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THE PREVALENCE OF NUTRITIONAL INTERVENTIONS AS TREATMENT IN THE AMERICAN HEALTHCARE SYSTEM: ASSESSING THE EXPERIENCES AND PERSPECTIVES OF ADULT PATIENTS

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Abstract

It is well known that good nutrition is effective in promoting optimal health and in preventing and treating disease. However, it is unclear whether this understanding is successfully being reflected in the treatment that patients are receiving from their healthcare providers in the United States. This study surveyed adult patients about their experiences in the American healthcare system regarding the treatment they've received from various providers, as well as their perspectives on the role of nutritional interventions in healthcare. The sample included 23 adults reporting one or more chronic illnesses and 19 adults never diagnosed with chronic illness. Medical treatment reportedly included prescription of medication more often than nutritional interventions from every type of healthcare provider and most medical specialties consulted, with larger gaps in some specialties than others. Study participants unanimously affirmed the importance of good nutrition in many aspects. However, study participants reporting chronic health conditions were in even stronger agreement than non-chronic patients in affirming the importance of making good nutrition a lifestyle, feeling they understood how to do so, and desiring that nutritional advice be given in healthcare settings. The responses of the sample surveyed suggest that nutritional interventions are not yet as prevalent as research suggests they should be, nor as prevalent as patients desire them to be, especially chronic disease patients. Similar further research should control for demographic variables, study larger populations, isolate specific chronic diseases, and include input from healthcare providers.

KEY WORDS: dietary interventions, chronic disease, healthcare reform, nutrition, American healthcare system, Western medicine

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Chapter I: Introduction

Timeless and truthful is the adage, “you are what you eat.” The idea that the human body is constituted by what it consumes is both intuitive and critically important for supporting human health. As food is the fuel that powers every function in the human body from a molecular level, good health requires a consistent supply of sufficient and high-quality nutrients in order to support all of its countless energetic processes that are occurring every moment of every day.

Given that dependence upon food is a characteristic that all ages, cultures, and walks of life invariably have in common, the relevance of the study of nutrition is indisputable. However, success in promoting optimal health of individuals and societies depends not only upon a general knowledge of the body’s needs, but also upon the mechanisms by which health is systemically cared for. Healthcare systems around the world are indispensable for the services and care that they exist to provide, and the enduring work of well-trained administrators and healthcare professionals has been the driving force of ensuring that populations receive the counsel and life-saving interventions that they need.

Of particular interest in recent years is how the importance of nutrition and the function of the healthcare system may intersect. Given that proper nutrition is one of the largest contributors to overall health, and that the healthcare system serves the sole purpose of caring for human health, it stands that nutrition would have a foundational role in medical education and clinical healthcare settings. However, laypeople and health professionals alike have increasingly expressed concern over whether this intersection is being realized to the extent that it should. Even though the knowledge of the importance of nutrition for health is ubiquitous in the scientific literature and popular media, food is not always a topic of conversation between healthcare providers and their patients. Particularly in the United States, healthcare constitutes

one of the greatest expenses to individuals and governments, but health metrics have been declining and disease rates skyrocketing. Scientific literature over the last several decades has richly contributed to a better understanding of how healthcare in America has taken the shape it exhibits today, how effective healthcare ought to work, and what role nutrition may have as a key component of it.

Chapter II: Literature Review

History of Western Healthcare: An Enduring Effort to Understand and Heal

Of primary importance in evaluating the current knowledge about something as broad as the Western healthcare system is establishing a firm foundation of background knowledge regarding why it initially came to be and how it originated. Western medicine emerged as its own unique entity in the 4th century, when the Hippocratic School of Medicine was founded by the famous Greek physician Hippocrates of Cos, establishing medicine as a professional discipline.[1] It distinguished medicine from other disciplines such as philosophy and theurgy, and facilitated the shift of medicine from solely empirical to rational and scientifically oriented.[1,2] In the world's first medical school, the human body was understood as a container of four "humours": blood, phlegm, black bile, and yellow bile.[1] Thus, health was understood to be equilibrium of these four humours, and disease understood to be disequilibrium.[1] Of the many works published by Hippocrates, the Hippocratic Oath is considered his greatest legacy, as it became a major source of medical ethics.[2] The Hippocratic Oath defined a moral code for medical practice and made a distinction between professional expertise and personal beliefs.[2] The Oath has become a major landmark in medical ethics, and Hippocrates is now considered the father of medicine in the Western world.[1,2]

Following the establishment of the Hippocratic School and the practice of medicine, new concepts of health were proposed many centuries later during the Renaissance.[1] Paracelsus (1493-1541), in his "Opus Paramirum" (1531), prescribed alchemistic remedies for diseases and proposed the famous idea of "similia similibus" – "things should be treated with similar things".[3] Later in that century, Italian physician and astronomer Girolamo Fracastoro (1478-1553) suggested that "seminaria" ("seeds" of disease) were responsible for pathologies and were transmitted from the sick to the healthy, an idea which anticipated the modern understanding of infectious diseases.[1]

European countries continued to be the primary driving force of the evolution of medicine through the 16th-18th centuries, as scholars began investigating anatomy and physiology for the first time.[1] Italian physician and anatomist Giovanni Battista Morgagni (1682-1771), who had personally performed hundreds of dissections, conveyed health as anatomical integrity, and disease as anatomical alteration of organs.[1] Shortly thereafter, Scottish physician John Brown (1735-1788) proposed the "excitability" theory of medicine, suggesting that external stimuli (named "exciting powers") must interact soundly with the inside of the body to stimulate right physiological responses; diseases were a result of influences that under- or over-stimulated the body.[1] Albrecht von Haller's (1708-1777) "Elementa physiologiae corporis humani", a masterpiece of experimental physiology, introduced the concept of "sensibility" and was the first work to describe contractile muscular capacity prompted by irritation.[1]

Only in the 19th century did more modern insights of health begin to emerge. The work of French philosopher and physiologist Claude Bernard (1813-1878) investigated the concept of the internal environment, leading to an understanding of homeostasis.[1] During this time, Morgagni's work was studied further in the investigation of organs, tissues, and cells, and cells

were found to contain triggering points of disease.[1] Finally, toward the end of the 19th century, the work of Louis Pasteur (1822-1895) led to discoveries of the principles of vaccines and the modern germ theory of disease.[4]

Medicine continued to become more molecular and sub-microscopic moving into the 20th century, and more multifaceted definitions of health began to emerge.[1] Progress was explosive and led to the major changes in classical paradigms which have become the foundation of modern medical knowledge.[1] Discoveries during this recent period included the groundbreaking and more well-known findings of Alois Alzheimer, Emil von Behring, Robert Koch, Rudolf Virchow, Watson and Crick, and many others, all of which have shaped science and medicine into what they are today.[5,6]

This era also saw the rise of pharmacology as a contributor to healthcare.[7] Research investigating drug development was still limited to relatively primitive methodologies from 1850-1945, but during the second World War began large-scale development of penicillin, which marked a significant milestone in medicine and initiated the development of many other antibiotics.[7] In the 1970s, pharmacology and the pharmaceutical industry began transitioning into research drawing more heavily upon the developing fields of molecular biochemistry and enzymology.[7] Since then, the pharmaceutical industry has flourished increasingly with scientific advances, the use of genetic engineering tools, and new drug discoveries.[7]

In addition to pharmaceuticals, the 1910s through the 1950s is also known as the era of vitamin discovery.[8] The development of vitamins began with the work of Casimir Funk (1884-1967) leading to the isolation of thiamine, subsequently synthesized as vitamin B_1, and within a few decades all major vitamins had been synthesized.[8] The availability of vitamin

supplementation led to dietary strategies for many vitamin deficiency conditions, and the vitamin supplement industry took off.[8]

Beginning in the 1960s, medical practice in the Western world experienced a radical shift. Historically, the physician-patient relationship was based solely upon the physician's best healing efforts, but in the last century it has experienced compromises in order to make an equal priority of various moral and legal obligations, such as guaranteeing patient autonomy and justice.[2] This increased burden is largely due to the additional accountabilities that have been placed upon medical practice in recent years. Whereas physicians once had the sole right and duty to dictate treatment, accountable only to themselves and others in the medical profession, they are now also accountable to patients, hospitals, managed healthcare organizations, medical licensing and regulatory authorities, courts of law, and other institutions.[9] Physicians are also expected to consider the needs of society, such as distributive justice concerns.[9] Increased accountability and its associated complications were partly due to several reforms throughout the 20th century, including presidential efforts toward government funding and management of healthcare.[10] Some well-known examples of these influential changes include the Social Security Act of 1965 (establishing Medicare and Medicaid) and the Affordable Care Act of 2010.[10] In addition to political advances, technological advances also demand that physicians constantly adapt and maintain ethical standards under new situations; exemplary modern issues include abortion, euthanasia, and assisted reproductive techniques (ARTs). Therefore, with so many other issues to balance in addition to patient health, patient-centered care has become significantly more nuanced and challenging. Physicians must employ general knowledge about supporting human health while also accounting for a host of other factors that have become necessary and integral in modern healthcare practice.

