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Healthcare Assessment Algorithms/Guides in Pandemic Eras: Capturing Critical Data (Aged 65 and older)

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HEALTHCARE ASSESSMENT ALGORITHMS/GUIDES IN PANDEMIC ERAS: CAPTURING CRITICAL DATA (AGED 65 AND OLDER)

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ABSTRACT

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The COVID-19 pandemic brought about many concerns for populations across the globe in terms of health and well-being including in the United States. It changed the way patients interact within society and limited access to resources that were once readily available. The American population had to adjust the way they go about what used to be considered normal and address challenges in a new era. Fear of the unknown and the mandated lockdowns in an attempt to stop the spread of the coronavirus (COVID-19) prevented normal standard healthcare visits for the population. Many patient interviews in primary care are being accomplished over the phone or through virtual online assessments, which limit the providers' ability to get to the root of issues patients might be facing. Additionally, the older population (aged 65 years and older) might not be as versed in the technological methods utilized for communicating their healthcare needs, be it access to the resource or understanding how the system itself works. Many questionnaires are available to elicit direct answers in terms of identifying barriers and addressing optimal health in lockdown but very few practice algorithms are available to help providers navigate this complex and changing clinical situation.

Critical questions are used to identify problem areas and help in understanding coping abilities used by the population in this new environment but what happens when the patients' answers prompt further investigation or referral? The ability to provide alternative options for the older adult population, to ensure progress on the continuum of health in an era where community

resources are affected by pandemic restrictions, is essential for optimization of care. The purpose of this Doctor of Nursing Practice scholarly research project was to develop and validate a standardized algorithm/guide to address and overcome the barriers faced by the population aged 65 years and older, particularly in the realm of mental health, nutrition, and physical activity to facilitate optimal patient care in pandemic environments such as those created by COVID-19 now and in the future. Review and validation by the multidisciplinary panel of experts reported the algorithms/guides were in-line with current evidence-based practice guidelines and directly relevant to the clinical practice setting.

Keywords: pandemic, coronavirus, SARS-CoV-2, COVID-19, epidemic, screening, guideline, medical algorithm, nutrition, physical activity, and mental health

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Disclaimer Clause**:** The views expressed in this paper are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the U.S. Government.

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CHAPTER I

INTRODUCTION

Central Theme/Background

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the strain of coronavirus that causes coronavirus disease 2019 (COVID-19), has resulted in significant clinical and economic consequences for medical practices of all specialties across the nation (Provenzano et al., 2020, p. 579; Smith et al., 2020). Known consequences to the restrictions placed on the population related to the pandemic, while meant to stop or slow a deadly disease, have increased anxiety, depression, and negatively impacted established social support networks of the older adult population (Van Jaarsveld, 2020). Remaining healthy in a lockdown environment might not only strain the patient and provider relationship in terms of healthcare accessibility but could also magnify a multitude of problems plaguing a population cohort, particularly those with pre-existing conditions and non-communicable diseases. Mental health, nutrition, and physical activity are some of the key components that affect all other body systems in any given timeframe and in any environment. This coupled with the comorbid conditions of hypertension, cardiovascular disease, diabetes, obesity, and respiratory disease have enabled COVID-19 to have a greater overall negative impact on the older population (Flaherty et al., 2020).

Statement of the Problem

A collaborative guide to interview patients in a primary care setting could not be located when society was placed in lockdown by the government in an attempt to curb the transmission

of disease. This left many providers with limited options for following up on problems earlier identified and restricted the ability to go in-depth and reveal barriers that might cause further harm to the patient if unassessed. Additionally, there was the potential to miss a diagnosis when unable to do an in-person physical exam (Kendrick, 2020).

Purpose of the Project

The purpose of this Doctor of Nursing Practice (DNP) scholarly project was to develop and validate standardized algorithms/guides to address and overcome the barriers faced by the older adult population (aged 65 years and older) in the realm of mental health, nutrition, and physical activity in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19. The intent was to create holistic algorithms/guides as a reference for advanced practice providers in primary care settings to improve care to this specific population under restricted pandemic conditions.

Need for the Project

The uncertainty in medical practice felt by many advanced practice providers who provide care to older adults throughout the healthcare system is caused by inter-related factors. Of great concern, the "American Centers for Disease Control and Prevention (CDC) list the age over 65 years as a risk factor for the severe course of COVID-19, which is associated with an increase in hospitalization and significantly increased mortality" (Luc et al., 2020, p. 422). Uncertainty in the healthcare system response to COVID-19 and the varied levels of care required might contribute to advanced practice providers feeling they have provided inadequate care as they work to navigate through the pandemic. If providers were not embracing telemedicine previously, many were instantly forced to adapt to the process along with their patients. "During the first quarter of 2020, the number of telehealth visits increased by 50%,

compared with the same period in 2019" (Koonin et al., 2020, p. 1595). However, there were concerns about when telemedicine is not appropriate or might not work for a specific patient population cohort, particularly those who might not have the economic means or skill-set to access technology.

> Thirteen million older adults may have trouble accessing telemedicine services, although older adults are willing and able to learn to use telemedicine, an equitable health system should recognize for some, such as those with dementia and social isolation, in-person visits are already difficult and telemedicine may be impossible. (Lam et al., 2020, p.1389-1390)

Thus, a modified approach to primary care is called for, especially in the care of older adults.

No concise collaborative effort, interactive algorithm/guide could be found for care of the older adult in primary care despite the development of specialty algorithms for other areas of medicine. This lack of a consistent guide has the potential to lead to missed barriers impacting health and well-being in lockdown. Standardizing protocols, algorithms, and frameworks into an evidence-based triage auto questionnaire would be helpful to many providers who might be individually creating their own questionnaires. This would also alleviate duplicative efforts and variance in protocols, algorithms, and frameworks currently in use (Ohannessian et al., 2020).

The population aged 65 and older is at risk for having barriers missed that impact health during interviews with advanced practice providers due to the lack of a standardized interactive algorithm/guide for primary care. The older population is more likely to have comorbid conditions of hypertension, cardiovascular disease, diabetes, obesity, and respiratory disease, which puts them at increased risk of serious complications including death from COVID-19 (Flaherty et al., 2020). Difficulties associated with access to telemedicine and pre-existing

conditions such as dementia make telemedicine difficult at best (Lam et al., 2020). The goal of this project was to develop consolidated, collaborative, interactive, comprehensive algorithms/guides to capture critical items in terms of mental health, nutrition, and physical activity in the primary care setting for older adults. The outcome would be to improve capture of barriers to health and address health concerns for those aged 65 and older when faced with lockdown during a pandemic.

The highly contagious disease of COVID-19 combined with an elderly population with pre-existing comorbid conditions influenced by mental health, nutrition, and physical activity during an environmental lockdown has enabled a perfect storm. Critical questions are needed to identify problem areas and help in understanding coping abilities used by the population in this new environment, but what happens when the patients' answers require further investigation or referral? The ability to provide alternative options for the older adult population to ensure progress on the continuum of health in an era where community resources are affected by pandemic restrictions is essential for optimization of care.

Research Question

The following research question guided this study:

Q1 What focus points in terms of mental health, nutrition, and physical activity are important to factor into standardized algorithms/guides to address barriers in the older adult population during a pandemic lockdown?

Objectives of the Project

This project had two phases composed of the following objectives:

1. Phase I: Use the current evidence to create algorithms/guides for primary care providers that employ a holistic approach during care for the older adult patient population during a pandemic.

2. Phase II: Confirm the relevancy and usability of the proposed algorithms/guides with a panel of expert clinicians with the intention of implementing the tool at a later date in the primary care setting.

Definition of Terms

Algorithm. Set of rules or ordered set of instructions to solve a problem.

Coronavirus. Any of various RNA-containing spherical viruses of the family Coronaviridae including several that cause acute respiratory illnesses.

Coronavirus disease 2019 (COVID-19). A potentially severe, primarily respiratory illness caused by coronavirus and characterized by fever, coughing, and shortness of breath. In some people, the disease also damages major organs such as the heart or kidneys.

Diet. Food and drink considered in terms of its qualities, composition, and its effects on health.

Epidemic. Extremely prevalent, widespread disease affecting many persons at the same time, and spreading from person to person in a locality where the disease is not permanently prevalent.

Guide. Indication of a future course of action.

Healthcare Delivery Intervention. The algorithms/guides developed in this project.

Medical algorithm. Method for solving a problem or achieving a specific goal.

Mental health. Psychological well-being and satisfactory adjustment to society and to the ordinary demands of life.

Nutrition. The act or process of nourishing or of being nourished. The process by which organisms take in and utilize food material. Nutriment.

Pandemic. A disease prevalent throughout an entire country, continent, or the whole world.

Physical activity. Refers to all movement including during leisure time, for transport to get to and from places, or as part of a person's work. Both moderate and vigorous intensity physical activity improve health.

Screening. The act or work of a person who screens as in ascertaining the character and competence of applicants, employees, etc. Undesirable material that has been separated from usable material by means of a screen.

Severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2). The strain of a coronavirus that causes COVID-19. First identified in 2019, it subsequently set off a global pandemic.

Summary

The COVID-19 pandemic created barriers in health care and the environmental lockdown led to challenges in follow-up care. The highly contagious disease of COVID-19 combined with an elderly population with pre-existing comorbid conditions influenced by mental health, nutrition, and physical activity during an environmental lockdown has enabled a perfect storm. No concise collaborative effort, interactive algorithm/guide could be found for care of the older adult in primary care despite the development of specialty algorithms for other areas of medicine. Therefore, the purpose of this DNP scholarly project was to create and validate algorithms/guides that would improve capture of barriers to health and address health concerns for those aged 65 and older when faced with lockdown during a pandemic.

CHAPTER II

REVIEW OF THE LITERATURE

In this chapter, the literature review is synthesized to frame the historical background behind the disease process, the medical environment changes to telemedicine, and highlight gaps identified leading to potential care barriers. This rapidly evolving situation has been wrought with much uncertainty amongst advanced practice providers and the older adult population as they learn to navigate a new healthcare environment unlike anything they have experienced before in primary care. The Stetler (2001) theoretical model is also discussed as it underpinned this scholarly project in terms of development of an algorithm/guide for primary care providers applying a holistic approach in the care of the older adult patient population within the context of a pandemic.

Purpose of the Project

The purpose of this Doctor of Nursing Practice (DNP) scholarly project was to develop and validate standardized algorithms/guides to address and overcome the barriers faced by the older adult population (aged 65 years and older) in the realm of mental health, nutrition, and physical activity in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19. The intent was to create holistic algorithms/guides as a reference for advanced practice providers in primary care settings to improve care to this specific population under restricted pandemic conditions.

Historical Background

The World Health Organization (WHO) declared the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the strain of coronavirus that causes coronavirus disease 2019 (COVID-19), a public health emergency of international concern in January 2020 and a pandemic by March 2020 (Smith et al., 2020). Since spreading rapidly around the globe, the uncertainty regarding COVID-19 and the navigation changes to the medical environment have presented challenges of both clinical and economic consequences for advanced practice providers in all specialties across the nation (Provenzano et al., 2020). The most pressing challenge raised by the coronavirus disease pandemic relates to the best way to care for the enormous number of patients becoming critically unwell simultaneously and resource allocations (Salvulescu et al., 2020).

The level of immediate concern that ran through the medical community was magnified by the unknowns and quality of information or misinformation presented to the population in public and private forums (Pennycook et al., 2020). A global perspective was witnessed as each country attempted to fight a pandemic that did not discriminate against the world population. The medical community was already dealing with scarce resources prior to the pandemic and then had to expend additional resources to maintain the health of the population (Emanuel et al., 2020). The emotional aspect of the coronavirus, along with social isolation and changes in care modalities from in-person clinic visits to telemedicine, has taken its toll on both patients and providers. There have been concerns about frontline workers in terms of resiliency, mental health, and how they can continue to sustain the surge pace in the setting of emotional trauma related to high death tolls (Santarone et al., 2020). Identified weak points exist in current systems related to telemedicine and outreach such as lack of diagnostic tests. Advanced practice

providers must work to sustain an environment that enables them to optimize care modalities for patients in any environment to meet the needs of that population.

Unlike the recent coronavirus pandemic, algorithms have an extensive history. The first-known written algorithms occurred in 2000 BC in Mesopotamia and growing experience surrounding clinical algorithms suggested the benefits outweighed the risks in medicine (Bruderer, 2018; Komaroff, 1982).

