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Preventing Cardiovascular Diseases: The Need for Nutrition Education among Physicians

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Abstract: **The lack of nutrition education for physicians and medical students is a topic of interest that could potentially help decrease the rates of cardiovascular disease in the United States and around the world. The inadequacy of nutritional information provided to patients by doctors has been closely linked to risks for cardiovascular diseases. This literature review paper will present the current research reflecting the demand for nutritional training among physicians in the United States while highlighting the lack of interest among doctors in countries such as Saudi Arabia. The efforts of the Academy of Nutrition and Dietetics promoting nutrition advocacy in medical settings has been found to be critical in combining the efforts of nutritionists and doctors to work together in medical settings. The Coaching On Achieving Cardiovascular Health (COACH) is also discussed as an important tool for lifestyle recommendations combined with important medical information to improve patient health. In essence, the research shows that there is a need for doctors to act as storytellers encouraging patients to think holistically about health, which includes diet recommendations to patients. Furthermore, greater efforts to implement nutrition training among medical doctors in countries where nutrition is often overlooked must be considered in order to reduce the rates of cardiovascular disease.**

Keywords: **Nutrition education deficiency, cardiovascular diseases, nutritionally trained doctors, registered dietitian nutritionist, COACH program, evidence-based health food and supplements, nutrition intervention, community health teams.**

I. INTRODUCTION

Westernization and globalization have increased the consumption of junk food causing increased rates in cardiovascular diseases. According to a 2013 study, "Globally, death rates from cardiovascular disease are increasing, rising 41% between 1990 and 2013, and are often attributed, at least in part, to poor diet quality." (Aggarwal, 2018). In order to prevent cardiovascular diseases, eating healthy is key, however, the current data revealed that knowledge of nutrition among cardiovascular disease providers worldwide is largely lacking. There is also evidence that the less a doctor spends time counseling their patients the more an individual is likely to get some form of cardiovascular disease. As nutrition is directly related to health outcomes, increased efforts to train doctors are pertinent. In one survey administered to cardiologists in America and Europe, over 70% of doctors believed that it is their duty to incorporate thoughtful nutrition advising into their practice." (Aggarwal, 2018). This review of the literature will highlight the deficiency of nutritional education among doctors and medical students.

II. BACKGROUND

Many cardiologists believe that a healthy diet is an important aspect of cardiovascular guidelines for risk reduction and treatment. Unfortunately, many cardiologists, cardiology fellows-in-training, and cardiovascular team members do not have the proper nutrition education to implement these guidelines. One study administered 930 surveys to doctors and it was found that, "Among cardiologists, 90% reported receiving no or minimal nutrition education during fellowship training, 59% reported no nutrition education during internal medicine training, and 31% reported receiving no nutrition education in medical school. Among cardiologists, 8% described themselves as having "expert" nutrition knowledge." (Devries, 2017). Most cardiologists say that most of them did not receive or had minimal nutrition education during their training sessions. Some say that they have not received any nutritional knowledge at all in medical school. Large portions

of cardiovascular specialists have not received nutrition education and continue to experience a gap in knowledge. The U.S. Burden of Disease Collaboratory has identified poor diet as an exceptional risk factor stating that, "Among the top 17 risk factors, poor diet quality has been identified by the US Burden of Disease Collaborators as the leading cause of premature deaths and disability in the United States." (Devries, 2017). Cardiologists report that they do not frequently discuss nutrition during appointments and do not give much advice to their patients. Besides a lack of nutrition education, self-assessed knowledge, counseling skills, and low personal adherence to a heart healthy diet pattern has been found.

