your fiber, but that’s not always the case.

Student 4: “It’s all about beans.”

Research advisor: “I think that is what you want to call your thesis, ‘it’s all about beans.”

Everyone laughed

Student researcher: “Okay, and so that is the nutrition review aspect; what about the meal section? We typically took 30, sometimes even 40, minutes to eat. Is there anything, again not necessarily pertaining to time, anything you guys have… suggestions?”

Student 4: “I thought it was great.”

Student 2: “I thought it was good.”
Student 1: “I liked how we would talk about it.”

Student 4: “I loved sitting with you guys and eating, it was really nice.”

Student 3: “Kind of like a good cool down, wrapping up, relax after.”

Student 1: “And if you had questions… you could ask it.”

Student 3: “And [the chef and course instructor] were there, and you guys were there, so we could talk to you guys about it too. I don’t think I would change that.”

Student 5: “I think having the longer time was helpful too, because I could take my time and digest my food before running around and cleaning the kitchen.”

Student 3: “And you could get seconds and thirds and what not.”

Student 4: “The plates were small.” Other students laughed

Student researcher: “Do you guys feel as if incorporating a more of nutrition discussion into the meal should be a little more structured or not necessarily?”

Student 2: “I would be interested to try it once. I really did enjoy the unstructured, like we could ask questions, we just talked about life, and it was a very good unwinding from the pressures of the kitchen. However, just because of the time constraint, it would be interesting just to try one day, maybe two days, of the things that we talked about like in the nutrition facts where [the course instructor] is asking us questions. If we just did part of that maybe while we were eating. Once again, I don’t really want to go all the way to that because I really did enjoy that unstructured time, but it would be something that we could see if it did work out, and if it didn’t then… I don’t know, I would want to see it before I would recommend that.”

Student researcher: “Maybe just as an informal discussion piece or something like that?”

Student 2: “Yeah.”

Student researcher: “Okay, do you guys have any other suggestions for the course overall? Anything that you think would improve it, that would help it be more practical?”

Student 5: “Just totally random, I’m curious as to what you guys think, but when we are doing the nutrition facts part, if everybody is given a taste spoon, and we are all trying it when the person is reading the nutrition facts. No idea if that
would work, but it would just be fun to try. Plus it would satisfy some of the cravings that we’re all feeling at that time.”

Student 1: “Yeah.”

Student 4: “So many more dishes [to clean].” Other students laugh

Student 1: “I think towards the end we also kind of slacked on doing portion sizes for all of the recipes, so I think staying with that because it is really helpful to see it on a plate.”

Multiple students agree they missed several plated portion sizes toward the end.

Student researcher: “It is helpful to have that visual, because sometimes it is a lot less than you would think, and sometimes it is way more…. And then also for your patient, just thinking about that relative to the size of the plate. [Someone] mentioned this [early in the course]; [they] have gone to a smaller plate instead of their plate looking empty, and [they] said that this has really helped them with portion control. I agree, no one wants an empty plate, but if it’s a smaller plate that is full then [we seem to be more satisfied].”

Student Researcher: “Awesome, well that is all of the questions I have for you guys. If you have any other thoughts or feedback or anything, we still have about 12 minutes until 11:00 AM, so if guys have anything you want to add, [please do so].

Student 2: “This was specifically for the cooking class, not for the module as a whole?”

Student researcher: “Yes, I mean, it’s for the culinary medicine course, [just] this summer is what we are focusing on.”

Student 4: “I know where you are headed, we will get to that.”

Student researcher: “But as far as the [culinary medicine] curriculum, and things like that, not necessarily.”

Student 5: “What were you going to say about the [culinary medicine] curriculum?”

Student 2: “Nothing about the [culinary medicine] curriculum.”

Student 5: “Oh, okay. I think I know where you were going with that.”
Student 2: “Yeah, I was thinking about other things.”

Student 5: “We are all on the same page.”

Student 1: “Are we? I am thinking about some misspellings and mistakes. That is what I was thinking. They just had mistakes in some recipes and some of the quizzes did not match up.”

Student 2: “Oh, that is actually a good thing to mention.”

Student researcher: “Yes, I think [the course instructor] picked up on that and I think [it has been discussed with those who created the curriculum] as well. But yes, definitely good to know.”

Student 4: “No, [student 2] is talking about scheduling. Scheduling has been tricky.”

Student 1: “That pertains to this though.”

Student 4: “This has been Tuesday, Thursday though.”

Student 1: “I see, I see.”

Student 4: “We will work on that.”

Student researcher: “Okay.”

Student 3: “I think the biggest thing is the demo and the nutrition facts. I think those can use the most work. If I were to pick a major take away. I did like their idea though, even if it would take longer to start incorporating practical applications rather than reading out nutrition facts. If you can do that combined with a visual of the nutrition facts, then it would probably be much more helpful.”