> Over the past 30 years, there have been increasing attempts to transform the "art" of medical decision-making into a "science," to supplement a spontaneous, informal, and implicit set of judgments with the conclusions of a predetermined, formal, and explicit scheme of logic. Algorithms have been developed for the care of patients with acute minor illnesses, chronic disease, acute medical emergencies, and minor surgical problems, as disease in the worksite. (Komaroff, 1982, p. 10)

Clinical algorithms have a significant impact on healthcare delivery and research (Greenfield, 1978). General health questionnaires (GHQ) have been around for many years. The modified 28-item GHQ by Goldberg and Hillier (1979) focused on present and recent complaints that affect the overall health and well-being of patients. The construct of an algorithm seeks to find a balance in terms of meeting standard situations, encompassing common exceptions, and allowing for deviations from the norm (Feinstein, 1974). This has become increasingly complex in the abnormal environment of a healthcare pandemic. Research on COVID-19 is ongoing and the changing variants associated with this pandemic have no doubt influenced clinical decision-making and guidance in real-time. It has been difficult to find best practices from which to develop and adapt current algorithms into ones that could be easily applied in this unusual and challenging pandemic setting. Confusion and misinformation might cause variance in what the

best treatment modality is while keeping in mind that treatments are tailored to individual needs in light of the presence of other ongoing issues. An algorithm could help "reduce variation in how care is delivered and can improve the teamwork needed to provide high-quality health care, which also results in better patient outcomes" (Smith et al., 2020, p. 2).

Synthesis of the Literature

Methodology

A literature search on healthcare algorithms amidst pandemic eras was completed using the following databases: PubMed (Medline), Cumulative Index of Nursing and Allied Health Literature (CINAHL), Cochrane Database of Systematic Reviews, PsychInfo, and Google Scholar. A recent search within the last year included the following search terms: pandemic, coronavirus, SARS-CoV-2, COVID-19, epidemic, screening, guideline, medical algorithm, nutrition, physical activity, and mental health. References within eligible articles were also screened for additional sources. The Boolean operator "AND" was used to combine search terms. Results of the search query were further refined to full-text scholarly journal articles, peer reviewed, age category (65+ years), and primary language English. Titles and abstracts were reviewed to determine relevance including exclusion of studies not related to coronavirus pandemic, exclusion of articles exclusively focused on a specialty (i.e., rheumatology, transplant, etc.), and age parameters < 65 years. In total, 21 articles were selected for inclusion, deemed relevant to the evidence-based practice question, and compiled for analysis and synthesis (see Appendix A).

Synthesis

The following synthesis of the literature expanded on the rationale for algorithms/guides and the benefits of their use in the primary care setting. Algorithms are clinically useful to

providers because patient self-reporting is at risk of being subjective and might not always tell the whole story. Several questionnaires utilize a self-report model such as the 30-item GHQ and various National Institutes of Health questionnaires that focus on the detrimental impact the COVID-19 pandemic has had on the population. A few questionnaires from the National Institutes of Health (NIH, 2021) proved to be beneficial to aid this project of a collaborative algorithm/guide development included Physiological Stress Associated with the COVID-19 crisis, COVID-19 Impact on Health & Well-Being, COVID-19 Exposure & Family Impact Survey, and the Coronavirus Health Impact Survey.

Several variables were involved in why providers would be concerned about the health of the older adult population in general and even more so during a pandemic or epidemic. These could include malnutrition, physical fitness, social distancing impacts associated with loneliness, alternative methods of coping in less than desirable formats such as alcoholism, psychological distress, end-of-life concerns, resilience, mental health, and financial issues (Bedock et al., 2020; Formisano et al., 2020; Gorenko et al., 2021; Luc et al., 2020; Maugeri & Musumci, 2021; Miele et al., 2020; Noone et al., 2020; Wilke et al., 2021). Advancement in technology and transitions to virtual medicine have created gaps for those less technologically inclined. While some algorithms have been developed to better direct care, gaps remain in the system as a whole. Concerns associated with social isolation, physical/mental well-being, and nutrition in the face of disease management in a pandemic environment have led to greater use of telemedicine and the need for algorithms to guide these virtual interactions between patient and provider (Koffman et al., 2020; Koonin et al., 2020; Lam et al., 2020; Ohannessian et al., 2020).

Mental Health

The isolation from lack of in-person human interaction during the lockdown in an attempt to stop the transmission of COVID-19 exacerbated existing levels of anxiety, depression, and loneliness for many people (Luc et al., 2020). Lack of socialization amongst peer groups and colleagues due to the pandemic lockdown have had a significant psychological impact on older adults. Boredom, frustration, sense of isolation, financial difficulties, and overall socioeconomic distress have led to an increase in non-effective coping mechanisms such as alcoholism and a rise in domestic violence (Boschuetz et al., 2020; Luc et al., 2020; Noone et al., 2020).

According to Gorenko et al. (2021),

> The COVID-19 pandemic poses direct (e.g., worry) and indirect (e.g., isolation) risks for adverse psychological outcomes. Among older adults, social isolation and loneliness are associated with increased reactivity to stressors, anxiety, depression, cognitive decline, negative health outcome, and mortality risk. (p. 4)

While there are advantages to advancements in technology, they are not always easily welcomed or able to replace previous communication methods with more human connection. Technology can be beneficial but the focus must be on the patient's ability to learn the new technology, comfort with the online privacy component, and socioeconomic status as even the most basic platforms are not accessible for all. Poor mental and physical health in older people is often linked with loneliness and social isolation (Noone et al., 2020). Limited research is available to determine the effectiveness of video calls on the levels of isolation and loneliness older adults feel, which makes it difficult to assess for effectiveness.

Mental health is an ongoing concern for older adults and their families. The impacts are being felt by older adults at all levels including both within and outside of the healthcare

environment. Dementia affects 6.2 million Americans over the age of 65 with 72% being over the age of 75 (Alzheimer's Association, 2021). "People living with dementia, who have little knowledge and skills in the field of telecommunications and rely primarily on personal support, may feel a deepening feeling of loneliness and a sense of abandonment" (Luc et al., 2020, p. 422). Additionally, when focusing on the significant impact mental health, nutrition, and physical activity have in combination with comorbid conditions, there are long-term consequences when any one of the three does not align. Decreased physical activity has been linked to impaired mental health and well-being. The susceptibility for acquiring viral infections and non-communicable disease is also increased on the risk factor scale with a decline in physical activity (Wilke et al., 2021). Further demonstrating the connection between physical activity and mental health, "a study performed on older adults showed that those who met the global recommendations on physical activeness had higher levels of resilience and lower levels of depressive symptoms" (Maugeri & Musumci, 2021, p. 13).

The older adult population is at risk for decreased physical activity, lending to lower levels of resilience and higher levels of depression, making it difficult to be resilient. Death and dying have taken on a new context in the realm of COVID-19. The final moments of the patient if unable to be shared via technology with the family are often left to the healthcare workers who remain by their sides. The loss of human touch is critical in not only our day-to-day lives but in the final moments everyone in the population will one day face. The "safety precautions implemented for COVID-19 have created unique barriers to assessing and treating symptoms in this patient population at the end of life and changes made within our system to overcome these barriers" (Pahuja & Wojcikewych, 2021, p. 302).

Nutrition

Nutrition significantly impacts overall health and is essential to avoid a worsening prognosis in both critically and non-critically ill patients (Formisano et al., 2020). The elderly are often in the category of poor nutritional status as malnourishment impacts healing and could increase long-term hospitalizations. “Nutritional knowledge in patients with SARS-Cov2 infection (COVID-19) is limited and poor nutritional status is an established risk factor for community-acquired pneumonia” and “viral pneumonia since the times of the 1918 influenza pandemic” (Bedock et al., 2020, pp. 214-216).

Poor nutritional status could be caused by a number of factors such as poor health choices, lack of resources to obtain quality foods, and illness or disease-related lack of appetite. Nutrition becomes a double burden when both undernutrition and malnutrition promote severity of disease (Barazzoni et al., 2020). During the COVID-19 lockdown, many older adults struggled with the ability to obtain groceries, choosing social isolation and safety over the risk of becoming infected with the coronavirus. This does not discount the obvious that undernutrition and malnutrition would remain problems at baseline for the older adult patient population even when not placed in lockdown. The rise of the senior level population within the United States is estimated to be 104 million by 2050 and the number of older adults experiencing food insecurity is expected to increase over time (Terrell, 2019). Older adults (aged 65 and older) are prone to nutritional deficiencies and poor nutritional status lends to increased risk of communicable diseases such as the coronavirus (Favaro-Moreira et al., 2016). Additionally, older adults and those with poly-morbid conditions have been shown to be at higher risk for COVID-19, a deadly combination where chronic disease and impacts are felt more so in terms of nutritional status

precursors. This lends to the necessity for screening and assessment of nutritional status of the older adult patient population (Barazzoni et al., 2020).

Physical Activity

Physical activity is an important part of maintaining overall health. Many people in the older adult population do not meet the recommended physical activity guidelines in general, which further compounds the situation in a lockdown environment (Taylor, 2013; WHO, 2020). Providers need to consistently engage with the patient population to reinforce the benefits of physical activity. Many older adults might not be well versed in online resources regarding physical activity so alternative methods such as handouts should always be readily available for use (Said et al., 2020).

Physical activity needs to be tailored to the individual needs of the older adult patient. Aspects that should be accounted for besides age or illness are the influential factors of obesity, comorbidity, and other complications. The evidence supporting the benefits of physical activity cannot be discounted. Physical activity improves outcomes overall including being able to function in daily activities of living independently, improvement of comorbidities, and cognitive well-being (Bangsbo et al., 2019). Exercise is essential to maintaining movement, ability to build strength, and resist further complications associated with chronic comorbidities. The damage caused by COVID-19 affecting multiple body systems such as the brain, heart, and lung demonstrates a need to understand the level at which disease affects the body, i.e., the physical toll in the healthy older adult versus how disease is magnified in an unhealthy older adult (Felten-Barentsz et al., 2020; Maugeri & Musumci, 2021; Said et al., 2020).

The inability to access community rehabilitation centers, gyms, and limited in-home capabilities for replication of provider driven exercise plans might result in decreased

compliance with the plan of care. In a study done by Sassone et al. (2020) on patients with automatic implantable cardioverter-defibrillators (ICDs), a significant decrease in physical activity was noted since the onset of the pandemic: “To counteract the deleterious effects of physical inactivity during the COVID-19 outbreak, patients should be encouraged to perform indoor exercise-based personalized rehabilitation programs” (p. 285). It has been estimated the social isolation and restricted access to public resources for physical fitness related to the COVID-19 pandemic affected up to three billion people worldwide, resulting in negative health consequences, particularly in the elderly population with the most significant decline in physical activity ranging between 56 and 67% percent (Wilke et al., 2021). This affected health in multiple areas as physical activity has been linked to better overall health in terms of its ability to boost the immune system, improve sleep, and cognitive abilities in patients regardless of age (Fuzeki et al., 2020). The benefits to having an adapted physical activity plan are essential at baseline and even more so in a pandemic environment.

Telemedicine

The impact of the COVID-19 pandemic, which resulted in population confinement and subsequent disruption to the healthcare system, was a primary reason to embrace the adoption of telemedicine (Ohannessian et al., 2020). Many providers were unfamiliar with or had minimal knowledge regarding telemedicine to begin with and had to immediately activate telemedicine protocols for their respective clinics. The abrupt change in healthcare delivery left the potential for many patients to be lost to the system, if not previously under close follow-up.

Several challenges remain for telemedicine to be globally used and integrated into the public health response to COVID-19 and future outbreaks according to Ohannessian et al. (2020):

1. The integration of telemedicine into international and national guidelines for public health preparedness (in keeping with International Health Regulations 2005) and response.
2. The definition of national regulations and funding frameworks for telemedicine in the context of public health emergencies.
3. A strategy to quickly define telemedicine frameworks; use case scenarios; develop clinical guidelines; and standardize triage auto questionnaire and remote patient-monitoring algorithms for any outbreaks at local, national, or global scales.
4. A strategy and operational plan guiding healthcare providers to switch to outpatient teleconsultations and increase tele-expertise and remote patient monitoring.
5. A communication toolkit to inform and educate the population on the recommended use of telemedicine.
6. A data-sharing mechanism to integrate telemedicine providers' data with epidemiological surveillance.
7. A scientific evaluation framework and dedicated research funds to describe and assess the impact of telemedicine during outbreaks. (e18810)

Telemedicine represents an area where an algorithm/guide for primary care providers applying a holistic approach in the primary care setting during care of the older adult patient population during a pandemic would be potentially beneficial.