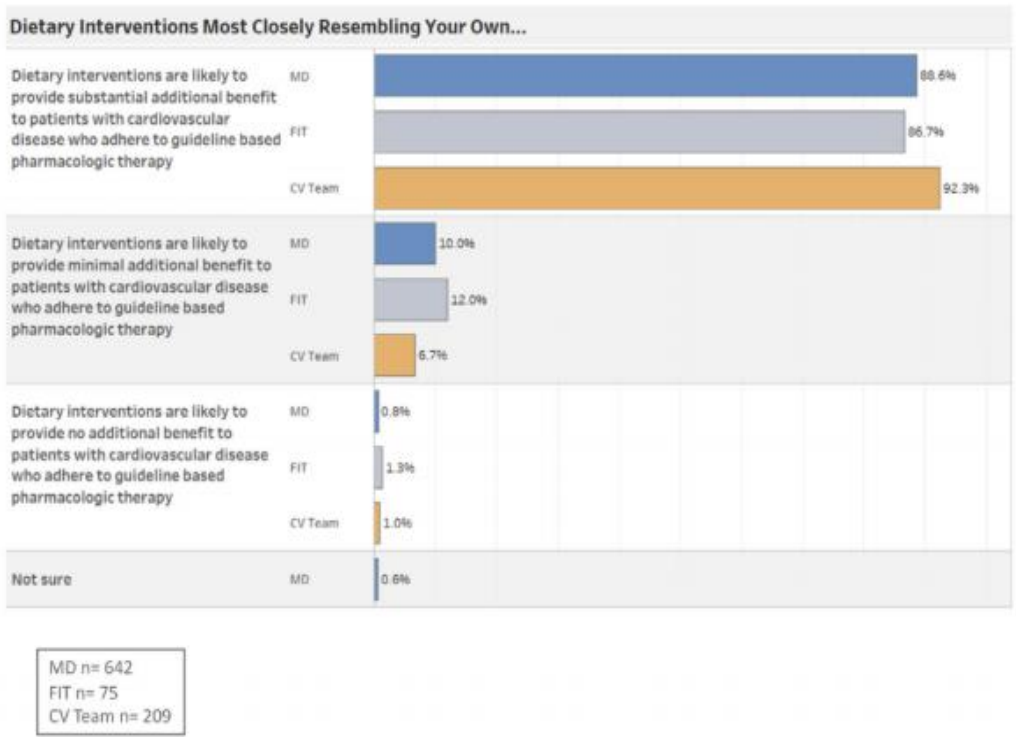

Figure 1: Opinions of cardiologists regarding nutrition intervention.