Despite new advances and challenges, Western medicine strives to maintain the patient-centered healthcare model under which it first originated, enriched by massively expanded knowledge and evidence-based practices. As opposed to forerunning approaches to medicine, the modern Western approach is strongly scientific and based foundationally upon hypothetical deduction, in which general observations lead to hypotheses, research plans, experimental data collection, critical analysis, and ultimately the best possible forms of care.[11] Regarding medical training, there are about 2600 medical schools worldwide, training physicians in upwards of 24 major medical specialties, not including countless continually emerging subspecialties.[12,13] Western-trained physicians are trained to detect and treat disease, and to lead a team of other healthcare professionals who work together to care for the patient holistically.[11] The overall role of primary care physicians is to provide patients with the first-contact, continuous, comprehensive, and coordinated care they need, a role which serves as the functional backbone of the healthcare system.[14–16] Physicians may also train for a medical specialty in which their care is more highly focused upon a specific area of healthcare and tailored toward certain patient populations, such as pediatrics, general surgery, or radiology.[13] Collectively, physicians are seen as having less of an authoritative role in patient health than in centuries past, and more of a supporting role as consultants or instructors to their patients.[9]

In addition to physicians, new professions offering primary care have arisen to meet increased demand for accessible healthcare, including physician assistants and nurse practitioners.[17] These healthcare practitioners are assuming an ever-increasing role in healthcare alongside physicians.[16] The overall goal of physicians, physician assistants, nurse practitioners, and all healthcare providers practicing within a patient-centered care model is the same: to provide care that prioritizes the patient and includes the patient in all clinical decisions along

with the rest of the professional healthcare team, to optimize success in achieving health improvement for the patient.[18] This goal is the ideal outcome that Western healthcare strives for.

In medical practice, the goal of promoting health is shaped by a more mature definition of health itself that has only continued to become more broad and all-encompassing. In 1946, the World Health Organization defined health in the preamble of its constitution as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity," a definition that it still affirms today.[19] This reveals the significant degree to which the general understanding of human health had expanded by the mid 20th century since earlier eras. Medical ethics have also evolved from the initial foundation laid by the Hippocratic Oath and now rest upon four governing principles: autonomy, beneficence, nonmaleficence, and justice.[20] It is the duty of the modern clinician to allow patients to make their own informed decisions about their health, do all that they can to help their patients, do no harm to their patients, treat patients equally, and allocate medical resources responsibly.

However, even with great advances and well-developed ideals, Western medicine is still imperfect, and suffers a wide range of problems. A common and legitimate criticism of the current model is that it is more reactionary than proactive. Compared to models of Eastern medicine in which promoting health is primary and treating disease becomes the focus only when diseases do occur, Western healthcare primarily detects and treats disease that has already occurred, largely due to how Western physicians are trained.[11] Therefore, diseases which may have been prevented are only addressed after onset, which is in many cases too late.

As a Western-based system, the American healthcare system suffers this criticism, as well as many others. The American healthcare system has become the most technologically advanced and specialized healthcare system in the world, with a well-trained workforce, high-

quality medical specialists, secondary and tertiary institutions, and robust research in the health sector.[16,21] However, these strengths have not successfully resulted in a strong healthcare system, particularly compared to other developed nations.[16] The United States has become notorious for high spending, largely due to expensive technologies and specialized procedures, but more money spent has not translated to better national health.[22] According to data from 2018 comparing the U.S. to other similarly developed countries, the U.S. has the lowest life expectancy; the highest suicide rates; the highest chronic disease burden, with more than 25% of adults reporting two or more chronic diseases such as diabetes, heart disease, or hypertension; a relatively low frequency of physician visits; among the highest rates of hospitalizations from preventable causes such as diabetes and hypertension; and the highest rate of avoidable deaths, suggesting that compared to peer nations the U.S. has poor access to primary care, prevention, and chronic disease management.[22] Obesity rates have shown a significantly increasing trend from 1999-2016, and in 2018 the obesity rate reached 42.4% of adults.[23] In 2018, 51.8% (129 million) adults were diagnosed with arthritis, cancer, COPD, coronary heart disease, athsma, diabetes, hepatitis, hypertension, stroke, weak or failing kidneys, or a combination of these conditions.[24] Researchers and medical professionals agree that statistics like these signal an urgent need for continued reform in the healthcare system.

The Importance and Effectiveness of Nutrition: The Key to Optimal Health

As the American healthcare system has evolved and worked to accommodate changing needs and revolutionized systems, literature studying the importance of quality nutrition for supporting human health has also been simultaneously accumulating. Nutrition science became more of a priority in America during the late 20th century, when fear of food shortages during

World War II and the Great Depression became widespread.[8] This resulted in the development of recommended daily allowances (RDAs), which provided guidelines for daily intake of calories and essential nutrients to guide the prevention of deficiency diseases.[8] Food assistance programs likewise were developed.[8] In the decades to follow, economic growth and increased production of staple foods fortified with vitamins and minerals led to a sharp decrease in malnutrition and vitamin deficiencies.[8] However, diet-related noncommunicable diseases increased, gaining recognition and leading to research that focused on the effects of dietary sugar and fat.[8] The 1970s-1990s was the period when diet-related chronic diseases began to arise, including obesity, type II diabetes, and cancers.[8] Nutritional guidelines were adjusted accordingly, emphasizing based on the current research to avoid fat, sugar, and sodium, among other recommendations.[8] Although nutrition science and research continued, it still did not overlap with the healthcare industry, which was at the time being heavily influenced by the rapidly growing pharmaceutical industry.

However, over the last two decades, rigorous research including well-designed metabolic studies, prospective cohorts, and randomized clinical trials have provided accumulating evidence affirming the significant influence of nutrition upon many aspects of human health, transforming nutrition science and highly supporting its relevance in promoting good health.[25] At the molecular level, it has now been thoroughly evidenced by diverse research that dietary habits influence glucose-insulin homeostasis, oxidative stress, endothelial health, inflammation, function and concentration of lipoproteins, hepatic function, cardiac function, adipocyte metabolism, metabolic expenditure, metabolite synthesis, digestion, weight regulation pathways, and visceral adiposity, all of which carry profound implications for overall physical health.[25,26] Mental health and cognitive function are also strongly dependent upon dietary factors; food

intake and food quality powerfully impact the overall anatomy and physiology of the brain, which depend upon the availability of sufficient essential nutrients.[27,28] Diet composition directly affects endogenous gut hormones, neurotransmitters, neuropeptides, and gut microbiota, all of which are tied to brain function.[29–33] Even subjective measures of mental wellbeing are improved by a healthy diet; research shows an association between consumption of fruits and vegetables and increased reported happiness, better mental health, and improved wellbeing.[34–38]

In addition to supporting physical and mental health, nutrition can serve as a key component in the prevention and treatment of chronic disease. In cases of chronic disease, unhealthy diet is usually an associated risk factor, but dietary interventions instituting healthful, plant-based diet patterns have been shown to improve health outcomes for a variety of chronic diseases. For diabetes patients, reducing refined carbohydrates while increasing proteins and vegetable fats may help with glycemic control.[39,40] Plant-based diet interventions are suggested to be useful in treatment of painful diabetic neuropathy.[40] For hypertension patients, an effective intervention in prevention and management of high blood pressure is adoption of a plant-based diet rich in whole grains and low-fat dairy products.[41] Critical to preventing recurrent stroke is limiting intake of sodium and red meats, and it is recommended that patients consume a diet rich in fruits, vegetables, whole grains, legumes, and beneficial oils.[42,43] The influence of diet on acne vulgaris, a common chronic skin condition, has been researched for decades; lower glycemic load has been associated with reduced acne lesions, whey protein in dairy contributes to acne development, increasing omega-3 and omega-6 fatty acid intake such as those in fish and healthy oils is beneficial, and probiotic administration has shown promising results.[44] Strategic diet therapy can be used in treatment of polycystic ovary syndrome (PCOS), an endocrine disorder in women, to improve insulin resistance as well as metabolic and reproductive functions; research

recommends limited intake of simple sugars, refined carbohydrates, and saturated and trans fatty acids, as well as increased intake of lower glycemic foods.[45] Continued research is currently being done to investigate the effects of nutritional interventions for other chronic diseases as well, such as chronic kidney disease, rheumatoid arthritis, Crohn's disease, and others.[26]

Specific nutritional interventions such as diets for targeted diseases have also been investigated and shown to produce improved health outcomes. One study published in 2020 administered a 16-week low-fat vegan diet to a population of adults and showed significantly improved cardiometabolic outcomes compared to the control group (lower rates of obesity, hypertension, type 2 diabetes, and heart disease).[46] Many meta-analyses conducted throughout the last decade suggest that for ADHD patients, supplementation of omega-3 fatty acids reduces symptoms, supplementation with micronutrients is associated with decreased aggression and improved emotional regulation in children, and a diet lower in saturated fat and refined sugar may decrease risk of ADHD or hyperactivity.[47–50] The widely studied Dietary Approaches to Stop Hypertension (DASH) diet is shown to prevent and manage hypertension, especially when coupled with dietary sodium reduction, indicating great potential for clinical application.[41] Most cutting-edge is the ketogenic diet, a diet high in fat and very low in carbohydrates; the keto diet is receiving substantial attention from the nutrition research community and general public as research suggests potential for effective treatment of cancers, neurodegenerative conditions, obesity, and especially type 2 diabetes.[51–54] However, more high-quality clinical trials are urgently needed. Finally, the Mediterranean diet, which emphasizes fruits, vegetables, whole grains, healthy fats, and seafood, has become well known as one of the healthiest diets; it has been shown to improve cognitive function, reduce depression risk, reduce anxiety and improve mood in adults with major depressive disorder, improve subjective wellbeing in various

populations, reduce inflammation, contribute to the prevention of brain disease, prevent stroke, prevent myocardial infarction, and treat heart disease.[36,37,42,55–59] These research findings, together with many others in the larger body of literature, show conclusively that dietary habits have the power to influence many health factors including cardiometabolic health, physiology, body composition, cognitive function, aging, and even chronic disease outcomes.