Algorithms/Guides

Algorithms/guides could organize care priorities and be useful in helping guide a decision toward using evidence-based practice to formulate testable clinical standards of care (Komaroff, 1982; Sox & Stewart, 2015). The COVID-19 pandemic has presented many challenges in

healthcare. Advanced practice providers ultimately want the best outcomes for the patient population despite the environmental factors that come into play such as those with COVID-19. Therefore, an algorithm/guide in primary care would be of benefit.

Summary of the Literature

Despite their long history of use, limited algorithms/guides have been designed for use during pandemics such as COVID-19. The need for further development of an algorithm/guide specific to the health needs of the older adult population was warranted. The impact algorithms/guides could have on clinical practice was evident in the literature. The focus for this DNP scholarly project was driven by the core components of mental health, nutrition, and physical activity for their effects on comorbid conditions. Most of the older adult population has one or more comorbid conditions that places them at greater risk for contracting illness in general and specifically during a pandemic such as COVID-19. This literature review suggested advanced practice providers are better able to capture and identify barriers to health in an alternative healthcare delivery system such as telemedicine when an algorithm is used, ultimately improving healthcare delivery.

Theoretical (Conceptual) Framework

The Stetler (2001) research utilization model was originally developed in 1976 by Stetler and Marram. The unique features of the Stetler model enable collective decision-making amongst peers using evidence-based research to identify an issue, understand the complexities surrounding the problem identified, and create decision-making steps to implement change and facilitate positive outcomes. This framework was used in the development of algorithms/guidelines focused on evidence-based medicine in practice to optimize patient outcomes in extenuating circumstances such as that of the coronavirus pandemic. Five phases of

the Stetler model were designed to “facilitate safe and effective use of research findings”: preparation, validation, comparative evaluation/decision making, translation/application, and evaluation (Stetler, 2001, p. 273; Stetler, 2010, pp. 54-55).

The first phase of the Stetler (2001) model is preparation. In the preparation phase, there is a need to sort out bias and identify a “why” behind the perceived problem. It is important to look at both external (e.g., organizational deadlines and politics that lend to assumed outcomes) and internal factors (e.g., personal beliefs lending to inability to be objective) along with clearly separating relevant information from the literature (Stetler, 2001). In this DNP scholarly project, preparation was advanced practice providers in primary care settings addressing barriers to care in their older adult population, identifying stakeholders, and supporting identified problems through a review of the literature.

The second phase of the Stetler (2001) model is validation. This is an in-depth critical analysis of the literature to eliminate non-credible sources during critical analysis and review, then translating the appraised evidence-based literature into a methodological table. If the evidence is insufficient, the process ends there. If there is sufficient evidence, a comparative analysis through synthesis of the literature is conducted. In this DNP scholarly project, validation was the development of an evidence-based literature review table that succinctly captured the research available at the time preliminary to the development of algorithms/guidelines that focused on the barriers impacting health for those aged 65 and older when faced with lockdown during a pandemic.

The third phase of the Stetler (2001) model is comparative evaluation/decision making. This is where the initial research findings are further analyzed for inclusion or exclusion criteria. There are three parts to consider in a synthesis of the literature: synthesize the cumulative

findings, evaluate degree and nature of other criteria (feasibility), and make a decision whether/what to use (Stetler, 2010). Multiple parts are considered in deciding the applicability of the literature: to use immediately, to reject altogether, and/or consider pending further information. In this DNP scholarly project, the comparative evaluation/decision making phase focused on the subject-matter-expert (SME) panel and extensive literature review to support "the development of practice guidelines, clarify controversial clinical issues, and implement quality improvement activities" (Stetler, 1998, p. 196). This DNP scholarly project used current evidence to support the need for an algorithm/guide for primary care providers caring for the older adult patient population during a pandemic.

The fourth phase of the Stetler (2001) model is translation/application. This phase considers the how the project would work. Stetler's model looks at the three types of use: directional (e.g., change individual, policy, procedure, protocol, algorithm, etc.), cognitive (e.g., validate current practice, increase awareness, etc.), and symbolic (e.g., proposal for change, change or persuade thinking, etc.). In this DNP scholarly project, it was essential to have buy-in from the advanced practice providers in the primary care setting. Translation/application relied on the literature and subject matter expert (SME) feedback to facilitate the development of effective algorithms/guides for primary care providers. An algorithm/guide was developed based on the literature review and SME feedback by applying a holistic approach in the care of the older adult patient population during a pandemic.

The fifth and final phase of the Stetler (2001, 2010) model is evaluation, which uses research to enhance credibility of evidence-based practice. In this DNP scholarly project, which might be considered an explorative field study, the evaluation was summative in identifying the end goal of an algorithm/guideline for use during pandemics with a projected end-point of better

health outcomes. Any changes that may need to be incorporated into the algorithm/guide to ensure continued success would be adopted.

The nature of the Stetler (2010) model with its "practitioner orientation, critical thinking focus, grounding in research utilization and implementation science, and its strong relationship to the experiences of advanced practice level practitioners in the real world of application" effectively enhanced the development of an algorithm/guideline to identify the barriers faced by the population, aged 65 years and older, particularly in the realm of mental health, nutrition, and physical activity preventative care (p. 72). In turn, this facilitated optimal patient care in pandemic environments such as those created by COVID-19 now and in the future.

Summary

The purpose of this Doctor of Nursing Practice (DNP) scholarly project was to develop and validate standardized algorithms/guides to address and overcome the barriers faced by the older adult population (aged 65 years and older) in the realm of mental health, nutrition, and physical activity in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19. The review of the literature revealed that limited algorithms/guides have been designed for use during pandemics such as COVID-19. Thus, validating the need for an algorithm/guide specific to capturing barriers associated with the health of the older adult population in a pandemic environment. The impact algorithms/guides could have on clinical practice was evident in the literature. This literature review suggested advanced practice providers are better able to capture and identify barriers to health in an alternative healthcare delivery system such as telemedicine when an algorithm/guide is used, ultimately improving healthcare delivery.

CHAPTER III

METHODOLOGY

In this chapter, the methods used for the DNP scholarly project are discussed. The design of the project, the setting and sample, and the measures are described. Plans for data analysis are presented along with limitations of the project and ethical considerations.

Design

This DNP scholarly project included the development of evidence-based algorithms/ guides for primary care providers applying a holistic approach in the primary care setting during care of the older adult patient population during a pandemic. This was considered a healthcare delivery intervention (algorithms/guides) as no concise collaborative effort in one algorithm/ guide for care of older adults in the primary care setting exists despite the development of specialty algorithms for other specialty areas of medicine.

Setting

The setting for this DNP scholarly project relied solely on virtual algorithm/guide development and SME panel validation.

Sample

The sample was a SME panel consisting of primary care providers including medical doctors, doctors of osteopathy, nurse practitioners, and physician assistants. Exclusion criteria for the SME panel consisted of providers working outside primary care to include specialty clinics. The focus was on the advanced practice providers' analysis of the evidence-based

algorithms/guides for primary care providers applying a holistic approach in the primary care setting during care of the older adult patient population during a pandemic.

Study/Project Mission, Vision, and Objectives

The mission was to provide evidence-based algorithm/guides for primary care providers in the primary care setting for care of the older adult patient population in a pandemic setting to ensure better patient outcomes. The vision was to improve the quality of care delivered to the older adult population across virtual and in-person primary care settings. This project had the following objectives that were attained in two phases:

1. Phase I: Use the current evidence to create a comprehensive algorithm/guide that focuses on preventative health in terms of mental health, nutrition, and physical activity for primary care providers that employs a holistic approach during care of the older adult patient population in a pandemic.
    - Review the literature for trends pertaining to evidence-based practice questions focused on nutrition, physical fitness, and mental health
    - Identify relevancy to older adult population age equal to or greater than 65 years
    - Develop algorithms/guides to identify trends and address potential barriers applicable to virtual and/or in-person visits

    This information was gathered from a review of the literature and SME feedback. Applicable trends and evidence-based practice were used to develop the algorithms/guides.
2. Phase II: Confirm the relevancy, usability, and validity of the proposed algorithms/guides with a panel of expert clinicians.

- Send algorithms/guides to a 10 member SME panel consisting of a medical doctor, Doctor of Osteopathy, nurse practitioners (NP), and physician assistants for initial review and feedback
- Consider feedback from the responding 6 of 10 SMEs for modification of algorithms/guides.
- Finalize algorithms/guides.

Study/Project Plan

This DNP scholarly project included the following key components:

- Obtained letter of approval from the University of Northern Colorado Institutional Review Board (IRB) application and facility giving permission to have panel of clinicians participate (see Appendix B).
- Assembly of a multidisciplinary team of 10 personnel consisting of a medical doctor, Doctor of Osteopathy, and nurse practitioners/physician assistants. Original survey was sent to 10 individuals and feedback was received from six members.
- Development of an evidence-based algorithms/guides for those aged 65 years and older to identify barriers faced in pandemic environments such as those created by COVID-19.
- Assessment of the algorithms/guides by the final SME panel consisting of the responding six members to confirm relevance, usability, and validity.
- Future dissemination of the DNP project results.

Instrumentation

To measure the outcomes of this DNP project, a survey instrument was developed:

- The survey was conducted virtually.
- The first draft algorithm/guideline was created through a review of the literature that was presented to the SME panel along with the survey (see Appendix C).
- The survey was anonymous.
- Four sections focused on general screening exams, mental health, nutrition, and physical activity. Each section had statements for the SME panel to agree with/disagree with and provide comments.

Data Analysis Procedures

The algorithm/guide went through one virtual survey round with the SME panel.

- The survey was sent with the algorithms/guides to the SME panel for initial review; responses were collected and considered for algorithms/guides edits (see Appendix D).
- A data analysis table from SurveyMonkey was used to reflect SME panel responses and the relevance to validating the algorithms/guides.

Duration of the Project

This DNP scholarly project was broken into two phases. The duration of Phase I, development of algorithms/guides, took 12 weeks to complete. The duration of Phase II, validation of algorithms/guides by the SME panel, took three weeks to complete.

Ethical Considerations

Approval from the University of Northern Colorado's IRB was obtained prior to initiating the DNP project (see Appendix B). All SME panel participants ware strictly voluntary

and were able to drop out/fail to complete the survey at any time without repercussion. The survey was completed anonymously so there was no way to attribute the data to a particular provider. The data were aggregated and stored on a password protected computer. A statement was included at the top of the survey explaining the project and indicating that by completing the survey, the SME panel member was agreeing to participate.

CHAPTER IV

DATA ANALYSIS AND RESULTS

The results of this DNP scholarly project and data analysis of the survey submitted to the SME panel are presented in this chapter. The purpose of the survey was to validate the algorithms/guides as they related to mental health, nutrition, and physical activity in analyzing barriers to patients aged 65 years and older and their feasibility during pandemic eras. Results are presented with a bar chart for visual effect analysis.

Purpose of the Project

The purpose of this Doctor of Nursing Practice (DNP) scholarly project was to develop and validate standardized algorithms/guides to address and overcome the barriers faced by the older adult population (aged 65 years and older) in the realm of mental health, nutrition, and physical activity in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19. The intent was to create holistic algorithms/guides as a reference for advanced practice providers in primary care settings to improve care to this specific population under restricted pandemic conditions.

Objectives

Objective I: Evaluation of Current Evidence and Development of Algorithms/Guides

Evaluation of Current Evidence

No concise, collaborative effort, interactive algorithm/guide could be found for care of the older adult in primary care despite the development of specialty algorithms for other areas of medicine. Additionally, limited algorithms/guides were designed for use during pandemics such

as COVID-19. The impact algorithms/guides could have on clinical practice was evident throughout the literature. The lack of a consistent guide has the potential to lead to missed barriers impacting health and well-being in lockdown.

This DNP scholarly project was driven by the core components of mental health, nutrition, and physical activity for their effects on comorbid conditions further influenced by the coronavirus pandemic. Advanced practice providers are better able to capture and identify barriers to health in an alternative healthcare delivery system such as telemedicine when an algorithm is used, ultimately improving healthcare delivery. The development of a standardized collaborative interactive algorithm/guide into an evidence-based triage auto questionnaire was deemed to be relevant to current times and helpful to providers in the primary care setting.

Advanced practice providers ultimately want the best outcomes for the patient population despite environmental factors. The uncertainty in medical practice felt by many advanced practice providers who provide care to older adults throughout the healthcare system was caused by inter-related factors. The COVID-19 pandemic presented many challenges in health care and prompted the initiative to find or develop an algorithm/guide to identify barriers to the patient population aged 65 years and older.