Student 2: “You know, with that idea, in every module there were the patient handout folders, which I did not look at every time because they were not required reading and we did not really do anything with them. But occasionally I would see a title and I would click on it, and it would be this amazing document with all of this helpful information.”

Student 1: “I have never seen those.”

Student 5: “I was going to say, I have never opened one. I downloaded all of them, but never opened them.”
Student 4: “I have no idea what you are talking about.”

Student 1: “Awesome”… while looking at one of the documents on a laptop.

Student 2: “I did it for the project module, the gluten intolerance and Celiac disease one. So in one page it summarized our 25-30 page study guide document all right there with one table and just a couple paragraphs, and it was awesome. And I’ve done that with a couple of them. I’ll see this handout and I’ll think, ‘oh, that looks cool’, and it is amazing. So if we incorporated those handouts in some way.”

Student 5: “I was going to say incorporating them into the nutrition facts portion.”

Student 2: “Yeah, in the nutrition facts would be a great thing.”

Student 5: “Because [the course instructor] can specifically use that sheet while we are presenting the nutrition facts, and then incorporate [student 4’s] idea with [the course instructor] basically prompting us with the sheet.”

Student 4: “Then we have to present our recipes at the same time rather than just picking out a random one.”

Student 1: “I would like that.”

Student researcher: “And so that patient handout typically would pertain to the case study as well, I’m assuming?”

Student 5: “Yes.”

Student 2: “Yes, in some way it would have to.”

Student 1: “If it is under the module it would, because you click on the module and it is under there.”

Student 2: “It had to pertain to the module if not the specific case study, it would be the module topic.”

Student researcher: “Awesome, I think that would make sense to incorporate in to the nutrition review, definitely. I will definitely get that in there and pass all of that on… Anything else?”

Student 4 left the room.

Student 1: “No, it has been great.”
Student researcher: “It has, it has been a lot of fun. I think overall it went really well. I think it was great. Obviously changes can be made because this was the first time it ever happened, but overall, I think it was outstanding.”

Student 5: “And I would say the level of rigor was perfect. I didn’t feel swamped this summer with everything else that we have going on, that was very important. I would have been massively upset if it was like, you have to memorize 50 things…”

Student 1 and Student 3 verbally agreed.

Student researcher: “Well yes, this is your only summer. But you also felt like it was beneficial.”

Student 5: “Right, it felt like it was just enough to where I am leaving the summer with new knowledge, and not only for myself, but for family members, friends, patients, you name it. So it was not so non-rigorous that I don’t know anything and I just spent time doing this.”

Student 1: “It was never a waste of time.”

Student 5: “Right.”

Student 2: “Yeah, I am interested to see how the culinary medicine class goes during our M2 year, and if it goes crazy, to then switch the summers of two days a week to summers of three days a week. Like a Monday, Wednesday, Friday.”

All other students verbally agreed with student 2

Student 3: “Or a Tuesday, Wednesday, Thursday.”

Student 1: “Yes, I would be okay with that so you still have your weekends and you can travel.”

Student 2: “So that, once again, if we go through M2 and its fine with culinary medicine, then great, we had this wonderful summer and it’s both rigorous and relaxing and not that bad. But if M2 gets kind of crazy, it might be beneficial then to get some of those modules in the summer.”

Student researcher: “That’s a good point.”

Student 1: “I’m hoping it works out. It sounds like it will match with the modules too.”
Student 2: “I hope so too.”

Research advisor: “It will be a Tuesday afternoon, the next set?”

Student 5: “Once a month, Tuesday afternoon, 1:00-5:00 PM.”

Student 3: “They said it is going to be coinciding with what we are going to be learning in school anyway.”

Student 1: “And not right before exams too.”

Student 5: “Right.”

Student 3: “So it might be helpful.”

Student researcher: “I am sure they will look at that, and it could all fit into the summer if it had too.”

Student 2: “And like I said, I hope it doesn’t end up the case because I really did like the rigor.”

Student researcher: “Okay, well thank you guys so much for all of your feedback and for coming on your [day] off.”

Research advisor: “You all did such a good job sharing. This helps us all.”
Appendix D

Culinary Medicine Curriculum Delivery Participant Feedback Questionnaire

*C1 indicates strongly disagree, 5 indicates strongly agree*

1. There was enough time allotted to each module.
   1   2   3   4   5

2. The sequence of module presentation was organized and clearly explained.
   1   2   3   4   5

3. The course location was convenient in relation to your commute.
   1   2   3   4   5

4. All members of this course worked well together.
   1   2   3   4   5

5. The time put into this course was beneficial to my career.
   1   2   3   4   5

6. I would recommend this course to a fellow peer.
   1   2   3   4   5

7. This course provided a greater understanding of culinary medicine.
   1   2   3   4   5

8. This course positively influenced my personal dietary habits.
   1   2   3   4   5

9. I am pleased with the overall quality of this course.
   1   2   3   4   5

10. I am pleased with the overall content of this course.
    1   2   3   4   5