Considering the importance of diet and the effectiveness of dietary interventions that have now been revealed, it is no surprise that the highest risk factor for death and disability, both in the U.S. and worldwide, is suboptimal diet.[25,60,61] Malnutrition is a phenomenon which has become very widespread; it now affects an estimated one in three people globally.[62] The term encompasses a variety of conditions which result from a lack of proper nutrition, meaning that the body is not receiving sufficient nutrients to ensure optimal functioning; those considered to be suffering from malnutrition include individuals who are underweight, have stunted growth, have micronutrient deficiencies, or are overweight or obese.[63] Thus, better nutrition is an essential first step in improving health outcomes globally and in the United States.

Applying Knowledge About Nutrition to Healthcare: Is It Working?

Extensive research spanning several decades has made it unequivocally apparent, both to medical professionals and to the general populace, that proper nutrition is indispensable for the cause of maintaining good health. Given that the purpose of the healthcare system is to support human health, the knowledge of nutrition's role in supporting health raises the consideration of how nutrition may need to be incorporated into providing healthcare that achieves its true purpose.

The view of food as medicine has been gaining a following amongst healthcare providers and researchers particularly since the turn of the 21st century.[64,65] Prevention of disease through adjustment of behavioral risk factors such as poor nutrition has become all the more pertinent as disease rates continue to rise. The general understanding of chronic disease held by physicians and medical professionals is continually being challenged and reformed as new research surfaces.[66] Chronic disease has often been considered irreversible, but the application of a nutrition-first approach shows promise in producing better health outcomes.[66] Given the staggering prevalence of chronic diseases, the need to investigate new and more effective methods such as including nutritional interventions in treatment of these diseases has become a consensus.[66]

The World Health Organization has encouraged that the health sector undertake a promotive, preventative, curative, rehabilitative, and palliative role in addressing malnutrition as essential nutrition actions for supporting human health. This effort would include providing support for a healthy diet and encouraging consumption of foods fortified with vitamins and minerals.[63] For example, reducing the intake of free sugars to below 10% of energy intake, reducing salt intake to less than 5 grams daily, increasing potassium intake, and eating five portions of fruits and vegetables per day has been recommended.[63] Contributory efforts in the health sector would also include nutritional care at key points during infancy, childhood, adolescence, adulthood, and pregnancy which only medical professionals can make.[63] Carrying out these essential nutrition actions successfully would require a holistic and integrated approach to health in every healthcare setting.[63]

However, many factors oppose the success of healthcare providers in fulfilling this goal to help fight malnutrition and promote healthy diet in individuals and communities. Firstly is a

peculiar absence of nutrition education in medical schooling. Given the increasing prevalence of literature affirming the effectiveness of nutrition in promoting health, it stands that medical school curricula would incorporate a significant amount of training in nutrition for future physicians. However, although a minimum of 25 classroom hours in nutrition has been recommended, there has been little progress in achieving this goal.[67] Surveys show that 71% of medical schools provide less than this recommended minimum, and 36% provide less than half.[67] Moreover, in U.S. medical schools, hours of nutrition instruction have in fact declined in recent years.[67] Most primary care residencies do not meet this need either.[67] As it stands, no policies or laws ensure adequate regulation to equip future doctors in administering the effective nutritional treatments which are being discovered by the latest research; building knowledge and skills in this area is primarily at the discretion of individual healthcare professionals, often through continuing medical education requirements.[68]

In addition to limited education and training, healthcare providers may be prevented from improving patient health through nutritional interventions due to issues in patient adherence. Even when nutritional interventions are provided in a clinical setting, they may not be eagerly received or successfully applied by patients. As in every case of being recommended or prescribed a form of medical treatment from a healthcare provider, patients may well enough agree on the importance and effectiveness of implementing the suggested measures, but competing concerns regarding overall quality of life, potential increases in financial expense, and/or physical comfort may influence their desire or ability to translate them into action.[69,70] Optimizing patient adherence to dietary interventions must complement initial provision of advice and instructions in order to ensure that patients can follow through on recommended diet and behavioral changes in real-life settings.[71]

Considering the struggles and shortcomings of the American healthcare system, the poor and continually declining health of the nation, and the promise of nutritional interventions both in promoting overall health and in treating disease, what role does nutrition currently have in medical offices? Research suggests, and many clinicians and laypeople are beginning to agree, that "food is medicine" and deserves greater emphasis in the healthcare system. To what extent is this increasing inclination toward utilizing nutritional interventions in clinical settings being felt? Are healthcare providers managing to incorporate evidence-based nutritional interventions in the care they provide? Moreover, are patients willing and able to adhere to such interventions? This study aimed to answer these questions from the ground level by asking adult patients.

Chapter III: Methods

Study Design

A non-experimental, quantitative research design was used to address the study's topic. The study's research methodology was a survey research approach. A three-part survey complete with an initial research description and consent form was created using Google Forms as the research instrument, and advertised 1) via email to Southeastern University students and 2) via social media to individuals across the United States. After gaining consent and gathering basic demographic information, the survey assessed general healthcare experience, chronic illness experience, and personal stance on nutrition and healthcare. Responses were collected over a period of about one month and analyzed using statistical analysis techniques as well as the Google Forms survey analytics platform.

Participants

The study's sample of participants was selected through a non-probability, convenient sampling technique. Participants included adults aged 18 or older who had attended at least three office visits with one or more healthcare providers since the age of 18 which they could clearly recall. Healthcare providers which could satisfy this requirement included medical doctors (MDs), doctors of osteopathy (DOs), physician assistants (PAs), and nurse practitioners (NPs) who had been practicing at medical facilities in the United States for at least one full year. Office visits with a healthcare provider could have included routine health check-ups, consultations addressing specific health concerns, and/or receiving treatment for health conditions. Nutritional interventions they may have reported to have received from these healthcare providers included any provisions of dietary advice/recommendations and/or prescribed diet changes.

Survey Development

Based upon the literature regarding the goals of healthcare systems in supporting health and the evidence-based benefits that nutritional interventions can offer in reaching these goals, survey questions were designed to investigate the extent to which nutritional interventions are fulfilling this potential in healthcare settings. Questions were identified which would allow adult patients to share their experiences and perspectives as helpful evidence of the prevalence of nutritional interventions in American healthcare.

Three ideal categories of survey questions were identified: 1) general healthcare experience questions, 2) specific chronic illness questions, and 3) personal stance questions. General healthcare experience questions were designed to survey the typical frequency that patients had consulted healthcare providers, what types of healthcare providers they had

consulted, and what types of treatment they received. Specific chronic illness questions differentiated patients who had experienced chronic illnesses from healthier individuals, in order to assess how their medical treatment compared to those having only general health concerns. It also allowed current and former chronic disease patients to identify how their disease(s) had been treated, whether with prescription medication, nutritional interventions, neither, or both. Finally, personal stance questions served the purpose of demonstrating how laypeople with experience in the American healthcare system currently perceive the importance of nutrition, the role of nutritional interventions in healthcare, and the extent to which healthcare reform is needed. These included Likert-scale type questions as well as short answer questions. Personal stance Likert-scale type questions consisted of 11 statements about the importance of nutrition, integrating nutrition into one's lifestyle, and the role of nutrition in the American healthcare system, offering five answer choices to indicate extent of agreement with the statement. Personal stance short-answer questions gave opportunity for participants to elaborate on their experiences and perspectives.

Data Analysis

Three stages of data analysis were performed: descriptive statistical analysis, summative experiences and perspectives analysis, and descriptive and inferential statistical analysis by research question.

Descriptive Statistical Analysis

Descriptive statistical techniques were used to evaluate the study's demographic identifying information. Frequencies (n) and percentages (%) represented the specific descriptive

statistical techniques used to evaluate the study's primary demographic identifying variables of gender, age, ethnicity, health care consultation frequency, medical treatments status, medications status, and chronic condition status.

The internal reliability of study participant response to survey items on the study's research instrument was addressed using the Cronbach's alpha (*a*) statistical technique.[72] The evaluation of internal reliability was based upon study participant response to all survey items represented on the research instrument ($n = 11$) using the conventions of interpretation for Cronbach's alpha offered by George and Mallery.[73]

Summative Experiences and Perspectives Analysis

A summary of survey responses generated from the Google Forms survey analytics platform was used to create a quantitative summary of prescription medication treatments and nutritional interventions given by each category of healthcare provider, as well as by medical specialists from each individual medical specialty. A summary of responses to questions in the second section of the survey, which consisted of questions exclusively for current and former chronic disease patients, was used to create a quantitative summary of how chronic diseases had been treated by medical specialists. Responses to Likert-scale personal stance questions in the third section of the survey were summarized visually using graphs provided in the Google Forms analytics platform. Finally, responses to short answer personal stance questions were read and synthesized through qualitative analysis.

Descriptive and Inferential Statistical Analysis by Research Question

The study's topic and research problem were addressed through the statement of six research questions. Descriptive and inferential statistical techniques were used to address the study's six research questions. The probability level of $p \leq .05$ was selected as the threshold value for findings to be considered statistically significant for study purposes. Numeric effect sizes achieved in the study's analyses were interpreted using the conventions of Sawilowsky.[74] IBM's Statistical Package for the Social Sciences (SPSS v. 28) represented the statistical analytics platform specifically used for the analysis of study data.