Interactive collaborative algorithms/guides were built by the author around the following core components: mental health, nutrition, and physical activity. The healthcare delivery intervention (algorithms/guides) was designed around improving healthcare delivery during pandemic eras for those aged 65 years and older in the primary care setting (see Appendix D for algorithms/guides). Each of the beforementioned core components affect comorbid conditions at baseline. If nutrition, mental health, and physical activity are out of balance, they can influence pre-existing conditions that are magnified in illness severity.

Each algorithm/guide was designed with the intent to deep-dive into what questions would lead to identifying barriers faced by the older adult population, particularly in a pandemic such as COVID-19. A review of the literature and evidence-based search aided development in ensuring the questions were clinically relevant and in line with current practice guidelines. The end result was four algorithms/guides that focused on identifying barriers to general screening exams, mental health, nutrition, and physical activity.

Objective II: Subject Matter Expert
Panel and Panel Demographics

A subject-matter-expert (SME) panel consisting of primary care providers including medical doctors, doctors of osteopathy, nurse practitioners, and physician assistants were key to extracting the usefulness and validation of the algorithms/guides in practice. Providers working outside primary care to include specialty clinics were excluded in the consideration of validation. The focus for this DNP scholarly project sought the advanced practice provider's analysis of the evidence-based algorithms/guides in primary care applying a holistic approach during care of the older adult patient population during a pandemic.

Advanced practice providers in the primary care setting were the prime targets of the algorithms/guides survey created with SurveyMonkey software. Recruitment of survey participants was achieved using the snowball method through professional networks of the primary investigator and committee members. The primary investigator and committee chair compiled a list of five potential candidates of advanced practice providers using their professional networks. Potential participants were invited to participate through an introductory e-mail and were encouraged to forward the survey to any colleague who was an advanced practice provider in the primary care setting caring for patients aged 65 years and older.

The survey was primarily completed by nurse practitioners with a medical doctor and physical therapist contributing. Six survey response were obtained in the validation process of the algorithms/guides. Each of the respondents had more than 10 years of experience in their respective professions. Participants were from the following healthcare work environments: 33.33% (*n* = 2) of respondents worked in a hospital clinic setting, 44.45% (*n* = 3) of respondents worked in free-standing clinics/urgent care settings, and 22.22% (*n* = 1) worked in homecare environments. The primary patient population served were those aged 65 years and older with 83.33% (*n* = 5) of respondents providing this response and 16.67% (*n* = 1) saw patients aged 35-54 years. The primary gender for survey responses yielded 83.33% (*n* = 5) female and 16.67% male (*n* = 1).

The survey was estimated to take less than an hour to complete and participants electronically agreed to participate (see Appendix C for survey). The survey began with five questions collecting basic demographics; the following two questions referenced the algorithms/guides that were included as attachments with the recruitment letter; the next four questions were primarily for yes/no validation purposes with option for comments and were followed by a final question to elude further comments of feedback not previously addressed. As mentioned previously, six surveys were returned within the data collection time frame and included in the data analysis. Figures 1-5 provide visual representations of the demographics collected from participants.

Figure 1

What Is Your Current Professional Title?

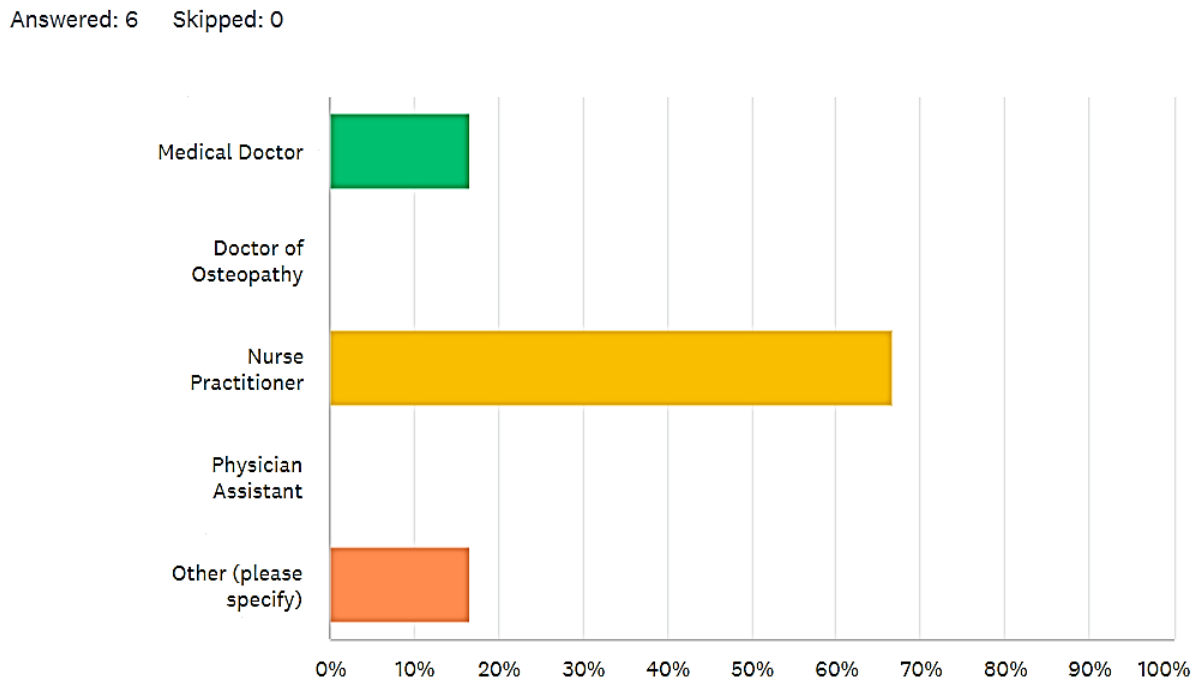


Figure 2

Number of Years Working in Your Current Profession?

Answered: 6 Skipped: 0

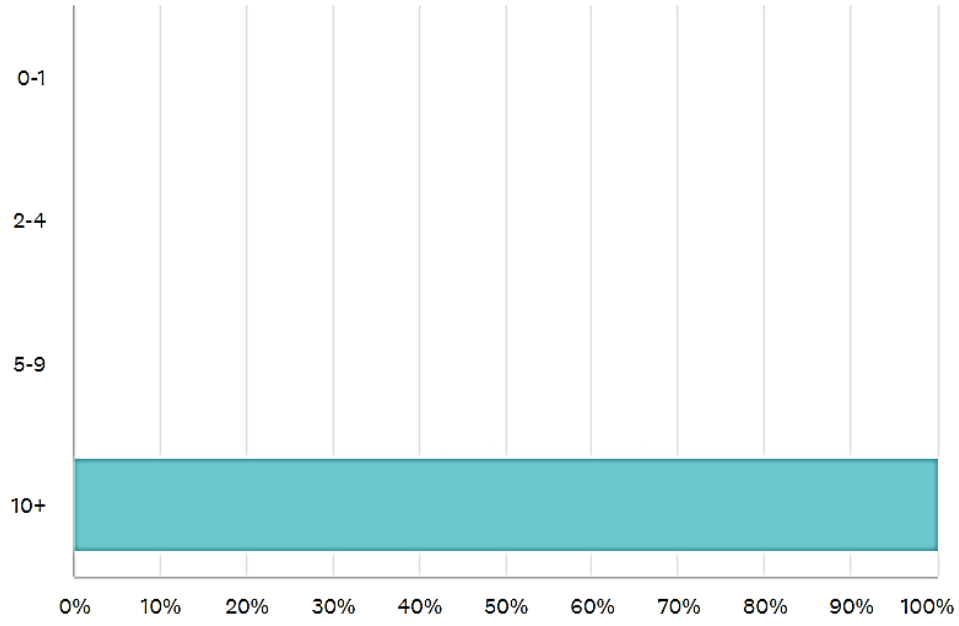


Figure 3

In What Healthcare Setting Do You Practice?

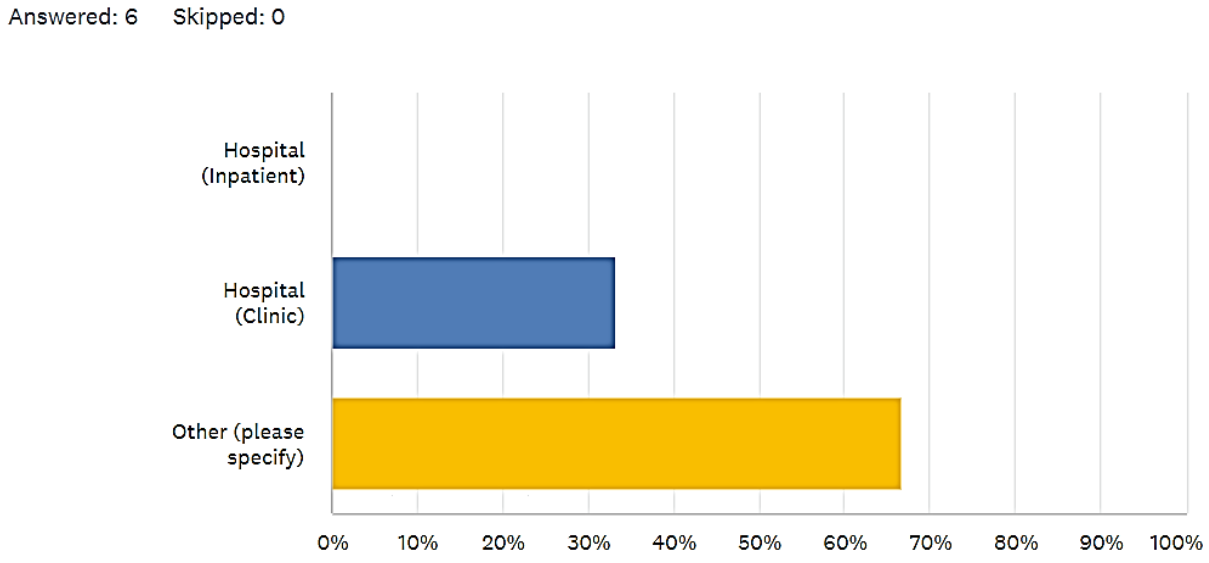


Figure 4

What Is the Age Group of Your Primary Patient Population?

Answered: 6 Skipped: 0

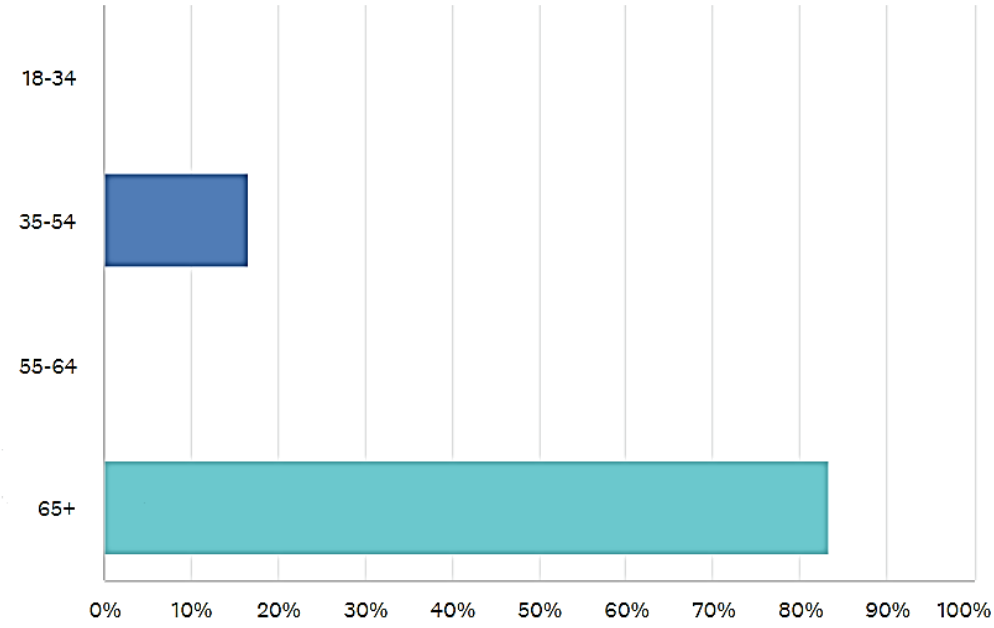
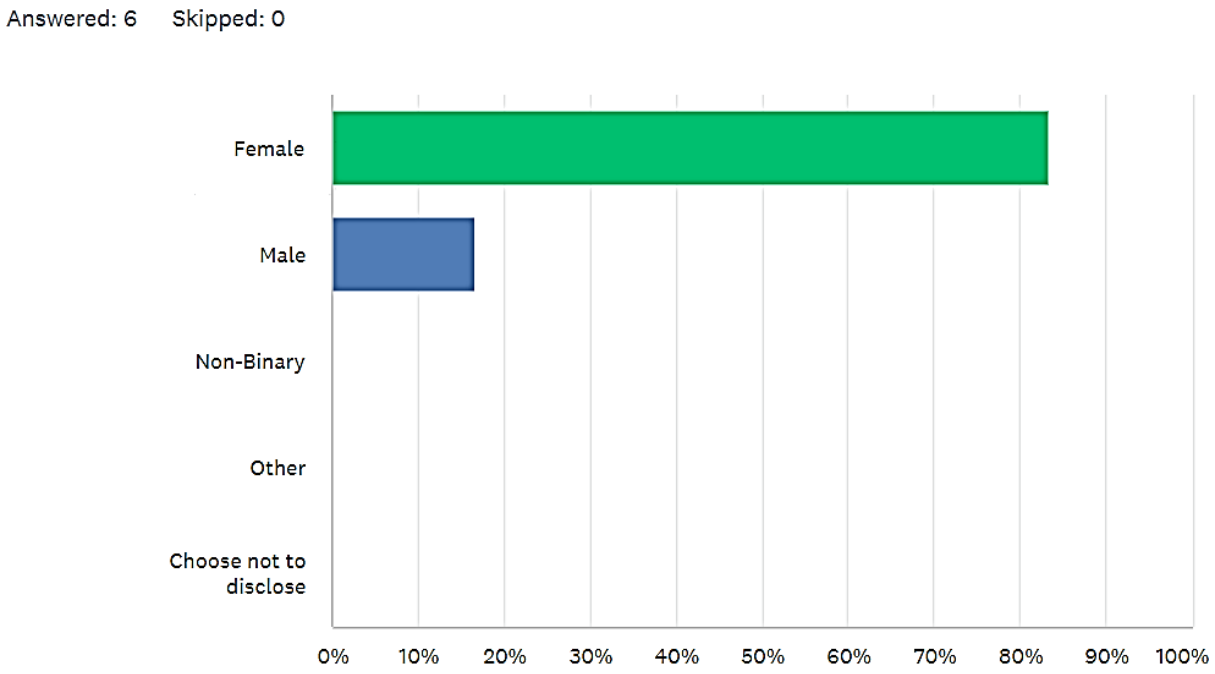