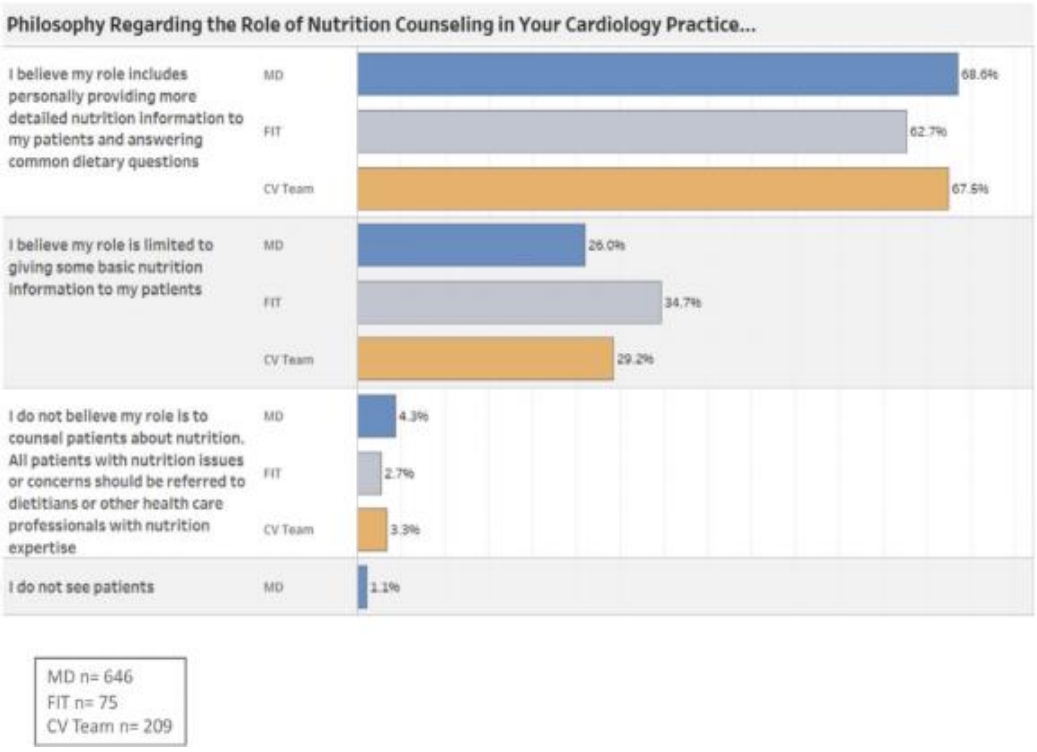

Figure 2: Perceived responsibility for cardiologists providing nutritional information.

Regarding the exact time spent discussing nutrition with patients during an appointment, a majority of doctors did discuss diet but minimally. Surprisingly, a mere 4% of cardiologists did not mention nutrition while 18% of doctors spent less than a minute and 40% spent 2 to 3 minutes explaining nutrition benefits to a patient. Those who spent 5 minutes was at 25% and time spent over 5 minutes decreased to 8% for a 10-minute visit and 4% for a 15-minute visit. Fellows-in-training were found to have similar results when compared to cardiologists.

III. THE DEMAND FOR NUTRITION EDUCATION

A. The Need for of Nutrition Education in Medical Training

In a thirty-four page accreditation document for cardiology training, there are zero pages dedicated to nutrition counseling. According to a recent survey, "Medical schools revealed an average of fewer than 20 hours over 4 years devoted to nutrition education —most of which occurs in the early years when basic science courses are taught, typically with little apparent connection to human diets or common diseases." (Devries, 2014). Medical schools must reconsider their training module to incorporate diet as part of a cardiologists' training program. It goes to show that the Survey of American Dietetic Association revealed that only 61% of doctors are credible and reliable sources of nutrition information. One cardiologist from the American Dietetic Association stated, "The annual cost of cardiovascular disease in the United States was recently estimated at $315 billion. Imagine the savings if, as the data suggest, we could reduce the risk of vascular events by at least one third with widespread adoption of proven nutritional strategies." (Devries, 2014). A holistic understanding of medicine, one that includes diet, may prove beneficial not only for decreasing the rate of disease but minimizing costs.

One study performed by researchers tested medical students' satisfaction with their knowledge of nutrition education through a questionnaire. The results revealed that the majority of the students (70%) were dissatisfied with the amount of time dedicated to nutrition education in their curriculum. A mere 22.2% felt adequately prepared by their current nutrition education to provide nutrition care in the general practice setting. Satisfaction with current education in nutrition was positively related to students' preparedness to provide nutrition care in a medical practice setting. Students regarded nutrition to be relevant to their future practice, but also felt unsatisfied and disappointed with the quality and quantity of their current nutrition education. This is not only the case for medical students but also doctors (particularly in cardiology) who have expressed dissatisfaction with their education regarding nutritional education, and thus feeling lost when posed with nutritional questions from patients.

B. Trained Doctors are Unqualified to Speak on Nutrition

Patients often trust doctors as important and credible sources of information on health and nutrition. Doctors are in a position where they have the power and influence to encourage healthier lifestyles consisting of a balanced diet with plenty of exercise. To many patients, it may seem that doctors overlook and sometimes completely ignore talking about nutrition with them. The current research shows that the doctors do not feel qualified to discuss nutrition due to a lack of training. In one experimental study implementing nutritional training for doctors, Koushik R. Reddy, Andrew M. Freeman, and Caldwell B. Esselstyn realized nutrition is not given the attention it should be. Koushik Reddy, who is a cardiologist, said that he had to rely on nutritionists, reading several books to learn more about this important topic. Andrew Freeman, another doctor who underwent nutrition training, noted the astounding results that the reduced intake of junk food and soda had on his patients. He has come to believe that medical schools are doing a great disservice to doctors-in-training by not discussing food and nutrition in their curriculums. Freeman was disappointed stating, "In fact, in a recent survey of about 1000 cardiologists, nearly 90% had little to no knowledge or education in day-to-day nutrition." (Reddy, 2018).