The six identified questions investigated participant perceptions of: 1) good nutrition as important for health and wellness, 2) making good nutrition an integral part of lifestyle for the long term, 3) understanding how to incorporate good nutrition into daily lifestyle, 4) welcoming nutritional advice and recommendations from healthcare provider(s), 5) whether healthcare providers should give nutritional advice to their patients, and 6) making good nutrition an integral part of lifestyle, compared with preference for prescription medications over diet changes. Statistical data analysis was used to synthesize the data and answer these six key research questions.

Chapter IV: Results

Descriptive Statistical Analysis

Table 1. Descriptive Statistics Summary Table: Demographic Identifier Variables

Variable	*n*	%	Cumulative %
Gender			
Female	32	76.19	76.19
Male	10	23.81	100.00

Missing	0	0.00	100.00
Age			
18-25	33	78.57	78.57
Over 25	9	21.43	100.00
Missing	0	0.00	100.00
Ethnicity			
White	27	64.29	64.29
Non-White	15	35.71	100.00
Missing	0	0.00	100.00
Health Care Consult Frequency			
Annually or Over a Few Years	24	57.14	57.14
Few Times per Year	9	21.43	78.57
Every Few Months or Monthly	9	21.43	100.00
Missing	0	0.00	100.00
Medical Treatment Status			
Have not Sought Medical Treatment	20	47.62	47.62
5 Years or Less	11	26.19	73.81
6 -10 Years	6	14.29	88.10
11-20 Years	3	7.14	95.24
Over 20 Years	1	2.38	97.62
Missing	1	2.38	100.00
Medications			
None	30	71.43	71.43
1 to 5	11	26.19	97.62
6 to 10	1	2.38	100.00
Missing	0	0.00	100.00
Chronic Condition Status			
No Chronic Health Issues	19	45.24	45.24
Chronic Health Issues	23	54.76	100.00
Missing	0	0.00	100.00

Table 1 contains summary of findings for the descriptive statistical evaluation of the study's demographic identifying information.

Table 2. Internal Reliability Summary Table

Scale	No. of Items	α	Lower Bound	Upper Bound
All Items	11	.74	.65	.84

Table 2 contains a summary of findings for the evaluation of the overall internal reliability of study participant response to survey items on the study's research instrument. The lower and upper bounds of Cronbach's α were calculated using a 95.00%

confidence interval. The level of internal reliability achieved in the study was considered acceptable to good at a = .74 (95% CI .65 to .84).

Summative Experiences and Perspectives Analysis

Table 3. Healthcare Providers and Medical Specialties: Treatments Given

Healthcare Provider Visited	Number of Participants Treated (% of total population)	Number of Participants Prescribed Medication (% of population treated)	Number of Participants Given Nutritional Advice (% of population treated)
Primary Care Providers	41 (96.7%)	36 (87.8%)	33 (80.5%)
Urgent Care Clinicians	25 (59.5%)	24 (96.0%)	6 (24.0%)
Emergency Room Clinicians	19 (45.2%)	9 (47.4%)	3 (15.7%)
Medical Specialists	28 (66.7%)	24 (85.7%)	14 (50.0%)
Dermatologists	26 (63.4%)	18 (69.2%)	6 (23.1%)
Pediatricians	24 (58.5%)	16 (66.7%)	16 (66.7%)
Obstetrician/Gynecologists	12 (29.3%)	10 (83.3%)	4 (33.3%)
Radiologists	10 (24.4%)	1 (10.0%)	0 (0.0%)
Neurologists	9 (22.0%)	3 (33.3%)	2 (22.2%)
Cardiologists	8 (19.5%)	3 (37.5%)	4 (50%)
Podiatrists	7 (17.1%)	2 (28.6%)	0 (0.0%)
General Surgeons	6 (14.6%)	2 (33.3%)	1 (16.7%)
Psychiatrists	6 (14.6%)	4 (66.7%)	2 (33.3%)
Urologists	6 (14.6%)	5 (83.3%)	1 (16.7%)
Immunologists	5 (12.2%)	3 (60.0%)	2 (40.0%)
Pulmonologists	4 (9.8%)	4 (100.0%)	0 (0.0%)
Orthopedic Physicians	3 (7.2%)	2 (66.7%)	1 (33.3%)
Gastroenterologists	2 (4.9%)	1 (50.0%)	1 (50.0%)
Hematologists	1 (2.4%)	0 (0.0%)	0 (0.0%)

Table 4. Treatments Given by Medical Specialists for Chronic Diseases

Medical Specialist Visited	Number of Participants with Chronic Illness Treated	Number of Participants Prescribed Medication (% of population treated)	Number of Participants Given Nutritional Advice (% of population treated)
Pediatricians	7	6 (85.7%)	5 (71.4%)

Dermatologists	5	5 (100.0%)	2 (40.0%)
Psychiatrists	4	4 (100.0%)	3 (75.0%)
Cardiologists	3	2 (66.7%)	2 (66.7%)
Obstetrician/Gynecologists	3	3 (100.0%)	1 (33.3%)
Pulmonologists	3	3 (100.0%)	0 (0.0%)
Gastroenterologists	2	2 (100.0%)	2 (100.0%)
General Surgeons	2	1 (50.0%)	0 (0.0%)
Neurologists	1	1 (100.0%)	1 (100.0%)
Immunologists	1	1 (100.0%)	1 (100.0%)
Podiatrists	1	0 (0.0%)	0 (0.0%)
Radiologists	1	1 (100%)	0 (0.0%)

Table 5. Chronic Diseases Represented in Population Studied

Chronic Disease	Number of Participants with Chronic Disease (% of total chronic patients)
asthma	9 (39.1%)
hypertension (high blood pressure)	6 (26.1%)
major depressive disorder	6 (26.1%)
generalized anxiety disorder	6 (26.1%)
attention-deficit/hyperactivity disorder (ADHD)	4 (17.4%)
polycystic ovarian syndrome (PCOS)	3 (13.0%)
obesity	2 (8.7%)
arthritis (osteoarthritis and rheumatoid)	2 (8.7%)
diabetes (type I)	1 (4.3%)
diabetes (type II)	1 (4.3%)

heart disease	1 (4.3%)
cancer	1 (4.3%)
chronic obstructive pulmonary disease (COPD)	1 (4.3%)
fibromyalgia	1 (4.3%)
irritable bowel syndrome (IBS)	1 (4.3%)

