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A Regional Campus Approach to Culinary Medicine for Inter-professional Students

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Introduction

Many chronic health conditions including obesity, diabetes, hypertension, and cancer can be prevented or reduced through proper nutrition.¹⁻³ In the last decade, an acknowledgement that many medical professionals lack a practical understanding of nutrition, eating behaviors, and culinary skills has resulted in a movement to include culinary medicine curricula in healthcare education programs.⁴ Culinary medicine is the integration of the art of food preparation, specifically cooking, with the science of medicine.⁵ Culinary medicine teaches healthcare professionals and students to recognize the holistic benefits of food and how diet can aid in the treatment and prevention of specific health conditions. Tulane University was one of the first U.S. medical schools to integrate culinary medicine into their medical curriculum. In 2013, Tulane opened the Goldring© Center for Culinary Medicine, which now licenses its culinary medicine curriculum, "Health meets Food," to more than 50 medical schools in the U.S.⁵⁻⁶

Established in 2007, the University of Arkansas for Medical Sciences (UAMS) Northwest Regional Campus trains third and fourth year medical and pharmacy students, doctor of physical therapy students, graduate level nursing and genetic counseling students, and undergraduate level radiological imaging students.⁷ The UAMS Northwest Regional Campus trains approximately 300 students on campus each year.

More than 200 miles separate UAMS Main Campus (Little Rock) and the UAMS Northwest Regional Campus (Fayetteville). The UAMS Northwest Regional Campus has built research and community-based programs focused on healthy food consumption and the prevention and treatment of chronic conditions, especially diabetes.⁸⁻¹³ In addition, the campus has a strong inter-professional education (IPE) program,¹⁴ where students from all professions work and "learn about, from, and with each other to enable effective collaboration and improve health outcomes".¹⁵ Students on both campuses complete the IPE curriculum based on the 3 goals of the triple aim approach to healthcare: improving the patient care experience, improving the health of those we serve, and discovering how to reduce the cost of care. In 2018, the UAMS Northwest Regional Campus began a process to expand its IPE program to include culinary medicine and wanted to do so in a unique inter-professional way while working within the financial constraints of a regional campus. To our knowledge, UAMS Northwest Regional Campus is the first regional medical campus to implement a culinary medicine curriculum with IPE requirements, and to implement the Goldring© curriculum. Implementing an IPE culinary medicine program on a regional campus may create financial challenges that prohibit or limit the learning experience. The model demonstrated by the UAMS Northwest Campus reflects the advantages of

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partnering with local organizations to overcome financial and operational barriers to implementing a culinary medicine program. This article describes the implementation process and preliminary results of an inter-professional culinary medicine pilot program on a regional medical campus.

Regional Campus and Cross-Institutional Approach

To implement a culinary medicine program, UAMS Northwest Regional Campus partnered with Northwest Arkansas Community College's program, Brightwater: A Center for the Study of Food. Brightwater offers academic and career training in the areas of culinary nutrition, artisanal food, beverage management, and food entrepreneurship. Northwest Arkansas Community College is the first community college and first nursing program to utilize the "Health Meets Food" curriculum licensed by the Goldring® Center. The partnership with Brightwater provides students and faculty on the UAMS Northwest Regional Campus with access to a fully operational teaching kitchen, dietitians, and culinary professionals during IPE student events. The Vice Chancellor of the UAMS Northwest Campus facilitated a meeting in early 2018 between the leadership of UAMS Northwest Regional Campus and Brightwater to discuss potential partnership opportunities in culinary medicine. Participants in this meeting identified opportunities for collaboration, with a primary goal of inter-professional education for students on the Northwest campus in the area of culinary medicine. The goal included the development of a series of student events that incorporate both the Goldring® culinary medicine curriculum and the UAMS IPE triple aim curriculum¹⁴ framework throughout an immersive culinary experience.

In this article, we will discuss the development of an IPE student program detailing the implementation process and preliminary feedback from students.