On a more international scale, May Al-Muammar, a doctor in Riyadh City, explains how the influential and multi-faceted role of physicians is a growing interest in Saudi Arabia; however, nutrition education still remains largely obscure. To bring solutions to the rising issue in Saudi Arabia, Al-Muammar conducted a study to investigate physicians' practices concerning nutrition education and how they do with their patients. A mere 7.9% of practitioners say that they are practicing all aspects of nutrition education that include nutritional assessment, therapy, and education, and 80% of Saudi Arabian doctors say that they have poor nutritional knowledge. (Reddy, 2018).

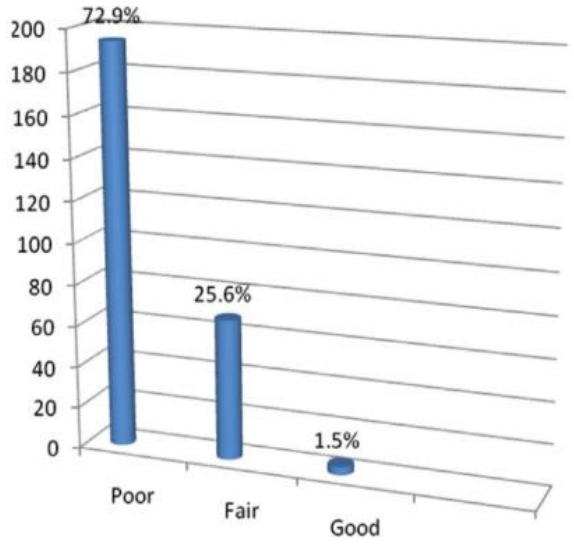

Figure 3: Percentage of physicians' knowledge levels regarding nutrition.

Unfortunately, many Saudi Arabian physicians do not see a need for providing nutritional information to patients. Al-Muammar expresses concern saying, "Nutritional practice in hospitals has low priority. Previous surveys have shown that there is a disparity between physicians' beliefs about the importance of diet and nutrition in health maintenance and disease prevention and the actual delivery of nutrition counseling." (Al-Muammar, 2011). The ramifications from such lack of counseling is beginning to take place since obesity and heart problems are becoming a growing concern in Saudi Arabia. Similar to the medical trends in America, Saudi Arabian medical schools and hospitals do not prepare doctors-in-training in matters regarding nutrition. The statistics reveal that only 22.2% of physicians have dealt with weight management issues, 19.2% attended free nutrition conferences, and only 1.5% have self-assessed themselves as knowledgeable in nutritional skills and knowledge. Al-Muammar believes one of the most effective solutions for obesity and heart disease in Saudi Arabia is to increase knowledge of nutrition in medical schools, enhance physician training, and increased research efforts regarding diet and exercise should be made.

C. The Need for Registered Dietitian Nutritionists

Sonja L. Connor, the former president of the Academy of Nutrition and Dietetics, addressed the longstanding issues of nutrition. Physicians need to stay up to date on nutrition, but the reality is that they do not have the expertise to provide patients with the depth and breadth of medical nutrition therapy to the extent that a Registered Dietitian Nutritionist (RDN) can. Therefore, Connor believes that physicians should include registered dietitian nutritionists in their medical teams to act as a credible source regarding nutrition. Connor states, "If all health professionals practice to the top of our competencies, patients will benefit through consultations with the most highly educated and experienced professionals in the area of food and nutrition: registered dietitian nutritionists" (Connor, 2015). Members of the Academy of Nutrition and Dietetics agree and encourage that nutritionists should be able to see a physician's patient. The American Association of Medical Colleges have also noted the tracking of nutrition and dietetics are not well addressed and are oftentimes misinformed. This is because the doctors are not formally trained in dietetics compared to an RDN, and it shows when trying to provide nutritional information to patients. Connor further claims that referring to an RDN, "Could be one of the most important ways that healthcare professionals help patients learn about, implement and sustain behavior changes" (Connor, 2015) However, Connor herself and many RDNs will still argue that physicians must gain nutritional knowledge in the hopes of the physician and RDN working together congruently.