Figure 5

What Is Your Gender?



Objective III: Translation and Validation of Algorithms/Guides Determination of Relevancy, Usability, and Appropriateness to Current Practice

Of survey respondents, 83.33% (*n* = 5) found the algorithms/guides to be value-added to clinical practice and in-line with current practice guidelines. Another 16.67% (*n* = 1), while agreeing the algorithms/guides were value-added and in-line with current practice guidelines, felt it could be improved by adding specifics as they pertained to types of breast cancer screening exams (i.e., depending on level of risk—ultrasound, mammogram, or magnetic resonance imaging [MRI]).

With regard to whether or not the questions on the algorithms/guides were appropriate for those aged 65 years and older, 66.67% (*n* = 4) agreed while 33.33% (*n* = 2) agreed,

recommended additional information such as a Dexa Scan be added for women older than 65 years, and to consider if someone else prepared or shopped for food on behalf of the patient (i.e., were they afraid to go shopping?).

The SME panel confided they would prefer the algorithms/guides be digitalized for use with electronic healthcare records. In terms of whether or not they would use the algorithms/guides in practice, 83.33% (n = 5) agreed and (16.67% (n = 1) agreed but recommended additional information be included.

In terms of additional comments for betterment of the algorithms/guides, the following comments were made by survey respondents meeting the criteria for inclusion: (a) “Ask about fear of going out in public: and (b) “Algorithms and guides are valid based on current literature and practice. Their content and flow are excellent. Would definitely use them in practice.”

Objective IV: Future Implementation in Practice

The setting for this DNP scholarly project relied solely on virtual algorithm/guide development and SME panel validation. In the future, an evaluation with a pilot test in a primary care clinical setting could be conducted through a focus group method asking questions about the algorithms/guides in actual clinical practice by primary care providers caring for patients over the age of 65 in a clinic setting. The developed and validated algorithms/guides would be assessed by a small group of advanced practice providers to identify if it would be (a) helpful for their work environment? (b) would they use it with every patient over the age of 65 years? and (c) if not, what selection criteria would they use to determine who they used the algorithms/guides with and whom they did not. This DNP scholarly project was completed utilizing two phases: Phase I—Development of algorithms/guides and Phase II—Validation of

algorithms/guides by SME panel. A primary care clinical setting pilot study could be considered in the future.

Analysis of Study Question

This DNP scholarly project aimed to answer the following research question:

Q1 What focus points in terms of mental health, nutrition, and physical activity are important to factor into standardized algorithms/guides to address barriers in the older adult population during a pandemic lockdown?

The question was answered by an in-depth, thorough review of the literature and creation of a survey for validation of proposed algorithms/guides through advanced practice providers in the primary care setting. Preliminary data were collected and analyzed in terms of validating the algorithms/guides and translation and evaluation plans were established for future use at such time the algorithms/guides could be successfully translated into clinical practice.

CHAPTER V

DISCUSSION

In this chapter, the DNP scholarly project is summarized including conclusions, limitations, and recommendations for future practice. A reflection of how this project met the outcomes of the American Association of Colleges of Nursing's (Hathaway et al., 2006) *The Essentials of Doctoral Education in Advanced Nursing Practice* using EC as PIE (Enhance, Culmination, Partnerships, Implements, and Evaluation) criteria (Waldrop et al., 2014) is provided.

Conclusions

The purpose of this DNP scholarly project was to develop standardized algorithms/guides to address and overcome the barriers faced by the older adult population (aged 65 years and older) in the realm of mental health, nutrition, and physical activity in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19. The intent was to create and validate holistic algorithms/guides as a reference for advanced practice providers in primary care settings to improve care to this specific population under restricted pandemic conditions. Algorithms/guides were developed through extended review of the literature and evaluation by a subject matter expert (SME) panel to validate relevancy to clinical practice and current evidence-based guidelines.

This DNP scholarly project was accomplished in two phases: Phase I—Development of algorithms/guides and Phase II—Validation of algorithms/guides by SME panel. In the future, a pilot study in the primary care clinical setting could be considered. This would be important to

ensure the algorithms/guides were successful in identifying barriers to the older adult population, thus improving patient outcomes. The multidisciplinary panel of experts that reviewed the algorithms/guides deemed them to be in-line with current practice guidelines and directly relevant to the clinical setting, additionally noting they would use them in their clinical practice and it would be beneficial to digitize for use in electronic health record systems. Additional suggestions were considered for algorithms/guides implementation but excluded due to specific detail (i.e. type of breast cancer screening exam, DEXA scan, etc.). The idea behind the algorithms/guides was a generalized broad capture of whether or not an exam had taken place.

Limitations

This DNP scholarly project did have several limitations. While an adequate number of SME panel experts responded to the SurveyMonkey correspondence, it would have been helpful to have a more robust number of responses to identify if there would have been greater variances in decisions. The length of time to collect responses was limited due to schedule constraints and further impacted by on-going stress factors in terms of time and work commitments that might have limited how many SMEs were able to respond. Additionally, the COVID-19 pandemic created the greatest barrier to this DNP scholarly project.

Recommendations for Future Practice

While the COVID-19 pandemic created barriers, this DNP scholarly project successfully completed its purpose in development of the algorithms/guides and validation by the SME panel. Current evidence was used to create collaborative interactive algorithms/guides for primary care providers that employed a holistic approach during care for the older adult patient population during a pandemic. The relevancy and usability of the proposed algorithms/guides were

validated with a panel of expert clinicians with the intention of implementing the tool at a later date in the primary care setting.

In the future, there might be opportunities to pursue a pilot study in a primary care clinical practice setting to gain feedback from the older adult population on whether or not the barriers to their care were clearly defined once the restriction/barriers currently in place from the COVID-19 pandemic are released. Additionally, it would be helpful to determine if the advanced practice providers trialing in their practice environment would consider use on all patients over the age of 65 years or if they would have exclusion criteria for who they would and would not use the algorithms/guides on in clinical practice.

Reflections on Executing a Successful Doctor of Nursing Practice Project

Five criteria must be met in order to achieve the rigor of excellence necessary to meet the outcomes of the American Association of Colleges of Nursing's (2006) *Essentials* and execute a successful DNP scholarly project. Those criteria are defined in the EC as PIE acronym (Enhance, Culmination, Partnerships, Implements, and Evaluation) as evidenced by Waldrop et al. (2014). This DNP scholarly project met the EC as PIE criteria as follows:

- E = *Enhance* health outcomes, practice outcomes, or health care policy. This DNP scholarly project involved development of a collaborative interactive algorithm/guide to identify barriers in the patient population aged 65 years and older during pandemic eras to improve health outcomes. Review of the literature revealed no concise collaborative effort interactive algorithm/guide existed for care of the older adult in primary care despite the development of specialty algorithms for other areas of medicine. Hence, this DNP scholarly project became very timely in relation to the current COVID-19 pandemic.

- C = Reflect a *culmination* of practice inquiry. A culmination of practice inquiry was evident in asking critical questions to identify the unknowns in the practice setting during real-world unfolding events as related to the COVID-19 pandemic. An extensive literature review and synthesis were utilized to develop evidence-based algorithms/guides that highlighted potential barriers to health care in the older adult population. The theoretical framework of the Stetler (2001) model was used to evaluate the literature and use knowledge gained to influence change in the clinical practice setting.
- P = Require engagement in *partnerships.* Partnerships were evident throughout the execution of this DNP scholarly project. Communication was pivotal in engaging the stakeholders in gauging interest and need for practice change. The project involved recruitment of and coordination with key stakeholders to form a panel of experts to validate the algorithms/guides. This multidisciplinary team of stakeholders was responsible for ensuring the algorithms/guides were in-line with current practice guidelines and relevant to the clinical setting.
- I = *Implement*/apply/translate evidence into practice. In the literature review process, no concise collaborative effort interactive algorithm/guide could be found for care of the older adult in primary care despite specialty algorithms for other areas of medicine. The setting of the COVID-19 pandemic created a real-time need for such an algorithm/guide. Four algorithm/guides were created to identify key barriers to care in the patient population aged 65 years and older and were validated by the SME panel.

- E = Requires *evaluation* of health care, practice, or policy outcomes. The DNP scholarly project included formative and summative evaluation as recommended by Stetler (2001). It focused on validating the algorithms/guides with a panel of experts to ensure they were in-line with clinical practice guidelines prior to implementation in a clinical practice setting. The panel of experts was in the advanced practice profession and had direct knowledge of the patient population being assessed, thus being able to validate the algorithms/guides for use in the healthcare arena. A SurveyMonkey questionnaire was utilized to obtain the evaluations.

Summary

Due to the unique nature of the COVID-19 pandemic, there was an identified real-time need for a collaborative interactive algorithm/guide to identify barriers to health care associated with the older adult population aged 65 years and older. No concise collaborative effort interactive algorithm/guide could be found for care of the older adult in primary care despite specialty algorithms for other areas of medicine. This DNP scholarly project sought to develop a standardized algorithm/guide to address and overcome the barriers faced by the population, aged 65 years and older, particularly in the realm of diet, physical activity, and mental health in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19 now and in the future.

This DNP scholarly project was completed in two phases: Phase I—Development of the algorithms/guides and Phase II—Validation of the algorithms/guides with the SME panel. The panel of experts validated that the algorithms/guides were in-line with clinical practice guidelines and relevant to the clinical practice setting. The ability to provide alternative options for the older adult population and to ensure progress on the continuum of health in an era where community

resources are affected by pandemic restrictions is essential for optimization of care. Future recommendations would be to complete a pilot study with the algorithms/guides in the clinical practice setting applying evidence-based practice.