Figure 1. Likert-Scale Personal Stance Question #1 Results

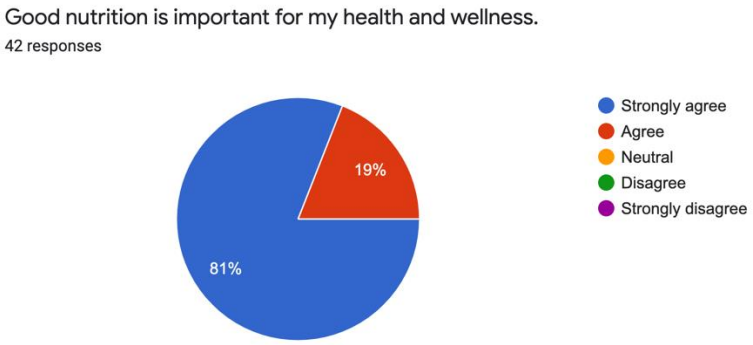


Figure 2. Likert-Scale Personal Stance Question #2 Results

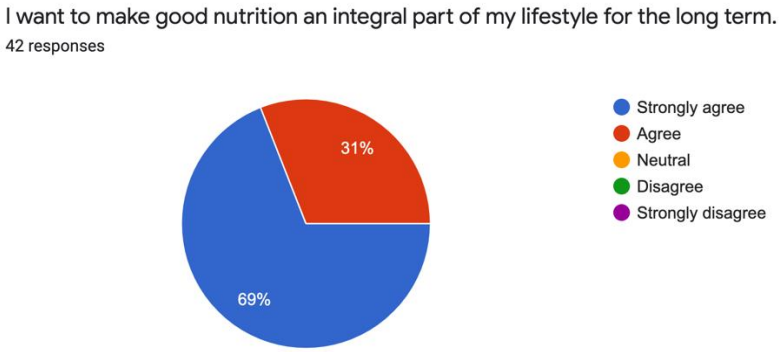


Figure 3. Likert-Scale Personal Stance Question #3 Results

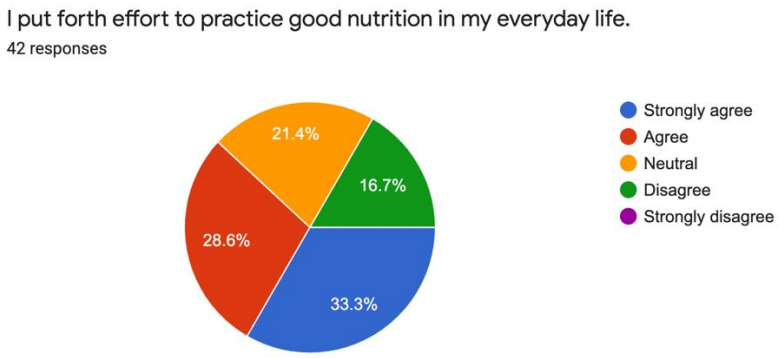


Figure 4. Likert-Scale Personal Stance Question #4 Results

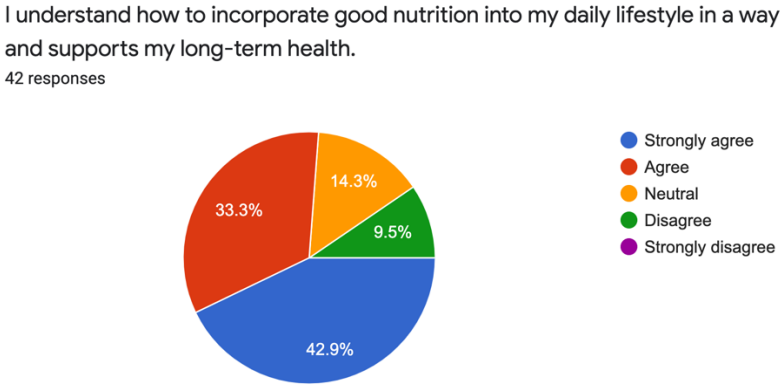


Figure 5. Likert-Scale Personal Stance Question #5 Results

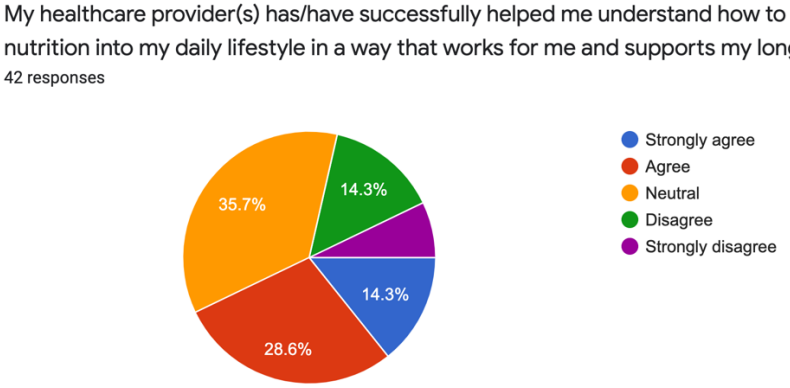


Figure 6. Likert-Scale Personal Stance Question #6 Results

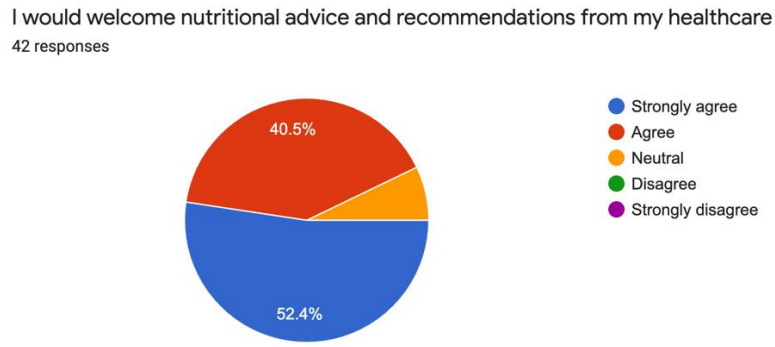


Figure 7. Likert-Scale Personal Stance Question #7 Results

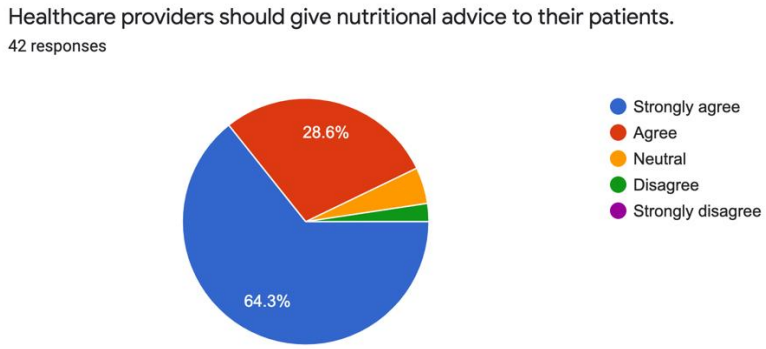


Figure 8. Likert-Scale Personal Stance Question #8 Results

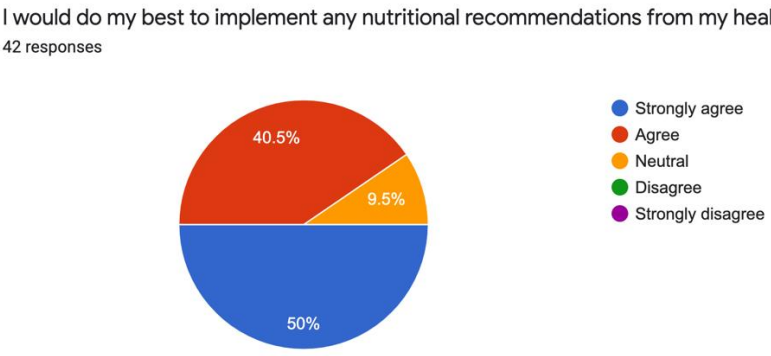


Figure 9. Likert-Scale Personal Stance Question #9 Results

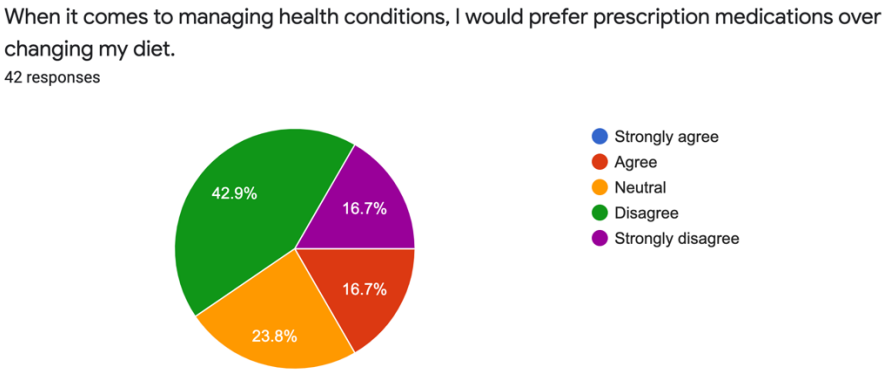


Figure 10. Likert-Scale Personal Stance Question #10 Results

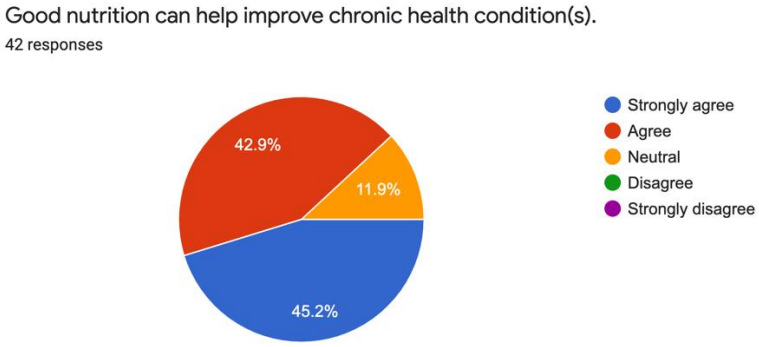
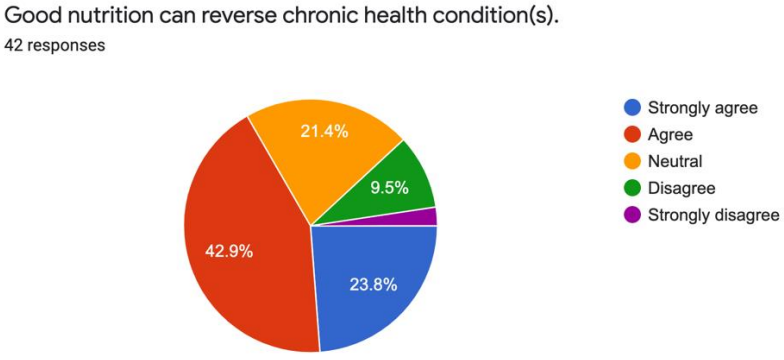


Figure 11. Likert-Scale Personal Stance Question #11 Results



Descriptive and Inferential Statistical Analysis by Research Question

Research Question #1: To what degree did study participants perceive good nutrition as important for their health and wellness?

Study participants were in complete agreement with 19.0% agreeing (n = 8) and 81.0% strongly agreeing (n = 34) with the notion that good nutrition is important for health and wellness. The statistical significance of study participant mean score response to perceptions of good nutrition as important for health and wellness was addressed using the one sample *t* test statistical technique. As a result, the mean score response for perceptions of good nutrition as important for health and wellness was statistically significant ($t_{(41)} = 29.51$; $p < .001$). The magnitude of effect for study participant response was, moreover, considered huge at $d = 4.55$. Table 6 contains a summary of findings for study participant perceptions of good nutrition as important for health and wellness.

Table 6. Summary Table: Perceptions of Good Nutrition as Important for Health and Wellness

Variable	*M*	*SD*	μ	*t*	*p*	*d*
Good Nutrition/Health & Wellness	4.81	0.40	3	29.51	< .001	4.55

Degrees of Freedom for the *t*-statistic = 41. *d* represents Cohen's *d.*

Research Question #2: Was there a statistically significant difference in study participant perceptions of making good nutrition an integral part of lifestyle for the long term by participant chronic health issue status?

The statistical significance of mean score difference in study participant perceptions of making good nutrition an integral part of lifestyle for the long term was addressed using the *t* test of Independent Means. As a result, the mean score difference of 0.30 favoring the perceptions of

study participants with chronic health issues was statistically significant ($t_{(32.98)} = 2.10$; p = .02). The magnitude of effect for the difference in perceptions of making good nutrition an integral part of lifestyle for the long term was considered between medium and large at $d = .66$. Table 7 contains a summary of findings for study participant perceptions of good nutrition as an integral part of lifestyle for the long term by chronic health issue status.