IV. SOLUTIONS FOR LACK OF NUTRITION EDUCATION

A. COACH Program

Joshua Byrnes, Thomas Elliott, and Paul Scuffham are doctors that think nutrition and biomedicine must be realized by every doctor in the world. They suggested that doctors enroll their patients in the Coaching On Achieving Cardiovascular Health (COACH) Program, which has been proven to improve biomedical and lifestyle cardiovascular disease risk factors. The COACH Program is directed to improve the patient's lifestyle in an attempt to improve cardiovascular health. Through COACH, doctors admit patients into cardiac rehabilitation programs, frequently monitor disease management,

and provide 'health coaching' when taking medicine. To show that the COACH program is reliable, researchers have conducted studies to show how the COACH program changed the overall health of patients. As a result, "The COACH Program achieved a significant reduction in overall mortality" (Byrnes, 2018). The people enrolled in the COACH program statistically show that life expectancy of patients have increased.

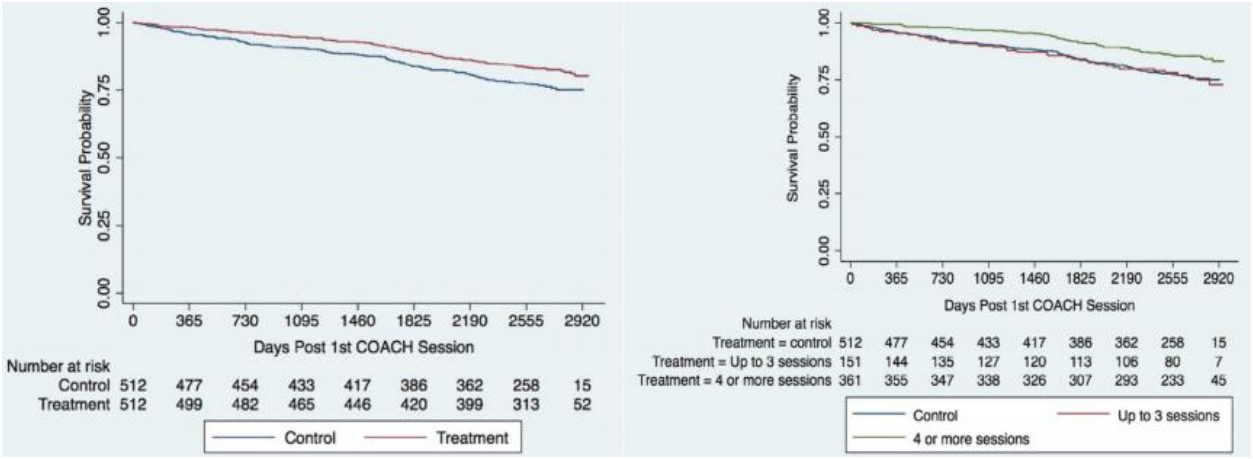

Figure 4: Life expectancy of patients comparing COACH vs usual care.

Greater efforts to encourage their patients to enroll in the COACH program is needed. Both doctors and patients need to be educated on new and innovative programs created to challenge traditional viewpoints on medicine. The program is a viable way to learn about lifestyle medicine, but also a great health care provider as it is affordable and beneficial for patients.