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APPENDIX A

EVIDENCE TABLE

Table A1

Evidence Table

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Bedock et al. (2020)	♦ Prevalence & severity of malnutrition in adult COVID-19 patients	♦ Observational ♦ Longitudinal ♦ Quantitative	♦ E3M Institute in Pitie-Salpetriere hospital ♦ 114 patients (69 ♂ & 45 ♀ average age 59 yrs) ♦ Inclusion: 160 admitted patients ♦ Exclusion: 46 w/incomplete nutritional data	♦ Timeline March 21st – April 24th 2020 ♦ Instruments: ⁘ Questionnaire ⁘ Calibrated Scales ⁘ GLIM Criteria ⁘ MNA Tool	♦ 42.1% -malnourished ♦ 18.4% - severely malnourished ♦ ↓ albumin = severe adverse outcomes ♦ Poor nutrition = risk factor f/CAP ♦ Severe protein-calorie malnutrition = altered thermoregulation	♦ Sample size (114) ♦ Selection bias cannot be ruled out ♦ Bi-directional relationship between COVID-19 & malnutrition ♦ Further Research: Impact of nutritional care on long-term prognosis w/COVID-19
Bojdani et al. (2020).	♦ A "how to" guide to inform practitioners about national guidelines and healthcare policy pertaining to psychiatric care during the pandemic	♦ Observation ♦ Retrospective ♦ First-hand experience	♦ USA ♦ Colleagues	♦ Informal survey ♦ Interview	♦ Barriers to care ⁘ PPE ⁘ Untrained staff ⁘ Patients fear ⁘ Inpt environment hindering care ⁘ ↓ effectiveness of therapeutic milieu ⁘ ↑ psychiatric hospitalizations ♦ Resource limit: PPE, testing kits, hospital beds, staff shortages ♦ No evidence suggesting informed patient care in terms of psychiatric hospitalization ↑ risk of COVID-19 ⁘ Does the patient concur/included in decision? ♦ Promoting Care (PACT): COVID-19 response protocols	♦ Weakness: ⁘ Only used PubMed f/literature review ⁘ Potential for bias dependent on colleagues who responded ♦ Strengths: ⁘ Table 1: Psychiatric COVID-19 Practice Guidance ⁘ Table 2: Screening questions ⁘ Table 3: Concerns of psychiatric physicians across the country during the COVID-19 pandemic ⁘ Setting evaluation: outpatient, emergency room, inpatient units, consultation services, and community

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Burke et al. (2020).	♦ Neurosurgical algorithm f/COVID-19 community infection	♦ Literature review w/expert advice from first-hand experience	♦ Literature reviewed relevant to neurosurgery, surgical case scheduling, resident & advanced practitioner staffing ♦ Multi-D panel; Neurosurgeons w/Chinese neurosurgical experience	♦ Checklists ♦ Algorithms ♦ Surge Guides (restricting OR access) ♦ Tiered Levels (limit volume & allow resource allocation)	♦ No current studies that address the strains on neurosurgical practice from COVID-19 ♦ Sparse specific recommendations	♦ Only English language articles were included in review ♦ Most criteria specific to one institution ♦ PCM requires a pool of resident physicians of different levels to implement ♦ Surge level system requires knowledge of the # of cases in the community
Feinstein (1974).	♦ Algorithm construction	♦ Analysis	♦ Clinical	♦ Algorithm ♦ Flow charts ♦ Decision tables ♦ Diagnostic reasoning	♦ Justification ♦ Familiarity with clinical activities ♦ Complex interpretations	♦ None
Felten-Barentsz et al. (2020).	♦ Guideline	♦ Literature review	♦ Hospital ⁘ adult patients ⁘ acute hospital setting	♦ 2-phases of hospitalization ⁘ critically ill admitted to ICU ⁘ critically ill admitted to COVID ward	♦ Safety, treatment, discharge, and staffing recommendations	♦ One country: Netherlands ♦ Generalization to other countries may be limited

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Foieni et al. (2020).	♦ Formulate a predictive model for rationalization of resources & specific treatment paths	♦ Pilot-Study ♦ Non-randomized	♦ 119 hospitalized patients w/lab-confirmed COVID-19 at Busto Arsizio Hospital (Varese, Italy) ♦ 79 patients (66%) selected f/derivation of model (Internal Medicine) ♦ 40 patients (34%) selected f/internal validation (COVID-19 departments) ♦ Mostly ♂ (66%) w/mean age of 68yo (31-91yo)	♦ Timeline: March 15 – April 30, 2020 ♦ Baseline predictor variables: ⁘ demographics ⁘ comorbid conditions ⁘ physical exam ⁘ labs ♦Data collection	♦ 8 clinical & lab variables placing patients into 4 groups w/↑ risk of death & other adverse outcomes ♦Tool f/risk stratification	♦ Dataset from single hospital ♦ Reduced # of cases ♦Strengths: ⁘ Defined predictors ⁘ Wide spectrum (mild-severe-mechanical ventilation) ♦<u>Further Research:</u> Further validation required of predictive model discussed, prior to implementation as a decision-making tool
Formisano et al. (2020).	♦Reduce risk of malnutrition and improve clinical outcomes	♦Pilot study	♦ 94 non-ICU patients ⁘ 68 > 70 yrs	♦ Personalized nutrition protocol ♦ Age adjusted Nutritional Risk Screening	♦ Nutritional strategies should be implemented to prevent worse clinical outcomes	♦ One facility: Giovanni Borea Civil Hospital in Sanremo, Italy
Goldberg et al. (1979).	♦↓ GHQ to 28-items ♦ Assessing f/psychiatric disorder/general health/medical complaints	♦Pilot Study	♦ Utilized by primary care	♦ Screening questionnaire (self-administered) ♦ Multivariate analysis w/varimax rotation of 6 factors ↓ 4 factors	♦ Intended f/studies that require more information ♦ Stable scale	♦ Historical reference behind general health questionnaire (GHQ)

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Gorenko et al. (2021).	♦Identify remotely-delivered evidence based interventions f/social isolation & psychological distress ♦Comprehensive overview of interventions ♦Identify barriers to remote-delivery of reviewed interventions	♦ Literature review	♦No sample ♦Electronic database search: PSYCH info, PubMed, Google Scholar in May 2020 ♦Terms: social isolation, loneliness, or depression, anxiety, therapy, psychological intervention	♦None	♦Barriers: ⁘ attitudes r/t technology ⁘ ability to access ⁘ limited experience/skills ⁘ involvement of others ♦Limited volunteer base f/social intervention	♦English language only ♦<u>Further Research:</u> ⁘ Remotely-delivered interventions w/no assistance f/isolation & loneliness ⁘ Optimal level of clinician contact f/favorable treatment outcomes ⁘ Methods of remote delivery have not been evaluated ⁘ Feasibility & efficacy of reviewed interventions ⁘ Safety & risk assessment methods ⁘ Evaluation/Translation of psychological interventions f/social/interpersonal problems to remote-delivery is lacking
Khosravani et al. (2020).	♦Development of a protected code stroke algorithm	♦Pilot study	♦In-/Outside hospital settings	♦Algorithm ♦Multi-D panel & subject matter experts (SME)	♦Resilient clinical stroke team	♦None

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Lopez et al. (2020). "	♦Triage algorithms for palliative consults & acute symptomatic management f/both patients diagnosed w/or under investigation (PUI) f/COVID-19	♦Pilot study ♦Delphi method	♦ 305 inpatients w/COVID-19/PUI ♦Timeline: March 23 – April 23, 2020	♦Algorithm ♦(2) team-based approach consisting of a Multi-D panel & subject matter expert (SME) ♦GAP consult team: ⁘ 5 board-certified palliative care specialists ⁘ 2 advanced care providers ⁘ chaplain ⁘ social worker	♦Allowed GAP team to provide specialized palliative care while advising frontline staff during the peak of the COVID-19 pandemic.	♦Inpatient only ♦<u>Further Research:</u> ⁘ Replicability of inpatient palliative care team triage and symptomatic management algorithms ⁘ Relevance to outpatient palliative care groups
Luc et al. (2020).	♦Focus on dementia & social health in setting of SARS-CoV-2	♦Review of recommendations	♦Dementia population (elderly) ⁘ alone ⁘ family ⁘ long-term care	♦None	♦Specific care f/dementia patients to preserve long-term functioning ♦Mental/Social ♦Continued review of epidemiological situations to enhance guideline updates	♦None
Maugeri & Musumci (2021).	♦ The benefits of physical activity counteracting COVID-19 consequences	♦Literature review	♦None/Review	♦Benefits of physical activity ♦ Adaptation in setting of COVID-19 ⁘ during & post	♦ May factor as preventative against COVID-19 ♦ Complementary tool in aiding resilience to stress & ↓ anxiety & depression	♦None

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Miele et al. (2020).	♦Importance of telemedicine in continuity of care	♦Analysis of technology apps for Parkinson's Disease	♦None/Review	♦Technology Apps ⁘ Parkinson's Diary APP ⁘ NMSS ⁘ Conley Scale ⁘ Lift Pulse & PD ME Apps ♦Clinical visit	♦ Overall benefits render telemedicine progressively part of the neurological clinical practice ♦Medical exam remains cornerstone of practice	♦Device related limits ♦Safeguarding data ♦Need for in-person exam
Noone et al. (2020).	♦Effectiveness of video calls f/reducing social isolation & loneliness in adults	♦Systematic review of literature	♦None/Review ♦Mean age 65yo	♦Randomized controlled trials (RCTs) ♦Quasi-RCTs	♦Uncertain evidence on the effectiveness of video call interventions to reduce loneliness in older adults ♦No evidence of the effectiveness of video call interventions to address social isolation in older adults ♦Evidence f/depression also uncertain	♦Evidence limited ♦Not enough data to report bias ♦Only 3 studies selected for inclusion ♦<u>Further Research:</u> ⁘ More rigorous methods and more diverse and representative participants ⁘Studies to target older adults, who are demonstrably lonely or socially isolated across a range of settings

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Ohannessian et al. (2020).	♦Updated framework regarding telemedicine	♦Review	♦Global	♦Framework	♦Lack of regulatory framework to authorize, integrate, and reimburse telemedicine ♦ Challenges: ⁘Integration ⁘Definitions ⁘Framework Strategy ⁘Operational Plan ⁘Communication Toolkit ⁘Data-sharing mechanism ⁘Scientific evaluation framework & research funds	♦Brief review ♦One viewpoint
Pahuja & Wojcikewych (2021).	♦Unique barriers to palliative care & end-of-life	♦Case study	♦11-bed inpatient unit ♦Virginia Commonwealth University Health System ♦Richmond, VA	♦Observation	♦Unintended consequences r/t patient isolation & preservation of PPE ⁘Limited visitors ⁘Care team limit ⁘Unable to transfer to palliative floor d/t cohorting resulting in ↓ access to trained palliative care staff	♦One case study

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Provenzano et al. (2020).	♦Highlight evolution of outpatient medical care during COVID-19 w/focus on the clinical & economic consequences	♦N/A	♦Outpatient environment	♦Framework ⁘Telehealth; reduction of regulations ⁘Remote prescribing ⁘Surgery center staffing & management ♦Government Support Programs: ⁘CARES ACT ⁘PPE loans ⁘Medicare accelerated and advance payment program ⁘Business interruption insurance ♦Staff Safety & Well-Being	♦To clinically and financially navigate this pandemic, medical practices will need operational and strategic plans that allow for successful reintegration of clinical and surgical practice	♦Provided a concise overview of clinical and economic strategies, but framework was a bit difficult to follow.
Sassone et al., (2020).	♦Quantify ↓ in physical activity in patients w/automatic implantable cardioverter-defibrillators (ICDs) f/primary prevention of sudden death	♦Quantitative ♦Pilot Study	♦24 patients (72 ± 10 yrs., 17 ♂) w/ICDs (Boston Scientific)	♦Home Monitoring	♦Abrupt & statistically significant ↓ in physical activity during in-home confinement quarantine ♦ Need to encourage indoor exercise-based personalized rehabilitation program	♦ Small cohort ♦ One setting ♦Further Research: ⁘ Future larger studies may be necessary

Table A1 continued

Author (Year)	Purpose	Design	Setting / Sample	Survey/Instruments	Findings (Statistics)	Limitations
Sox & Stewart (2015).	♦SCAMPs & CPGs, two approaches to developing clinical standards of care, are fundamentally equivalent	♦Commentary	♦N/a	♦SCAMP ♦CPG ♦Algorithms	♦Clinical Practice should include: ⁘systematic review of pertinent evidence ⁘recommendations f/action ⁘representation of the standard of practice in a form (i.e., algorithm) ⁘clinical standard in practice at the bedside ⁘explain alternate actions taken	♦None
Wilke et al. (2021).	♦Pandemic confinements & the effects on physical activity	♦Observational ♦Pilot Study	♦ Multinational ♦18 yrs & older from a country w/the following: ⁘ 39 ± 15 yrs (59% ♀) ⁘ registered cases of SARS-CoV-2 ⁘ government restrictions enforced	♦Nordic Physical Activity Questionnaire (NPAQ-short) ⁘ leisure ⁘ job ⁘ moderate/vigorous	♦↓ in physical activity (PA) affect those most active prior to pandemic ♦ Oldest & youngest individuals showed the highest reduction in PA ♦ Vigorous PA ↓ 56-76% f/70 yrs and older ♦ Education/Socio-economic status dependency ♦ Long-term consequences of ↓ PA	♦ Self-reported data (bias) ♦ Lack of participation r/t technology

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

Date:	10/12/2021
Principal Investigator:	Becky Bautch
Committee Action:	**IRB EXEMPT DETERMINATION – New Protocol**
Action Date:	10/12/2021
Protocol Number:	2109029962
Protocol Title:	Healthcare Algorithms/Guides in Pandemic Eras: Capturing Critical Data (Aged 65 & Older)
Expiration Date:	

The University of Northern Colorado Institutional Review Board has reviewed your protocol and determined your project to be exempt under 45 CFR 46.104(d)(702) (703) for research involving

Category 2 (2018): EDUCATIONAL TESTS, SURVEYS, INTERVIEWS, OR OBSERVATIONS OF PUBLIC BEHAVIOR. Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 45 CFR 46.111(a)(7).