Table 7. Summary Table: Perceptions of Making Good Nutrition an Integral Part of Lifestyle for the Long Run Comparison by Chronic Health Issues Status of Participants

	No Chronic Health Issues		Chronic Health Issues				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
Good Nutrition for the Long Run	4.53	0.51	4.83	0.39	2.10	.02*	0.66

N = 42. Degrees of Freedom for the *t*-statistic = 32.98. *d* represents Cohen's *d.* **p* < .05

Research Question #3

Was there a statistically significant difference in study participant perceptions of understanding how to incorporate good nutrition into daily lifestyle in a way that works and supports long-term health by participant chronic health issue status?

The statistical significance of mean score difference in study participant perceptions of understanding how to incorporate good nutrition into daily lifestyle in a way that works and supports long-term health was addressed using the *t* test of Independent Means. As a result, the mean score difference of 0.65 favoring the perceptions of study participants with chronic health issues was statistically significant ($t_{(29.16)} = 2.16$; p = .02). The magnitude of effect for the difference in perceptions of understanding how to incorporate good nutrition into daily lifestyle in a way that works and supports long-term health was considered between medium and large at

d = .68. Table 8 contains a summary of findings for study participant perceptions of understanding how to incorporate good nutrition into daily lifestyle in a way that works and supports long-term health by chronic health issue status.

Table 8. Summary Table: Perceptions of Understanding How to Incorporate Good Nutrition into Daily Lifestyle in a Way that Works and Supports Long-Term Health Comparison by Chronic Health Issues Status of Participants

	No Chronic Health Issues		Chronic Health Issues				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
Understanding	3.74	1.15	4.39	0.72	2.16	.02*	0.68

N = 42. Degrees of Freedom for the *t*-statistic = 29.16. *d* represents Cohen's *d.*

Research Question #4: Was there a statistically significant difference in study participant perceptions of welcoming nutritional advice and recommendations from healthcare provider(s) by participant chronic health issue status?

The statistical significance of mean score difference in study participant perceptions of welcoming nutritional advice and recommendations from healthcare provider(s) was addressed using the *t* test of Independent Means. As a result, the mean score difference of 0.44 favoring the perceptions of study participants with chronic health issues was statistically significant ($t_{(40)} = 2.38$; $p = .01$). The magnitude of effect for the difference in perceptions of welcoming nutritional advice and recommendations from healthcare provider(s) was considered approximating a large effect at *d* = .74. Table 9 contains a summary of findings for study participant perceptions of welcoming nutritional advice and recommendations from healthcare provider(s) by chronic health issue status.

Table 9. Summary Table: Perceptions of Welcoming Nutritional Advice and Recommendations from Health care Providers Comparison by Chronic Health Issues Status of Participants

	No Chronic Health Issues		Chronic Health Issues				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
Welcoming Advice	4.21	0.63	4.65	0.57	-2.38	.01	0.74

N = 42. Degrees of Freedom for the *t*-statistic = 40. *d* represents Cohen's *d.*

Research Question #5: Was there a statistically significant difference in study participant perceptions that healthcare providers should give nutritional advice to their patients by participant chronic health issue status?

The statistical significance of mean score difference in study participant perceptions that healthcare providers should give nutritional advice to their patients was addressed using the *t* test of Independent Means. As a result, the mean score difference of 0.52 favoring the perceptions of study participants with chronic health issues was statistically significant ($t_{(24.87)} = 2.38$; $p = .01$). The magnitude of effect for the difference in perceptions that healthcare providers should give nutritional advice to their patients was considered approximating a large effect large at $d = .78$. Table 10 contains a summary of findings for study participant perceptions that healthcare providers should give nutritional advice to their patients by chronic health issue status.

Table 10. Summary Table: Perceptions that Health Care Provider Should Give Nutritional Advice to Patients Comparison by Chronic Health Issues Status of Participants

	No Chronic Health Issues		Chronic Health Issues				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
Health Care Provider Providing Nutritional Advice	4.26	0.87	4.78	0.42	2.38	.01**	0.78

N = 42. Degrees of Freedom for the *t*-statistic = 24.87. *d* represents Cohen's *d.* $^{**}p \leq 01$

Research Question #6: Were study participant perceptions of making good nutrition an integral part of lifestyle predictive of perceptions of preference for prescription medications over changing diet?

The simple linear regression statistical technique was used to address the predictive nature of research question six. The predictive model used in research question six was statistically significant (F (1,40) = 6.12, p = .02, R^2 = .13), indicating that approximately 13.27% of the variance in perceptions of preference of prescription medications over diet change is explainable by perceptions of making good nutrition an integral part of lifestyle. Perceptions of making good nutrition an integral part of lifestyle was inversely statistically significantly predictive of preference of prescription medications over diet change (B = -0.75, $t_{(40)}$ = -2.47, p = .02), indicating that on average, a one-unit increase of perceptions of making good nutrition an integral part of lifestyle will decrease the value of perceptions of preference of prescription medications over diet change by 0.75 units. Table 11 contains a summary of findings for predicting perceptions of preference of prescription medications over diet change by perceptions of making good nutrition an integral part of lifestyle.

Table 11. Predicting Perceptions of Preference of Prescription Medications Over Diet Change by Perceptions of Making Good Nutrition an Integral Part of Lifestyle

Model	*B*	*SE*	95.00% CI	β	*t*	*p*
(Intercept)	5.93	1.43	[3.04, 8.82]	0.00	4.14	< .001
Good Nutrition	-0.75	0.30	[-1.36, -0.14]	-0.36	-2.47	.02*

*p < .05

Chapter V: Discussion

Descriptive Statistical Analysis Findings

Regarding the descriptive statistical analysis of the study's demographic identifying information, among 42 total participants surveyed, there was nearly an even split between adults who had experienced chronic illness and those who had not (23 chronic and 19 non-chronic), providing a helpful balance for comparison between these two populations. Regarding the demographic information evaluated, the majority of the population was female (76.19%), between the ages of 18-25 (78.57%), and white (64.29%), indicating that the results of this study are not representative of the general population. However, the study's sample did include at least one person from every age bracket and ethnic category. Typical frequency of medical office visitation ranged from only a few visits since the age of 18 to multiple times a week, with no typical visitation frequency being predominant, indicating that the population studied included many individuals with only minimal experience in the American healthcare system as well as many with extensive experience. None of the adults surveyed had typically visited healthcare providers more than once a month.

Among all 42 participants surveyed, 47.62% had never sought treatment for a chronic illness, while 26.19% had sought treatment for five years or less, and 9.52% (4 adults) had sought treatment for 11 years or more. These percentages indicate that the population of adults studied who had experienced a chronic illness included many with significant experience seeking treatment from one or more providers, as well as several with very extensive treatment experience who had been seeking treatment for their chronic illness(es) for over a decade. Participants collectively represented a medication status of 0-5 prescribed medications and only

one with more than five, indicating that results do not represent the experiences or perspectives of any individuals with excessively high medication profiles.

Finally, an acceptable to good level internal reliability was achieved in the study, indicating that it can be determined with confidence that survey question scores represent what they are intended and designed to represent.

Summative Experiences and Perspectives Analysis Findings

All but one participant had sought medical advice or treatment from a primary care provider (97.6%), while many had also consulted an urgent care clinician (59.5%), an emergency room clinician (45.2%), and/or a medical specialist (66.7%). At least one participant had consulted every type of medical specialist included in the survey except an alternative or functional medicine doctor, so this specialty is unfortunately not represented in the results.

Patients reported being prescribed medication more often than receiving nutritional recommendations for every type of healthcare provider and medical specialty represented in the study. Only two adults reported that they had never been prescribed medication by any healthcare provider they had seen since the age of 18, while six adults reported that they had never been given nutritional recommendations by any healthcare provider they had seen since the age of 18. Primary care providers were nearly just as likely to prescribe medication as they were to give nutritional recommendations, with nutritional recommendations being given only slightly less frequently. Larger discrepancies between prescription medications and nutritional recommendations were observed in urgent care clinicians, emergency room clinicians, and medical specialists. Urgent care clinicians almost always gave medication but only included nutritional recommendations 24% of the time. Emergency room clinicians were three times as

likely to prescribe medication than to provide nutritional recommendations. Medical specialists were more likely than urgent care clinicians and emergency room clinicians to provide nutritional recommendations, but less likely than primary care providers collectively.

Medical specialists from every specialty except hematology were reported to have prescribed medications; medical specialists who were reported to have provided nutritional recommendations included specialists from every specialty except hematology, podiatry, pulmonology, and radiology. The only specialties in which medication did not outweigh nutritional recommendations were pediatrics and cardiology. Among 24 patients who had consulted a pediatrician, equal numbers had received prescriptions as had received nutritional recommendations. Similarly, among eight patients who had consulted a cardiologist, three had been prescribed medication while four had received nutritional recommendations.

However, prescription of medication usually outweighed nutritional recommendations in frequency for most specialties, with the gap being much larger for some specialties than others. Dermatologists were three times as likely to include prescription medications in treatment than they were to provide nutritional recommendations. OB/GYNs prescribed medication more than twice as often as nutritional recommendations in treatment. Podiatrists, pulmonologists, and hematologists were never reported to have given nutritional recommendations (though only a handful specialists are represented in this statistic). Only one participant had received nutritional recommendations from a urologist, when 6 participants reportedly consulted one.