B. Doctors as Storytellers

Vincent Baty is a medical doctor who has taken a less conventional but important approach to nutrition education. Hospitals should have skilled medical 'storytellers' who can have reliable information about nutrition which they can tell their patients. The reason for this is that it improves patient-physician relations (Baty, 2018). In the field of physical training and nutrition, the physical trainer or coach ensures in keeping a constant communication and relationship with the clients. Many doctors like Baty believe that this format can solve the issues regarding the lack of nutritional education of doctors therefore, decreasing rates of diseases. Baty suggests that medical storytellers can provide meaningful and efficient information of scientific messages on nutrition, the prevention of many diseases, and the representation of the bacterial universe and the meaning of symbiosis for our patients (Baty, 2018).

In line with being a storyteller and narrator, doctors can provide critical and encouraging messages as well. Doctors who are part of the Academy of Nutrition and Dietetics shape physicians to become encouraging, nutrition-savvy doctors. Such doctors can encourage healthy eating messages that emphasize a balance of food and beverages to the community. And so, doctors can share to patients, "Proactive, empowering, and practical messages that emphasize the total diet approach promoting positive lifestyle changes" (Baty, 2018). Healthy eating public corporations such as 2010 Dietary Guidelines for Americans, DASH (Dietary Approaches to Stop Hypertension) Diet, MyPlate, Let's Move, Nutrition Facts labels, Healthy People 2020, and the Dietary Reference Intakes have spread healthy eating messages as the need for nutrition education for doctors is dire. Such corporations believe that to increase the effectiveness of nutrition education in influencing good food choices, then skilled nutrition physicians and doctors need to use appropriate nutrition knowledge and evidence-based strategies. However, doctors must not be simply stuck on telling patients what not to eat. Rather, doctors should also promote what to eat for a beneficial lifestyle. Studies have shown, "Almost two thirds (62%) of American adults report being "more interested in hearing about what to eat, rather than what not to eat" (Baty, 2018). It is important and obvious for people to know what to avoid for healthy eating habits. However, many American adults are still uninformed about what kinds of food are consumable for health benefits. Health corporations encourage healthy eating, but realize that it is most effective when done so by doctors. This is because most patients look to doctors for nutritional advice (as stated earlier). Therefore, 'doctor messengers' with a deep understanding of nutrition, have a responsibility to communicate unbiased food and nutrition information that is culturally sensitive, scientifically accurate, medically appropriate, and implemented so that the patient can understand.

C. Medicinal Foods and Cooking Education

Vanessa Garcia Larsen is a respiratory epidemiologist who believes that evidence-based 'medicinal food' is fundamental in modern times to improve the understanding of the role of risk factors on diseases. For Larsen, an example of medicinal and healthy food can be seen in the Mediterranean diet. Larsen notes that Mediterranean diet has natural sources of antioxidants with anti-inflammatory properties. Various cardiologists have attested to the Mediterranean diet as well, and the health benefits it has for the heart. As a result of American's poor dietary lifestyle, Ischemic heart disease (a disease influenced markedly by dietary factors) is the condition most responsible for health-related premature deaths and decrease in life expectancy. A solution that cardiologists with nutritional understanding suggested to patients with Ischemic heart disease, was taking on the Mediterranean-style diet since it statistically showed a 30% reduction in major cardiovascular events such as strokes (Devries, 2014). Larsen also believes that if the medical field adapted the evidence-based promotion of healthy food, then it will represent a major tool to improve the health of the overall population of the world. As one can deduce by Larsen's research, there is already enough evidence that can provide proof to patients that healthy foods can help cure and improve the heart. For example, The Lyon Mediterranean Diet Heart Study shows a study where there was a 72% reduction of cardiovascular illnesses and diseases because of the recommendation of whole foods, plant-based diet that was low in refined carbohydrates and animal products (Devries, 2014).