Category 3 (2018): BENIGN BEHAVIORAL INTERVENTIONS IN CONJUNCTION WITH THE COLLECTION OF INFORMATION FROM ADULT SUBJECTS through verbal or written responses (including data entry) or audiovisual recording if the subject prospectively agrees to the intervention and information collection and at least one of the following criteria is met: (A) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; (B) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement,

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Institutional Review Board

or reputation; or (C) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 45 CFR 46.111(a)(7). For the purpose of this provision, benign behavioral interventions are brief in duration, harmless, painless, not physically invasive, not likely to have a significant adverse lasting impact on the subjects, and the investigator has no reason to think the subjects will find the interventions offensive or embarrassing. Provided all such criteria are met, examples of such benign behavioral interventions would include having the subjects play an online game, having them solve puzzles under various noise conditions, or having them decide how to allocate a nominal amount of received cash between themselves and someone else. If the research involves deceiving the subjects regarding the nature or purposes of the research, this exemption is not applicable unless the subject authorizes the deception through a prospective agreement to participate in such research.

You may begin conducting your research as outlined in your protocol. Your study does not require further review from the IRB, unless changes need to be made to your approved protocol.

As the Principal Investigator (PI), you are still responsible for contacting the UNC IRB office if and when:

- You wish to deviate from the described protocol and would like to formally submit a modification request. Prior IRB approval must be obtained before any changes can be implemented (except to eliminate an immediate hazard to research participants).
- You make changes to the research personnel working on this study (add or drop research staff on this protocol).
- At the end of the study or before you leave The University of Northern Colorado and are no longer a student or employee, to request your protocol be closed. *You cannot continue to reference UNC on any documents (including the informed consent form) or conduct the study under the auspices of UNC if you are no longer a student/employee of this university.
- You have received or have been made aware of any complaints, problems, or adverse events that are related or possibly related to participation in the research.

If you have any questions, please contact the Research Compliance Manager, Nicole Morse, at 970-351-1910 or via e-mail at nicole.morse@unco.edu. Additional information concerning the requirements for the protection of human subjects may be found at the Office of Human Research Protection website - http://hhs.gov/ohrp/ and https://www.unco.edu/research/research-integrity-and-compliance/institutional-review-board/.

Sincerely,

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

Nicole Morse
Research Compliance Manager

University of Northern Colorado: FWA00000784

Carter Hall 2008 | Campus Box 143 | Greeley, CO 80639 | Office 970-351-1910

APPENDIX C

SURVEY

Dear Healthcare Provider,

My name is Becky Marie Bautch and I am a candidate for the Doctor of Nursing Practice (DNP) degree at the University of Northern Colorado School of Nursing. I was given your name and email from Dr. Kathleen Dunemn as a person with relevant expertise to my project area which includes healthcare assessment algorithms/guides in pandemic eras, capturing critical data in patients aged 65 years and older.

I would like to invite you to participate in a project aimed at developing collaborative interactive algorithms/guides for use in pandemic eras. The COVID-19 pandemic has brought about many concerns for populations across the globe in terms of health and well-being. It has changed the way patients interact within society and limited access to resources that were once readily available. Many patient interviews in primary care are now being accomplished over the phone or through virtual online assessments, which limits the advanced practice providers' ability to get to the root of issues that patients may be facing. Ideally the program will be pilot tested in a primary care setting after completion of this project.

Should you agree to participate, you will be asked to critically review one draft of the collaborative interactive algorithms/guides and answer questions focused on feasibility, usability, and applicability of the algorithms/guides with limited amounts of free text space. The total time commitment for participation in this project (including review of the algorithm/guide draft and questionnaire completion) is estimated to be less than 1 hour. Your responses will be kept confidential, and your participation is completely voluntary.

The questionnaire/survey can be accessed here: https://www.surveymonkey.com/r/Algorithm-Guide-DNP-BB

After you complete the questionnaire, please press the "DONE" button and the completed survey will automatically be sent to me.

Please complete and submit the questionnaire survey as soon as possible but by no later than Oct 21, 2021.

Algorithms/Guides are attached (to this email) for easier viewing capability and for reference when completing the questionnaire/survey above, should you choose to participate. *Please feel free to share this email with colleagues who may be interested in review and commenting on this project.*

If you have any questions about this project, you may contact me via email at baut0081@bears.unco.edu or my DNP Project Chair at: Kathleen.dunemn@unco.edu. Thank you for your consideration and support of this scholarly project.

This Project was approved by the UNC IRB on Oct 12, 2021.

Sincerely,

Becky Marie Bautch, DNP Candidate, CCRN, AGACNP-BC, ACCNS-AG

SURVEY

Algorithms/Guides & Medical Forms

Welcome and thank you for participating in this brief survey to validate the effectiveness of the following comprehensive interactive algorithms/guides as they relate to my Doctor of Nursing Practice (DNP) scholarly project. The idea behind this DNP scholarly project was to develop a standardized algorithm/guide to address and overcome barriers faced by the population, aged 65 years and older, particularly in the realm of mental health, nutrition, and physical fitness in order to facilitate optimal patient care in pandemic environments such as those created by COVID-19 now and in the future. Greatly appreciate your time in careful consideration of the capability of these algorithms/guides and medical forms to capture critical data impacting health along the care continuum for patients aged 65 and older. By completing this survey, your consent to participate is implied.

1. What is your current professional title?

- Medical Doctor
- Doctor of Osteopathy
- Nurse Practitioner
- Physician Assistant
- Other (please specify)

2. Number of years working in your current profession?

- 0-1
- 2-4
- 5-9
- 10+

3. In what healthcare setting do you practice?

- Hospital (Inpatient)
- Hospital (Clinic)
- Other (please specify)

_____

4. What is the age group of your primary patient population?

- 18-34
- 35-54
- 55-64
- 65+

5. What is your gender?

- Female
- Male
- Non-Binary
- Other
- Choose not to disclose

6. Algorithms/Guides (reference e-mail attached files)

COMPREHENSIVE / INTERACTIVE RESOURCE GUIDE

CHOOSE YOUR PATH ALGORITHMS / GUIDES FOR ASSESSMENT OF PATIENTS 65 YEARS AND OLDER

Comprehensive / Interactive Resource Guide Instructions

The algorithms/guides included in this comprehensive/interactive resource are to help identify barriers during pandemics in the older adult population particularly those aged 65 and older. The algorithms/guides enable quick referral reference during compressed time visits with the primary care manager (PCM). The provider may choose to do only one or all of the algorithms/guides depending on reason for visit.