There were some statistical similarities and differences for treatments of chronic diseases when these were isolated from general health consultations. Chronic diseases which were included as an option in the survey but not experienced by any participants surveyed included in the population studied included Addison disease, atrial fibrillation, celiac disease, Crohn’s

disease, heart failure, hepatitis, hyperlipidemia, kidney disease, lung disease, multiple sclerosis, osteoporosis, or stroke. Therefore, these diseases are not represented in the results. For chronic patients as with the general population, frequency of medication prescription usually outweighed nutritional recommendations. Also similarly, pediatricians and cardiologists stood out as including both forms of treatment nearly equally frequently. Dermatologists were significantly more likely to include prescription medication than nutritional recommendations in treatment of chronic diseases as they were in general treatment. Only one OB/GYN out of 3 were reported to have given nutritional recommendations, and no pulmonologists out of 3 were reported to have given any. For other specialties, numbers were too small to make any meaningful comparison.

In the opinion section of the survey, statistics for the overall population studied reflected strong agreement on many topics. All participants agreed that "good nutrition is important for my health and wellness," with 19% agreeing and 81% strongly agreeing. This question reflected the strongest agreement of all Likert-scale type questions. Participants also unanimously reported that "I want to make good nutrition an integral part of my lifestyle for the long term," with 31% agreeing and 69% strongly agreeing. Participants then began to differ on how those beliefs are translated into their everyday lives. For instance, in response to the statement "I put forth effort to practice good nutrition in my everyday life," 21.4% were neutral and 16.7% admitted that they disagreed.

Although all participants desired to pursue a lifestyle of good eating habits, many appeared not to understand how to do so. The majority of participants reported that they understood how to incorporate good nutrition into their daily lifestyle in a way that worked for them and supported their long-term health, with only 23.8% not agreeing. However, participants were somewhat less likely to agree that their healthcare provider had helped with building this

understanding. Nine study participants agreed or strongly disagreed (21.4%), and 15 had a neutral stance (35.7%). However, participants in agreement outweighed those in disagreement, indicating that more people perceived that their healthcare provider had played a role in their pursuit of building a sustainable healthy diet than those who did not.

All study participants welcomed nutritional recommendations from their healthcare provider(s), with only three people indicating uncertainty (neutral; 7.1%) and everyone else in agreement or strong agreement (92.9%) with the statement. This did not necessarily indicate that everyone perceived that healthcare providers should provide nutritional advice to their patients as a general norm, as one study participant disagreed with the statement. However, nearly all study participants agreed that healthcare providers should offer nutritional advice to their patients (92.9%) with most people strongly agreeing with the statement (64.3%). There was no disagreement with the statement that "I would do my best to implement any nutritional recommendations from my healthcare provider(s)," with half of study participants strongly agreeing with the statement.

One Likert-scale type personal stance question involved selecting a preference between prescription medication and nutritional recommendations, to compare what patients generally prefer in healthcare treatment to what they actually received from their healthcare providers. The statement was, "When it comes to managing health conditions, I would prefer prescription medications over changing my diet." Seven study participants agreed (16.7%), 10 were neutral (23.8%), 18 disagreed (42.9%), and seven strongly disagreed (16.7%) with the statement. Disagreement thus outweighed agreement with the statement, but those with an agreeing or neutral stance affirm the reality that there are often many variables concerning management of health conditions. In essence, people may agree that nutrition is important for their health, desire

to make it a part of their lifestyle, desire nutritional advice from their healthcare provider(s), and desire to implement that nutritional advice, but may still prefer prescription medications over changing their diet. This preference could be due to a belief that a certain health condition is best treated by a certain medication, a belief that medications are easier to incorporate into one's daily life than a diet change, or a variety of other factors.

Study participants also responded to two Likert-scale type questions which evaluated their perceptions of the extent to which good nutrition is useful to individuals suffering from chronic health conditions. No one disagreed that good nutrition can help improve chronic health conditions, indicating that almost all study participants perceived that diet could fulfill a role in managing chronic disease symptoms with nearly half of study participants indicating strong agreement with the statement. However, there was more perceived disagreement regarding whether nutrition can really reverse chronic health conditions. Most study participants agreed or strongly agreed with the statement, a point well-supported in the professional literature on the topic on nutrition's ability to reverse chronic health conditions.

Finally, study participant responses to personal stance short-answer questions were interesting and revealing. Most people reported that they do not believe the current prevalence of nutritional interventions in healthcare is satisfactory, justifying their stance by indicating that nutrition is more often neglected in clinical settings than not, and nutritional advice is not always provided in a comprehensive way that effectively translates to realistic application. Five study participants responded in affirmation of the notion that nutritional interventions have been very prevalent based on their experience, but they represented the minority within the sample of participants with this response. A significant proportion of respondents expressed frustration with insufficient time during healthcare visits for providers to educate their patients and discuss

nutrition thoroughly enough, as well as frustration with medications being prescribed too quickly and too often, accommodated by occasion, facts strongly supported in the professional literature. One study participant noted that resolving their high blood pressure was accomplished by “fixing my diet” without need of the medication a doctor offered.

When asked whether they had seen the role of nutrition in healthcare change over the years, many study participants reported that they had experienced minor improvement in recent years, perceiving an increase in the importance placed on nutrition in society, which is perhaps explained by a sense of urgency caused by rising obesity rates and by new studies being conducted on the matter. Study participants also noted that many new diets have become popular in the culture with healthier options being offered in grocery stores. However, some also perceived no change or slight decline regarding the matter.

Perhaps most interestingly was the finding that almost all study participants who responded to the question, “Do you believe the role of nutrition in healthcare should change in the years to come? Why or why not?” answered in the affirmative. Study participants followed up with suggestions such as making preventative medicine more of a priority, making healthy foods more of a priority and more accessible, prescribing diets just like medications, and overall integrating nutrition into healthcare more.

In the third and final stage of data analysis, the most relevant of these personal stance questions were analyzed statistically, with differences between the responses of study participants identified as experiencing chronic health conditions and study participants identified as not experiencing chronic conditions were also investigated through the proposed research questions, as provided below.

Descriptive and Inferential Statistical Analysis by Research Question Findings

The findings achieved through this study's six research questions summarize six key implications of this research about the similarities and differences between chronic and non-chronic patients regarding perspectives about nutrition in healthcare. The first research question was focused upon participant perceptions of good nutrition as important for health and wellness. As a result, it was found that the mean score response for perceptions of good nutrition as important for health and wellness was statistically significant, with a huge magnitude of effect for study participant response. As such, it may be concluded that the population represented in this study expressed no reservations about nutrition being important for health, and no other findings contradicted this conclusion.

The second research question was focused upon participant perceptions of making good nutrition an integral part of lifestyle for the long term, particularly regarding participant chronic health status. There was a statistically significant mean score difference between responses of those with chronic health issues and those without, with an effect of difference in perceptions between medium and large. Study participants experiencing chronic health conditions were in even stronger agreement than non-chronically ill patients that making good nutrition an integral part of one's lifestyle is desirable. Thus, although all study participants indicated that they wanted to make good nutrition an integral part of their lifestyle for the long term, study participants experiencing chronic health illness perceived that to a greater degree. The finding is perhaps the result of a greater sense of urgency to take care of their health because of their diagnoses with study participants experiencing chronic health conditions.

The third research question was focused upon an evaluation of participant perceptions of understanding how to incorporate good nutrition into daily lifestyle in a way that works and

supports long-term health, also according to chronic health issue status. The mean score difference favoring the perceptions of study participants with chronic health issues was also statistically significant, with an effect in the difference considered to be between medium and large, indicating that patients experiencing chronic pain were also collectively more likely than non-chronic patients to have a strong understanding of how eat well in their daily lives. This difference may corroborate the implications of the second research question that chronic patients are more likely to act in instituting a healthy diet.

In the fourth research question, study participant perceptions of welcoming nutritional advice and recommendations from healthcare provider(s) was evaluated. Similar to the findings achieved in the second and third research questions of the study, a statistically significant mean score difference with a large effect indicated that study participants experiencing chronic health issues agreed to a noteworthy degree more than study participants not experiencing chronic health issues that they would welcome nutritional interventions from their healthcare providers. This finding may suggest that individuals experiencing chronic health issues are particularly eager to receive counsel and guidance from their healthcare providers about managing their condition through the element of diet.

The fifth research question was focused upon an evaluation of study participant perceptions of healthcare providers offering nutritional advice to their patients. The mean score difference favoring the perceptions of study participants with chronic health issues was statistically significant with a large effect, indicating that study participants experiencing chronic health issues were completely supportive of healthcare providers including nutritional interventions and treatment. Furthermore, their support of the notion was significantly greater when compared to study participants not experiencing chronic health issues. This finding is

congruent with the findings of every other research question stated in the study and could be interpreted to suggest that individuals experiencing chronic health issues may be seeking out nutritional interventions from healthcare providers more than their peers who are not experiencing chronic health issues in the general population.

The sixth and final research question was focused upon an evaluation of participant perceptions of making good nutrition an integral part of lifestyle, compared with preference for prescription medications over diet changes. This research question was unique in that it was designed to evaluate the predictive relationship between perceived importance of making good nutrition a lifestyle and preference for medication versus nutrition in healthcare treatment. As a result, there was an inverse statistically significant predictive relationship between perceptions of making good nutrition a lifestyle of preference of prescription medications over diet change, indicating that those who expressed agreement with the importance of making nutrition a lifestyle were very likely to *not* prefer prescription medications over diet change. Because structuring this preference question of the survey to suggest nutrition over medication may have been somewhat leading after answering previous questions about the importance of nutrition, preference for medication over nutrition was the focus instead. Therefore, the results achieved in this survey item and the relationship identified in research question six are perhaps all the more supportive of the true stance of study participants surveyed in the study. In essence, those who affirm the importance of making good nutrition an integral part of their lifestyle are indeed likely to prefer nutritional interventions in their healthcare treatment over medications, indicating that other factors such as the relative ease of being prescribed medication are less likely to conflict with that preference, regardless of chronic health issue status.

