Culinary Medicine

Subjects: Food Science & Technology
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Culinary medicine is an emerging discipline in clinical and public-health education that provides healthcare professionals and community members with food-based knowledge and skills. With the hands-on teaching of kitchen education to individuals, culinary medicine provides eaters with tangible strategies for reducing sodium through home cooking.

Keywords: Culinary Medicine ; Sodium ; food-literacy

1. Introduction

Culinary medicine is an emerging concept in clinical and public-health education that provides healthcare professionals and community members with food-based knowledge and skills [1][2]. Culinary medicine is not defined or endorsed by a single dietary philosophy, and it may vary depending on a patient's disease-specific dietary needs. However, curricula unquestionably focus on whole-food nutrition, while fostering knowledge among medical professionals about healthy dietary practices and counseling patients in need of dietary intervention about how to shift a majority of meals to being home-based. Several previous studies demonstrated that culinary-medicine interventions improved dietary-counseling competency for sodium reduction among medical students, residents, physicians, and nurses [3][4][5]. Furthermore, such interventions also led to increased adherence to Mediterranean diet practices among community members and healthcare professionals themselves. For example, compared to community members randomized to traditional nutrition counseling, those randomized to a 6 week hands-on teaching-kitchen education class reported a 1.5–2-fold higher consumption of vegetables and preparation of home-cooked meals [6], both of which are associated with an exceedingly lower quantity of sodium intake. Such initial data demonstrated a utility of teaching-kitchen education for sodium reduction, and suggest that the addition of culinary-medicine training should become a priority in medical schools and hospitals across the United States.

The largest culinary-medicine programming platform in the U.S., the Health meets Food curriculum, has focused on translating Mediterranean diet nutrition principles for the American kitchen. Previous studies demonstrated that higher Mediterranean diet adherence is associated with a reduction in sodium intake and downstream ASCVD, including hypertension [7][8][9]. Health meets Food courseware has improved Mediterranean diet adherence across a wide variety of groups, including community members and their children, medical students, and physicians [3][4][5][6]. The curriculum teaches individuals to cook meals using recipes that target less than 500 mg of sodium per serving, which equates to a maximum of 1500 mg/day, leaving room to meet sodium guidelines with the addition of up to two snacks per day. For example, one of the first modules taught to medical students involves cooking a variety of spaghetti dishes that include different tomato sauces containing beef versus those containing higher ratios of vegetables and legumes. In addition to showing that the plant-based legume dish has less saturated fat compared to the dish with beef, cooking tomato sauce from scratch and/or choosing a tomato sauce that is low in sodium can drastically reduce mealtime salt intake while preserving flavor. Overall, teaching individuals the principles of a Mediterranean diet can reduce sodium intake through the consumption of a higher quantity of whole foods, vegetables, and plant proteins (tofu, beans, and legumes) that are traditionally prepared with lower sodium density compared to animal-based proteins [10][11]. Furthermore, the higher amount of potassium found in plant-forward dietary patterns, including the Mediterranean diet and Dietary Approaches to Stop Hypertension (DASH), can help preserve normotension and a low ASCVD risk, even in the setting of high–normal sodium intake [12][13].

Sodium

Sodium is a primary and ubiquitous constituent of our food supply, such that even determined individuals find it challenging to reduce their salt consumption. Excess sodium has a major role in the etiology and pathogenesis of hypertension [12], but also broader atherosclerotic cardiovascular disease (ASCVD) [14], directly contributing to increased arterial stiffness and adverse ventricular remodeling [15][16]. Overall, ASCVD continues to be the leading global cause of morbidity and mortality, as hypertension, coronary heart disease, stroke, and congestive heart failure affect 48% of the

U.S. population, or approximately 121.5 million Americans [17]. Sodium-reduction initiatives in the United States date back to 1973 and 1979, when the American Heart Association and the American Medical Association advised citizens to aim for lower salt intake [18]. Over the course of nearly 50 years, medical and public-health professionals have aimed to reduce both individual- and population-level sodium consumption by enhancing consumer knowledge and food labeling, and to reform food policy. While all of these approaches improved awareness, Americans continue to consume nearly 1.5- to 2-fold higher-than-recommended daily intakes of sodium [19][20]. These observations demonstrate that our paradigm towards achieving dietary sodium recommendations may be incomplete, and suggest that more experiential nutrition-education techniques are required to help overcome an epidemic of sodium excess and improve primary ASCVD prevention.

2. Food Literacy

One of the primary goals of kitchen-based education is to improve food literacy. Food literacy describes a broad set of skills that are required to participate in healthy and responsible food- consumption behavior [21]. This means both possessing knowledge about healthy diet habits and incorporating knowledge into practice [21]. Food literacy in the setting of sodium reduction consists of knowing about the deleterious effects of sodium on health, understanding how to determine sodium content in foods, and practicing sodium-conscious dietary habits through such concepts as flavor balancing. Overall, food literacy is a promising avenue in the promotion of healthy dietary practices [22]. Several previous food-literacy scales have been proposed and created; however, no universal scales remain in place for measuring food literacy in communities [23]. Such scales were developed across several different demographic populations and included an overall similar category of knowledge domains (Table 1). To date, the Chinese Health Literacy Scale for Low Salt Consumption included the most domains related to sodium consumption and knowledge [24]. Although no standardized scale has been implemented, questions to assess the food literacy of class participants are incorporated within pre- and post-class Health meets Food surveys (medical trainees, medical professionals, and communities) that address attitudes, beliefs, and behaviors. Additionally, quizzes are given to medical trainees and professionals after the pre-class portion of the modules to determine the uptake of food-literacy concepts and knowledge.

Table 1. Common food-literacy domains.

Ability to understand text
Nutrition and health
Energy sources in foods
Household food measurement
Food label and numeracy
Food groups
Consumer skills
Engagement in dietary habits
Taking a critical stance towards nutrition claims and their sources
Calculating and converting sizes
Influence of endorsement logos
Knowledge of salt content
Knowledge of diseases related to high salt intake
Knowledge of international standards
Myths about salt intake
Attitudes towards salt intake
Sodium food-consumption practices

Approximately one-quarter of all people in the United States do not have adequate food literacy [25]. Thus, a substantial proportion of Americans have problems interpreting nutrition labels and understanding how dietary behaviors affect chronic-disease development, which are large barriers to ASCVD prevention efforts. Individuals with higher food literacy and dietary-sodium awareness have lower sodium intake [26][27]. In patients with heart failure, those who have higher levels of food literacy have lower sodium consumption, improved control of their disease, and higher quality of life [28]. Knowledge about sodium and its health effects has a significant association with dietary practices and sodium consumption. Awareness of proper sodium-consumption regimens and knowledge of food-sodium content decrease sodium consumption [27]. Promoting food literacy with a warning label about sodium content in a food leads to decreased sodium consumption [20]. Improving food literacy through nutrition education improves knowledge about sodium intake and modifies consumption behavior. Teaching people how to read nutrition labels and identify food sodium content promotes improved self-regulation of sodium consumption [29][30].

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