Implementing Culinary Medicine IPE for Regional Campus Students

To better understand the "Health meets Food" curriculum,¹⁶⁻¹⁷ faculty from the UAMS Northwest Regional Campus attended a culinary medicine demonstration at Brightwater. IPE leadership and faculty members from multiple academic programs (e.g. Medicine, Pharmacy, and Physical Therapy) participated in an active learning discussion and immersive cooking experience focused on food allergies and intolerances. Following this experience, UAMS faculty worked with Brightwater to make minor changes to the program so that it would meet the IPE competency requirement of application of the knowledge by an inter-professional team. Other changes included incorporating simple recipes with basic culinary skill requirements to accommodate the level of students' culinary knowledge and basic cooking skills. The training also required inter-professional students to apply didactic knowledge to patient case scenarios. From October

2018 to February 2020, three groups of UAMS Regional Campus students (see Table 1) participated in an IPE culinary medicine workshop at Brightwater.

Didactic

The "Health Meets Food" module selected was the introduction to culinary medicine that included Mediterranean diet principles and the use of mindfulness when preparing and consuming meals. The didactic portion included a flipped classroom approach to case study and review. The flipped classroom design focuses on application of didactic material during the face to face session by providing guided readings, online lectures, or study guides prior to the learning experience.¹⁸ Students received readings and study guides by email during the week prior to the culinary program to allow them to prepare for the face-to-face session. Brightwater and UAMS Northwest Regional Campus faculty facilitated inter-professional discussion of the readings and case study with the student participants prior to the hands-on culinary training.

Students were divided into small (2-4 students) inter-professional groups to discuss readings and complete questions about the case study. Students were engaged in the discussion but expressed hesitancy to answer nutrition and dietary questions because of their inexperience with nutrition and culinary topics.

Table 1. Demographic Data

Characteristic	Number (Percentage)
Health Professions Program	
Medicine (MD)	7 (21.21)
Pharmacy (PharmD)	9 (27.27)
Physical Therapy (DPT)	9 (27.27)
Nursing (APN)	2 (6.06)
Radiology Imaging	5 (15.15)
Genetic Counseling	1 (3.03)
Age Category	
Ages 20-24	15 (45.45)
Ages 25-29	16 (48.48)
Ages 30-34	1 (3.03)
Ages 35-39+	1 (3.03)
Race/Ethnicity	
Non-Hispanic Black	0 (0)
Non-Hispanic White	26 (78.78)
Hispanic/Latino	3 (9.09)
Asian	3 (9.09)
Native American	1 (3.03)
Gender	
Female	20 (60.60)
Male	13 (39.39)

Culinary Immersion Training

Immediately following discussion of the didactic material, students moved from a classroom to a teaching kitchen on the Brightwater campus to begin the culinary immersion training. The culinary immersion training focused on how simple modifications to a recipe can improve nutritional value. Each student group was assigned a cooking station prepared with a recipe, cutting board, knives, and the required ingredients. For the first student program the recipe focused on preparing Spaghetti Bolognese. For the 2 other student programs, the recipe was for tacos. This change in recipe was due to choosing a simpler recipe for students to complete during the learning experience. Both focused on learning simple recipe modifications to improve the nutritional content for each dish.

A Brightwater chef began the session with an introduction to basic knife and cooking skills. Recipe modifications were discussed in all programs. The Spaghetti Bolognese recipe program had one student group, consisting of a practicing vegan and a vegetarian, who both raised concerns over vegan options for their recipe. Working quickly to exchange the pasta with a vegan spinach pasta, the Brightwater staff demonstrated both the ease in which recipes can be adapted to individual needs but also the need to be flexible when cooking. In all events, students discussed the impact that a simple change could have on the overall nutrition and accessibility of healthy foods for their patients.

During the culinary medicine program, students experienced many foods for the first time or utilized familiar foods in a new way. Recipes modifications came from the "Health Meets Food" curriculum. Each group of students prepared a variation of Spaghetti Bolognese or tacos that included substitutions and additions that could easily be communicated to patients. For the Spaghetti Bolognese, one recipe consisted of a traditional meat sauce that substituted ground beef with ground turkey and plain pasta with whole grain pasta, simple and inexpensive substitutions with increased fiber and vitamin content. Another recipe called for the addition of vegetables to the meat sauce. Carrots and peppers added to the sauce decreased the amount of meat needed and increased vitamins and fiber. The third group eliminated meat completely and replaced it with lentils. Lentils, the students agreed, would be an easier transition into a meatless meal for patients hesitant to try tofu or other meat alternatives. The final recipe, including the last-minute substitutions, was a vegan recipe with green spinach noodles and meatless tempeh crumbles. High in nutrients, fiber, and protein, the vegan Spaghetti Bolognese was a favorite of the group for taste and texture. The students recognized that without the experience of cooking and sampling these ingredients it would be difficult to recommend a vegan option to patients accustomed to meat and potato meals. Throughout the cooking demonstration students mentioned repeatedly how cooking was a mindful experience that left little time for them to think about finals or clinical rotations.