Another evidence-based health diet can be seen in the vitamin A supplementation in Nepal. According to Larsen, "Large trials on vitamin A supplementation in Nepal have shown a significant decrease in mortality in vulnerable populations of children" (Larsen, 2018). The country of Nepal has suffered from population decrease due to deaths caused by malnutrition. And as a response, the Nepal government issued a mandatory program for children to intake vitamin A supplements. The program has proved to be a success, and the population decrease has stopped ever since. England has also suffered from similar issues due to the endemic deficiency that is usually seen in the general English population. Therefore, "Public Health England recommends that all those above age 1 year take a vitamin D supplement on a regular basis to counteract the health effects" (Larsen, 2018). This has also shown promising results for the population of England. However, Larsen implies that evidence-based health supplements are not being acknowledged and should be emphasized more (by doctors) as major health issues arise. Thus, Larsen believes that nutrition is key to the decrease of chronic diseases.

Also, Dr. Reddy journalled the positive results that came from implementing plant-based nutrition in his physician work with positive results. Reddy wrote, "I started meeting on a regular basis with our primary care physicians, specialists, dieticians, and nurses to discuss the power of whole food, plant-based nutrition in disease modification and risk reduction" (Reddy, 2018). Dr. Freeman also noticed the beneficial effects after applying plant-based nutrition into his practice. The outcome showed, "At the end of 3.7 years of follow-up, only 1 out of the 177 adherent patients had a cardiovascular event, while 13 of the 21 nonadherent patients went on to have cardiovascular events" (Reddy, 2018). From these results, one can see how implementing nutritional based practices in physician work can remarkably improve the health of patients.

Doctors Stephen Devries and James E. Dalen even recommended physicians and trainees to learn cooking in order to better understand food and nutrition. Devries and Dalen endorsed a three and a half days program of nutrition related lectures and cooking shows in which doctors can learn how to nutrition counsel. The results from the cooking programs have successfully endeavored doctors to apply dietetic and nutritional counseling into their practice. Devries and Dalen observed, "A 3.5-day program, Healthy Kitchens, Healthy Lives, that combines nutrition-related lectures and 'hands-on' cooking sessions was successful at 3-month follow-up in changing physicians' dietary practices and their propensity to offer nutritional counseling." (Devries, 2014). They have also suggested physicians and trainees to go on free web-based nutrition curriculums to enhance their knowledge of nutrition. University of North Carolina's Nutrition in Medicine project as well as University of Arizona Center for Integrative Medicine have shown to provide such services and curriculum.

D. Guidelines and Interventions

While nutrition education for doctors and medical students are important, so is the application and distribution of guidelines for health practitioners. It is essential to provide a detailed summary of the many fundamental concepts of lifestyle medicines, nutrition, and daily activities such as physical activity, proper nutrition, weight management, and fitness awareness. Following this detailed summary will lead to prevention and treatment of chronic diseases such as coronary heart disease, diabetes, obesity, and cancer. Recognition of lifestyle medicine practices and guidelines is a key

component of keeping proper health and preventing life threatening diseases. Although nutrition is a key component for good health, evidence shows that nutrition guidelines and nutrition recommendations for many decades have been ignored by the majority of the population and only a few Americans follow the guidelines. The Strategic Plan for 2020, made by the American Heart Association, realized, "Only 5% of the adult population of the United States practice all of the positive lifestyle measures known to significantly reduce the risk of developing cardiovascular disease (CVD)" (Rippe, 2018). This is because most physicians feel that they have inadequate education in nutrition even though they know that nutrition is very beneficial to health. This is why the American College of Sports Medicine launched the "Exercise is Medicine®" (EIM) Initiative in order to help and work with doctors in keeping up the patients' physical activities and dietary lifestyle (Rippe, 2018). This is why it is important to have interventions implemented together with the guidelines.