Chapter VI: Conclusions

Interpretations and Key Takeaways

The study was designed to address the question of how prevalent nutritional interventions currently are in the American healthcare system according to adult patients. Moreover, central to the study was the degree to which study participants would perceive issues related to nutrition in healthcare as important and the degree of difference in perception by study participant chronic disease status. Considering the quantitative and qualitative findings achieved in the study, nutritional interventions exert a significant presence in the healthcare system in general. However, it is not nearly as prevalent as prior research on the topic suggests it should be, nor as prevalent as respondents perceived it should be. Pharmaceuticals represent an incredible discovery of the last century that have brought healing and improved wellness to countless lives. However, if nutrition is perceived to be the key indicator of optimal health, then it would appear intuitive to recognize the importance of its role in the health industry. A growing community of clinicians encourage this approach, and the population surveyed in the current study collectively appear to validate and encourage it as well.

The essential findings achieved in the study by research question stated may be summed up as follows: 1) study participants perceived good nutrition as important to their health and wellness to a maximal degree; 2) there was a statistically significant difference in study participant perceptions of making good nutrition an integral part of lifestyle for the long term by participant chronic health issue status; 3) there was a statistically significant difference in study participant perceptions of understanding how to incorporate good nutrition into daily lifestyle in a way that works and supports long-term health by participant chronic health issue status; 4) there was a statistically significant difference in study participant perceptions of welcoming

nutritional advice and recommendations from healthcare providers by participant chronic health issue status; 5) there was a statistically significant difference in study participant perceptions that healthcare providers should give nutritional advice to their patients by participant chronic health issue status; and 6) study participant perceptions of making good nutrition an integral part of lifestyle was inversely statistically significantly predictive of perceptions of preference for prescription medications over changing diet. Together, these findings appear both intuitive and conclusive. Unsurprisingly, participants unanimously expressed belief in the importance of good nutrition for health. More surprisingly, however, participants *with* chronic health conditions were in even stronger agreement in valuing nutrition than study participants who had not experienced chronic health issues. The perceptions of study participants experiencing chronic health issues were consistently to a greater degree in affirming the importance of making good nutrition a lifestyle, feeling they understood how to do so, and desiring that nutritional advice be given in the healthcare setting than their peers who identified as not experiencing chronic health issues. As such, a second key takeaway from the findings achieved in the current study lies in the notion that experiencing chronic health issues appears to prioritize the role of diet and nutrition, and in doing so, tend to seek nutritional interventions for their health conditions over preference for medications.

Strengths, Limitations, and Future Studies

This study had many strengths, the first strength being its relevance to cutting-edge research on the topic of focus. Western healthcare has been working toward improvement in many ways ever since its formally recognized inception hundreds of years ago, but within just the last several decades, the effects of nutrition upon overall health have started gaining

prominence. Studies designed to investigate the many diverse avenues of nutrition science have been abounding increasingly since the turn of the 21st century, providing an accumulation of evidence to the scientific literature in support of the notion that nutrition has the power to influence every aspect of human health, and therefore fulfilling of an important role in human healthcare. By addressing the presence of nutritional interventions in healthcare, the findings achieved in the study would appear to address an existing gap in the relevant professional literature on the topic by contributing to an updated understanding of the status of nutrition as a component of healthcare.

Additionally, the use of the study's survey provided a platform for study participants to voice their perceptions of important issues associated with the American healthcare system. These factors are necessary in the conversation about healthcare as they contribute to a better understanding of how it can improve.

A strength as well as a weakness was the study's sample size of participants. The total of 42 study participants was robust in providing sufficient statistical power in addressing the analyses associated with the six research questions, but was limiting for generalization purposes. The study's sample also reflected substantial demographic imbalances which necessarily and significantly limited the generalizability of the results. Thirdly, the locations of participants throughout the United States were not recorded in the survey, although participants were likely more concentrated in the southeast, as this is where the study was primarily advertised. For that reason, there may have been regional differences in responses that went unnoticed. Fourthly, due to the limited sample size accessed for study purposes, many chronic illnesses were not represented in sufficient numbers as to allow meaningful analyses to be conducted by study participant specific chronic illness. Examples of such chronic diseases include acne vulgaris

(which was not included as an option in this survey's chronic disease questions), heart failure, and stroke. For these reasons, the results of this research cannot be generalized to represent the general population of chronic or non-chronic patients in the United States. The study's findings are therefore to be interpreted simply as a summary of the perceptions of a small group of adult patients, intended only to provide a starting point for the conversation on perceptions of nutrition in healthcare. Future research should expand the sample size and control for differences in gender, age range, ethnicity, and geographical location comparatively. It should also ensure inclusion of more adults who have sought treatment for chronic diseases, especially those that research indicates may be treatable by nutritional interventions, to demonstrate whether such knowledge is being applied to chronic disease cases.

Another data point that similar future studies could include would be consultations of alternative or functional medicine doctors compared with other types of healthcare providers and medical specialties. Functional medicine doctors identify as specialists in preventative care and addressing root causes of diseases, prioritizing lifestyle factors such as diet and physical activity.[75] Therefore, data from these clinicians would be insightful in creating a more comprehensive picture of how specific treatments in the healthcare system are appropriated according to the type of clinician consulted and the form of care provided.

Participation in the study was voluntary with no compensation, creating a likelihood that many participants were motivated to engage the survey due to a preexisting interest in the topic and perhaps a strong preexisting bias. Therefore, responses may have been skewed toward the extremes of various measures beyond what can be clearly ascertained. This possible skewing may perhaps constitute another reason why the study's findings cannot be understood to

represent the general population and call for further research surveying a more representative sample.

Finally, and most importantly, the findings achieved in the current study may provide the impetus for conducting similar studies investigating the experiences and perspectives of clinicians working in the American healthcare system. The current study was designed to portray one element of the healthcare dynamic and does not include insights from healthcare providers, which would prove extremely valuable in identifying the reasons behind the prevalence of treatment with medication versus with nutritional interventions. Healthcare providers and medical specialists could be asked about the education and training they've received for incorporating nutritional interventions into treatment, their professional opinions on the extent to which nutrition can play a role in modern doctor's offices, challenges and limitations they may experience due to various accountabilities, and even other factors that outsiders critiquing the system don't know that they don't know.

To improve upon the design of this study, more robust results might be produced by using more concrete and verifiable data than survey responses. Many discrepancies in participant responses were clear upon initial analysis, revealing some inconsistencies in the survey structure and some details not explained clearly enough to ensure descriptive data. Although these discrepancies were controlled and accounted for in the presentation of the results, they could be avoided altogether with a reformed study design utilizing other research methods and instruments, such as chart notes collected from medical records or interviews in which any uncertainties from study participants can be clarified.

The Call for Healthcare Reform

The primary relevance of this study would appear to be its contribution to American healthcare reform. Based on current medical perspectives and systems, a few considerations are noted to clarify how the American healthcare system can move forward from where it stands today. An imperative step in reforming healthcare in accordance with the advancement of nutrition science begins with educating the next generation of physicians. The problem is not always physicians' lack of interest in counseling their patients on the importance of nutrition. In a 2012 survey, primary care physicians expressed support for increased training for better care of obese patients.[76] In 2018, two articles related to nutrition issues were the most read articles in the major medical journal *JAMA Internal Medicine.*[76] Rather than a lack of interest amongst physicians, perhaps of greater concern is the lack of emphasis upon nutrition in medical school curricula. Thus, instituting policies regulating nutrition education in medical schools is a plausible first step towards closing the gap between physicians' desire to implement nutritional interventions and their ability to do so. Of the few medical schools in the aforementioned survey which did provide at least the minimum recommended 25 hours of nutrition education, most were able to do so by incorporating nutrition content not in a single course but across the learning continuum.[67] Thus, including nutrition education throughout the years of academic and clinical training of medical students, and enforcing this minimum requirement through established regulations, can move the U.S. medical education system in the desired direction. It may greatly improve the possibility that patients seeking preventative measures or suffering from common chronic illnesses will receive more of the effective counseling and treatment that research has supported.

In addition to increasing medical education, it has been suggested that nutrition constitute a portion of the continuing medical education (CME) hours required of U.S. physicians.[76] It may also prove greatly beneficial to consult registered dieticians as vital members of the healthcare team, especially for cases in which nutritional interventions are evidenced by research to be promising.[76] Ultimately, meaningful and successful change in the nutritional quality and overall health of American patients requires a comprehensive and practical approach in which governments, communities, companies, and healthcare providers work together in partnership.[77] Many primary care professionals are interested in complementary and alternative methods such as nutrition, but steps must be taken to increase regulations and establish effective new initiatives in healthcare settings.[78]

Overall, the progress that healthcare has made through the centuries since its humble beginnings is astounding. As healthcare professionals, administrators, and researchers work together to overcome new challenges, uphold sound medical ethics, research best interventional strategies, honor a patient-centered care model, and continue putting forth the best possible team effort to understand and heal, there is tremendous hope that America will soon discover an unprecedented caliber of health, wellness, and prosperity as a nation. Through these collective efforts in the years to come, nutritional interventions may well become far more prevalent.

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