During the event where the taco recipe was utilized, the first recipe was a traditional, beef taco high in sodium and saturated fat served with a flour tortilla. The second recipe was a combination of meat and vegetables. It reduced the meat by half, added vegetables to the taco filling, used salt-free seasonings, and substituted the flour tortilla with a corn tortilla. The third recipe was a combination of meat and beans. It also reduced the beef by half, added beans to the taco filling, utilized salt-free seasoning, and was served with a corn tortilla. The final recipe was a bean and vegetable combination using salt-free seasoning and was served with a corn tortilla. All tacos were served with traditional toppings such as cheese, lettuce, and tomatoes. Additional spices varied for each recipe. As with the spaghetti recipes, the chef presented all 4 variations to the class as a whole to compare and contrast how specific modifications influenced nutritional value, preparation effort, and appearance.

In all 3 programs, students sampled each recipe variation of the prepared dish to compare and contrast the impact of recipe modification on taste and pleasure. The students plated on varying sized and shaped plates, prompting a discussion about the impact these differences could have on caloric intake, potentially weight loss, the management of chronic diseases such as diabetes and hypertension, and overall health. The purpose was to help students witness firsthand how a popular household dish can be modified to be more nutritious yet remain delicious to a wide variety of patients. Additionally, students were able to see how modifications can be accomplished progressively to acclimate to healthier eating. This flexibility in food preparation provides opportunity to empower patients in creating their own dishes through small or large modifications to impact their health.

Roles and Responsibilities

The integration of the "Health Meets Food" curriculum into the UAMS IPE framework required a close collaboration between UAMS faculty and Brightwater staff. Table 2 outlines the roles, credentials, and responsibilities of key faculty and staff members.

Table 2. Roles and Responsibilities

Role	Program	Titles/Credentials	Responsibilities
IPE Director	UAMS	Faculty member	Curriculum development: development of culinary medicine component for competency workshop in compliance with approved UAMS IPE frameworks, secure approval for culinary medicine module through UAMS IPE office, work with Brightwater staff to define roles of faculty/staff within approved IPE curriculum model
Medical Professional Facilitator (2)	UAMS	Clinical Faculty Member	Classroom: facilitate discussion of medical and IPE topics during experience. Debrief: facilitate discussion relating kitchen experience to the classroom material and medical and IPE training, IPE: Facilitate and moderate inter-professional conversation between student peers
Culinary Professional Facilitator	Brightwater	Registered Dietitian	Curriculum implementation, classroom instructor: facilitate face to face classroom experience, review of case studies, study guides Recipe Development in compliance with Goldring Curriculum Kitchen Demonstration: Food preparation support, facilitate nutrition, and dietary discussion Debrief: facilitate discussion relating kitchen experience to the classroom material
Lead Chef	Brightwater	Chef/Instructor	Recipe development Kitchen demonstration: safety skills, basic cooking skills, food preparation support

Methods and Results

Students volunteered for the opportunity to complete the IPE pilot project culinary medicine event, with the exception of the medical students who were assigned the experience by their department. All students received full disclosure the event would count for IPE required credit. Immediately following the learning experience, students completed a learner survey which consisted of 3 quantitative questions with responses on a 5-point Likert scale and 3 open-ended qualitative questions. The qualitative questions were designed with a case study strategy of inquiry and participants were given an unlimited response box for written answers. The learner survey was developed by the primary investigator.

The majority of the students provided positive feedback about the learning experience (Table 3). Students reported strongly agree (81.81%) or agree (15.15%) that the experience was “valuable in my growth as a healthcare professional”. In determining if the students found the learning experience helpful in learning the role of other disciplines during the event, 54% of students rated as “strongly agree” with 30% of students rated as “agree”. The value of the information in patient care for each student’s discipline was rated 72% “strongly agree” and 15% “agree”. The open-ended survey question responses were analyzed via hand-coding the qualitative data by the primary investigator. The primary investigator analyzed text segments to determine coding for 3 quantitative questions. Coding revealed 3 general themes: 1) the novelty of the information learned, 2) the relevance of the information for patient care, and 3) the value of teamwork. These 3 emerging themes were found in the majority of student responses, regardless of healthcare discipline. During the learning experience, students developed strategies to educate patients in simple food choices and/or food exchanges to promote overall patient wellness.