Megan C. Whatnall, Amanda J. Patterson, and several other doctors have applied brief interventions to their meetings with patients. From their experiences, they have noticed that patients are more likely to apply nutritional practices when providing them with intervention programs. Therefore, Whatnall and Patterson suggest that doctors should brief interventions that include specific advice, reliable information to the individual, as well as nutrition education. Brief nutrition interventions present a simple, adaptable, and cheap strategy to improve nutrition and dietary behavior. From their studies and research, they believe that brief interventions could increase the education of nutrition for patients, as well as showing favorable outcomes. Whatnall and Patterson have noticed, "In three of these studies, intervention participants reported greater reductions in total fat intake compared with controls, one to six months post intervention" (Whatnall, 2017). Across the many studies, the most effective intervention was the one providing education and instructional feedback. Feedbacks mostly include positive reinforcement in order to motivate patients to intake more fruits and vegetables. This could then, "Affect short-term change in dietary behaviour, particularly for fruit, vegetable and fat intake, with limited evidence for longer-term maintenance of behaviour change" (Whatnall, 2017). Nutrition interventions also aim to practice skill building, instructing skills, problem solving, action planning, and self-belief. This is because nutrition interventions do not aim to strictly monitor the patients' dietary restrictions, but rather to build the skills of positive self-talk and inner self-confidence. This in effect has proven to show more long-term behavior changes.

E. Implementation of Registered Dietitian Nutritionists

Doctors Bonnie T. Jortberg and Michael O. Fleming viewed RDNs as important figures in a medical team, since they could provide care coordination, evidence-based care, and quality-improvement leadership. However in modern medical teams, many do not include RDNs in their team as RDNs are not very common. One of the most significant barriers to integrating RDNs into primary care has been an insufficient reimbursement model. The authors of the article are trying to indicate the RDN model to show that more people need to become RDNs as they are such an integral part of the team. They believe the solution to this issue is to show a model and statistics of the RDNs and state the benefits of being a RDN. A model to follow is the country of Canada, as the Canadian healthcare system in the city of Ontario has provided a 'family health team' within the primary physician care. And to this day, "there are 185 family health teams serving >3 million people in >200 communities across Ontario" (Jortberg, 2014). However, the United States has implemented health teams within physician care as well. The United States has passed, "The Affordable Care Act's Title III Section 3502 includes provisions specifically for the formation of community health teams to support the PCMH" (Jortberg, 2014). States such as North Carolina and Vermont have been conscientious about implementing this care act. Since such implementation, North Carolina has seen both the economic and health benefits that have come from the health teams. The Community Care of North Carolina saved, "Carolina saved $60 million in state fiscal year 2003, $124 million in state fiscal year 2004, and $231 million in state fiscal years 2005-2006, and health outcomes improved for patients with asthma and type 2 diabetes" (Jortberg, 2014). Even so, this does not solve the issues regarding the current lack of RDNs. This is why in 2013, the Academy of Nutrition and Dietetics created the 'Patient-Centered Medical Home/Accountable Care Organization Workgroup' under the larger inhouse group called the 'Coding and Coverage Committee'. In a sense, this was the Academy's 'call to arms' in hopes of recruiting and training new RDNs. The Academy's five steps to do so is by advocacy, positioning, collaboration, development, and resources. More specifically, the steps are to work with federal and state laws, especially with the passing of the care act, as well as collaborating with health management agencies, in order to empower and enhance current and future RDNs with knowledge, skill sets, and most importantly, job opportunities within primary care (Jortberg, 2014). Hopefully and most likely, this will give rise to more RDNs in the future. This will in effect then reduce the nation's leading cause of death, which is cardiovascular diseases.

V. CONCLUSION

In conclusion, physicians and medical education need more implementation of nutritional training and education. Due to the increased rates of cardiovascular diseases, such as heart attacks, remain the leading causes of death in the United States. Medical schools must make a greater stance to improve the current curriculum to produce nutritionally-trained doctors. In particular, doctors can gain immense support from RDNs who should work together with physicians to provide patients with a holistic outlook on their health. Though efforts still remain largely small, the COACH program, storytelling doctors, evidence-based health foods, and the efforts of the Academy of Nutrition and Dietetics can prove to be excellent supplemental sources for nutrition education. Last but not least, research remains largely minimal, especially in countries where holistic medicine is undervalued, such as Saudi Arabia. Therefore, global efforts should be developed by governing agencies as well as medical stakeholders to fight one of the leading causes of death not only in the United States but around the world.

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