Examples of student responses based on the theme of information novelty included:

- *“Today I learned that making healthy substitutions for meals is easy and delicious.”*
- *“I learned that many of us have the same problems of food or diet recommendations for our patients.”*

Examples of student responses based on the theme of relevance of the information included:

- *“I think by being more knowledgeable about healthy food choices/recipes, I will be able to help my patients make better food choices.”*
- *“I learned a lot about how to increase the nutritional content of simple meals which will help me when talking about nutrition with future patients. I think it will be much more beneficial to the patient to be able to give concrete, easy examples or changes they can make.”*
- *“I enjoyed the interactive aspect of this and getting to learn some tangible ways I can encourage my patients to improve their diet!”*

Examples of student responses based on the theme of teamwork included:

- *“There are things that each of us are better at and we can teach each other”*
- *“It was a valuable experience because we had to work together to complete a task. It would have been hard for me to complete on my own.”*
- *“I learned how to work better with a partner. Delegation skills on who is going to do what, as well as effective communication are important so we knew that we did not miss any steps in the recipe.”*

Table 3. Student responses to Learner Survey

Question		Number (% of Survey Respondents)
<i>This learning experience was valuable in my growth as a healthcare professional:</i>		
	Strongly disagree	0
	Disagree	0
	Neutral	1 (3.03)
	Agree	5 (15.15)
	Strongly agree	27 (81.81)
<i>This learning experience was valuable in learning about other healthcare disciplines and their roles in patient care/management:</i>		
	Strongly disagree	0
	Disagree	2 (6.06)
	Neutral	3 (9.09)
	Agree	10 (30.30)
	Strongly agree	18 (54.54)
<i>I will use the information learned today in working with patients in my profession:</i>		
	Strongly disagree	0
	Disagree	0
	Neutral	4 (12.12)
	Agree	5 (15.15)
	Strongly agree	24 (72.72)

Discussion

Learning through immersive, interactive experiences, beyond side-by-side content mastery, is core to the success of inter-professional education. Constructivism is the learning theory which embraces the idea that knowledge is constructed not only through contextual learning, but also through the experiences of the learner and interaction with other learners.¹⁸ The learning experience described fits the constructivism theory and includes the inter-professional dynamic within the immersive experience. This type of learning promotes both understanding and appreciation for health professions beyond the students' chosen profession and catalyzes the skills necessary to successfully work within inter-professional healthcare teams.¹⁹

Students recognized the culinary medicine training as new and different from their respective didactic curriculums, but also recognized the value in the knowledge obtained. The importance of teamwork in patient care was highlighted by the student responses as teamwork was stressed during the culinary activities of completing the recipe. After utilizing the culinary medicine information to discuss patient scenarios, students identified the information as being useful across the boundaries of each healthcare discipline.

The culinary medicine program on a regional campus was strengthened through collaboration with the community partner. Brightwater provided the students with a professional kitchen and the lessons in culinary skills not readily available on the regional medical campus. This partnership created a unique educational environment for both experiential learning with inter-professional learners. The contextual learning prior to the experiential component promoted the application of knowledge. The experiential learning removed any barriers between students and allowed for meaningful discussions at the conclusion of the event. During the educational debrief, students discussed the importance for healthcare professionals at all levels of patient

care to openly communicate both with the patient and with members of other healthcare professions about the nutrition and dietary health of their patients. Students discussed the general interventions and measures each of the represented health professions could take with patients and how health professionals could coordinate nutritional interventions for patients through inter-professional teams, referrals, and communication to accomplish a task.

Conclusion

Sixty percent of American adults live with at least one chronic health condition, and many of those conditions can be prevented or treated with proper nutrition.²⁰⁻²¹ Therefore, it is imperative that healthcare professionals address nutrition and dietary recommendations with their patients. Student learning programs as described provide an important teambuilding opportunity to train the next generation of health care professionals in the knowledge of culinary medicine. The program's combination of didactic and culinary immersion training in inter-professional teams was found to be a valuable experience by the students. Implementation of a culinary medicine experience on a regional campus should not be limited due to lack of on-campus resources. Collaborations with community partners can provide rich and meaningful learning opportunities for students. This article provides an example of how a regional campus can partner with local organizations to implement an innovative culinary medicine program that meets students' IPE requirements.

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