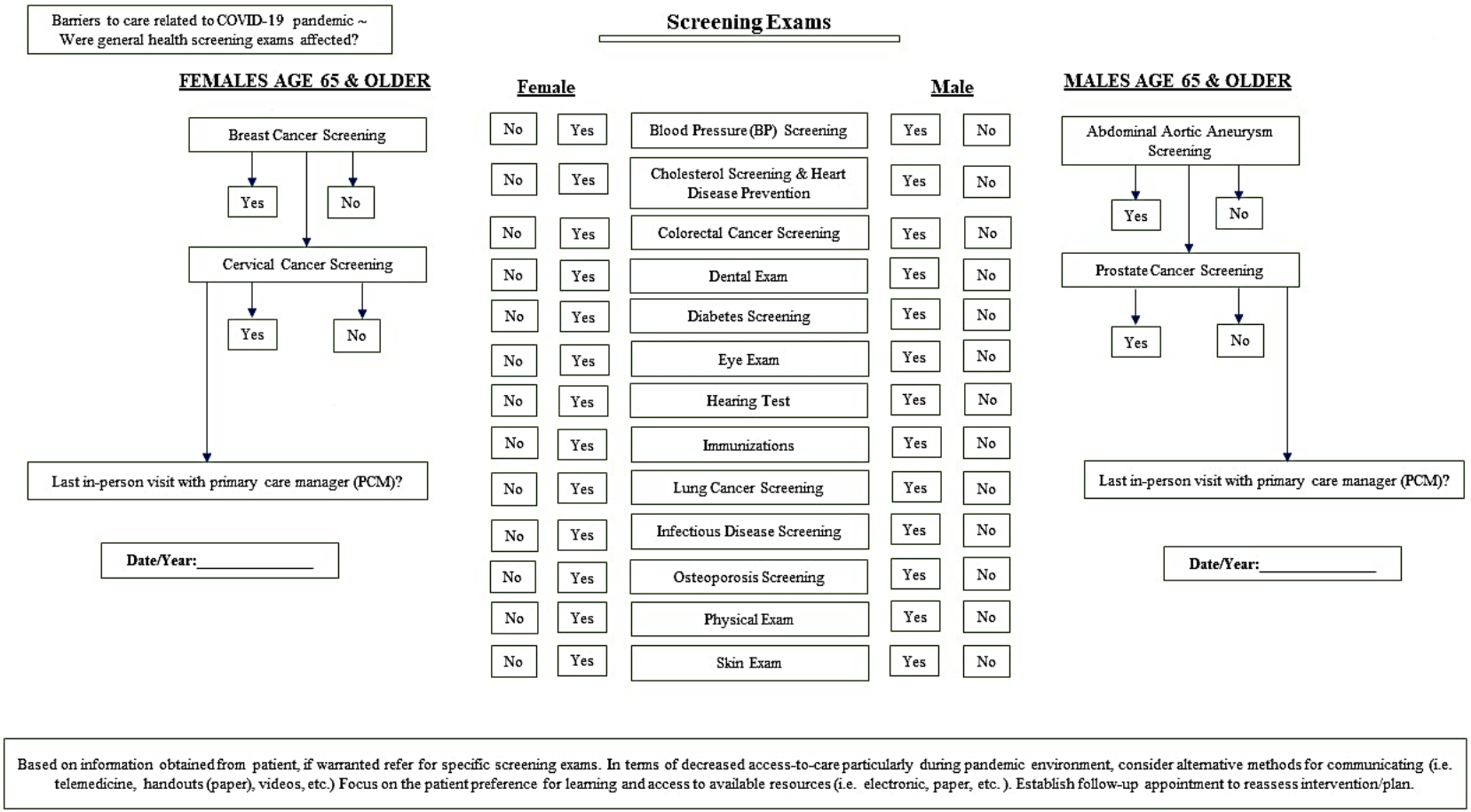
Algorithm/Guide Instructions

COMPREHENSIVE / INTERACTIVE RESOURCE GUIDE

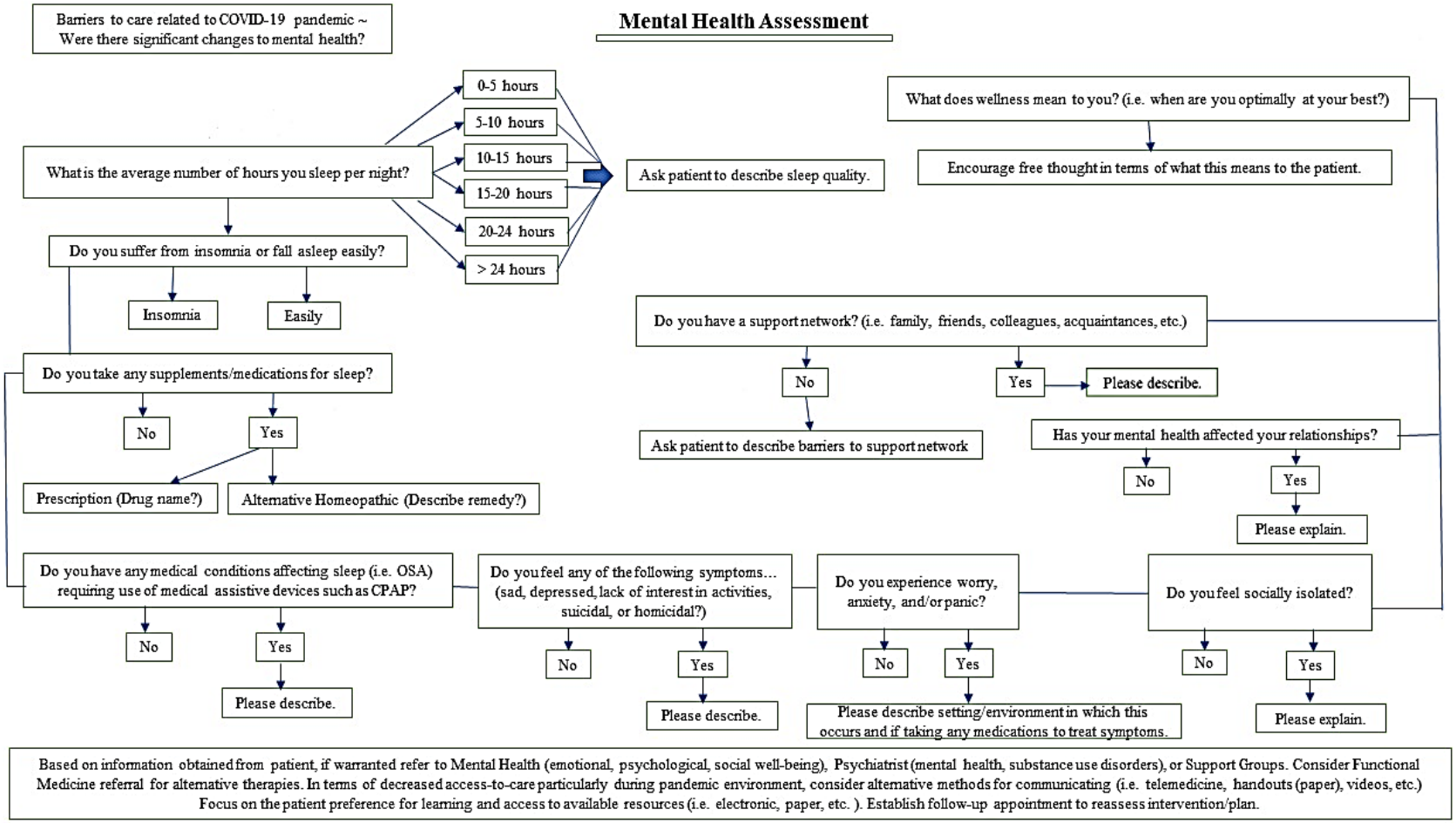
CHOOSE YOUR PATH ALGORITHMS / GUIDES FOR ASSESSMENT OF PATIENTS 65 YEARS AND OLDER

1. **General – Screening Exams**
   - ❖ Algorithm – 1 (Quick Referral Reference)
   - ❖ Medical Form Template – 1 (Extended Appointment Details)
2. **Mental Health Focus Exam**
   - ❖ Algorithm – 4 (Quick Referral Reference)
   - ❖ Medical Form Template – 4 (Extended Appointment Details)
3. **Nutrition Focus Exam**
   - ❖ Algorithm – 2 (Quick Referral Reference)
   - ❖ Medical Form Template – 2 (Extended Appointment Details)
4. **Physical Activity Focus Exam**
   - ❖ Algorithm – 3 (Quick Referral Reference)
   - ❖ Medical Form Template – 3 (Extended Appointment Details)

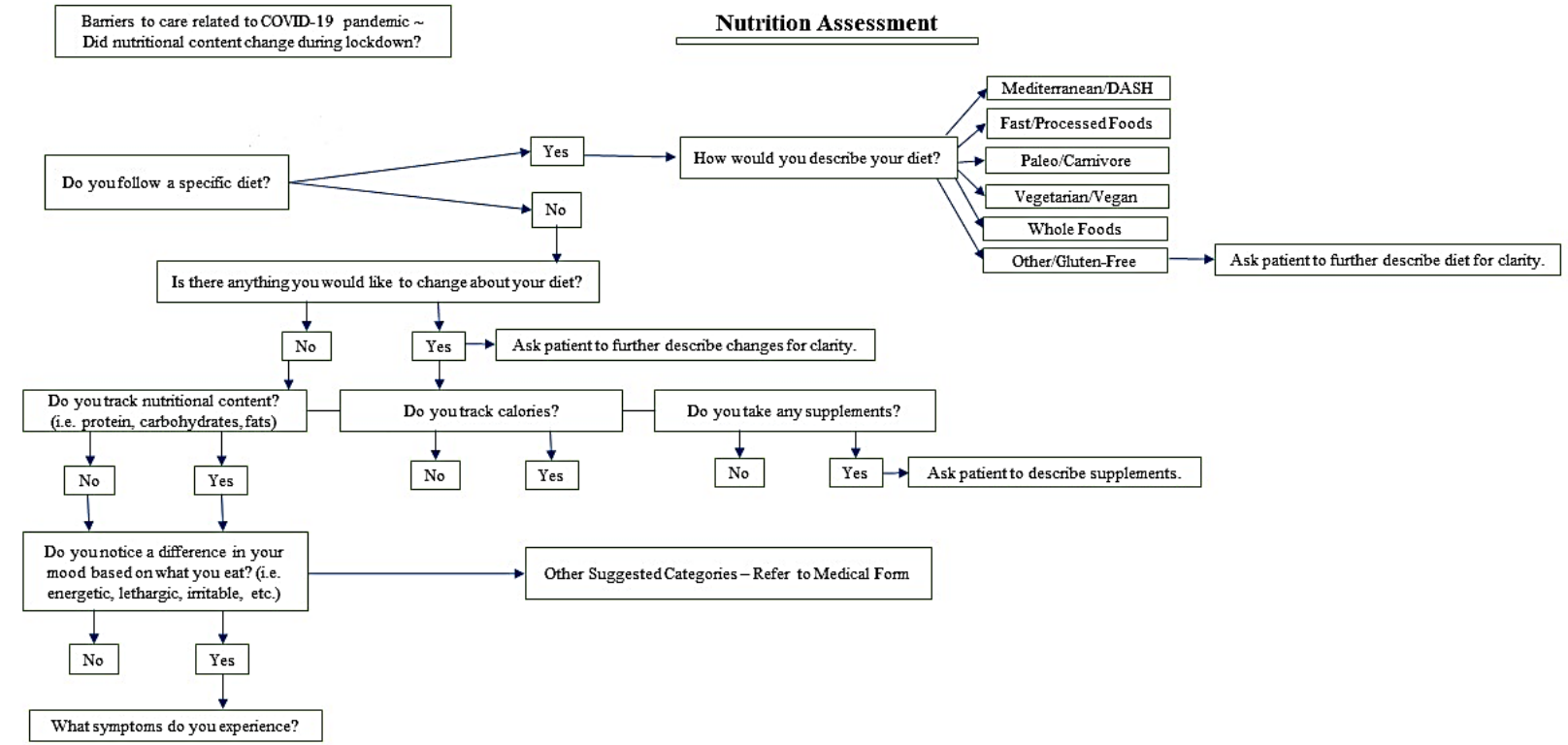
Algorithm/Guide Outline



General Screening Exams

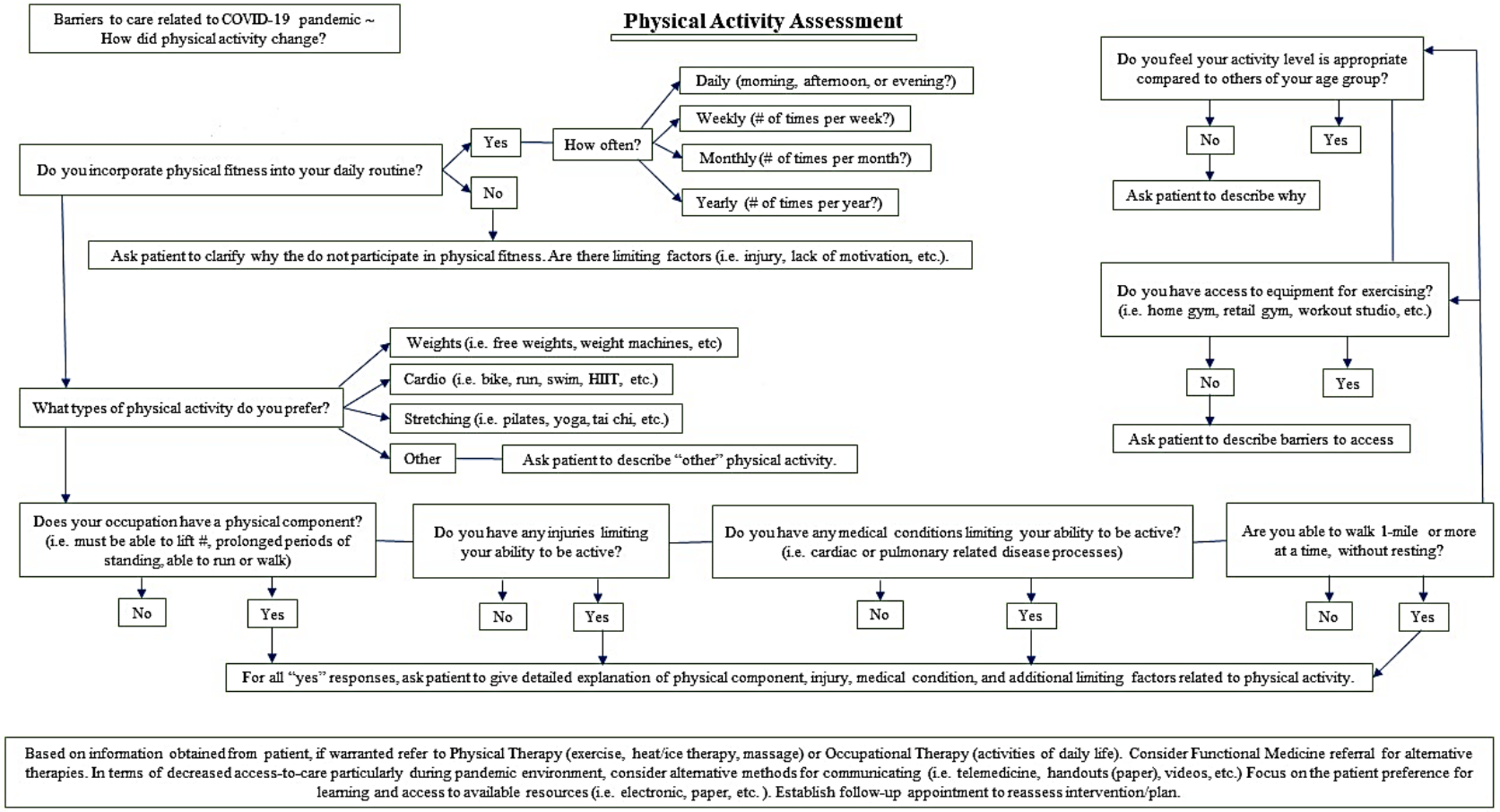


Mental Health Assessment



Based on information obtained from patient, if warranted refer to Registered Dietitian (complex analysis of nutritional gaps), Allergist (abnormal reactions not otherwise treated by diet changes) or Speech/Pathology (aspiration/dysphagia associated eating complications). Consider Functional Medicine referral for alternative therapies. In terms of decreased access-to-care particularly during pandemic environment, consider alternative methods for communicating (i.e. telemedicine, handouts (paper), videos, etc.) Focus on the patient preference for learning and access to available resources (i.e. electronic, paper, etc.). Establish follow-up appointment to reassess intervention/plan.

Nutrition Assessment



Physical Activity Assessment

7. Medical Forms

COMPREHENSIVE / INTERACTIVE RESOURCE GUIDE INSTRUCTIONS

The algorithms/guides included in this comprehensive/interactive resource are to help identify barriers during pandemics in the older adult population particularly those aged 65 and older. These medical form templates mirror each algorithm/guide and allow for extended written details pertaining to the older adult patient appointment. Additionally, a compilation form at the end can be used to compile individual summaries as they pertain to the preventative health screen in terms of mental health, nutrition, and physical activity. The algorithms/guides enable quick referral reference during compressed time visits with the primary care manager (PCM). The provider may choose to do only one or all of the algorithms/guides depending on reason for visit.

Medical Form Instructions

GENERAL SCREENING EXAMS

Blood Pressure (BP)	**Notes:**
Cholesterol & Heart Disease Prevention / Screening	**Notes:**
Colorectal Cancer Screening	**Notes:**
Dental Exam	**Notes:**
Diabetes Screening	**Notes:**
Eye Exam	**Notes:**
Hearing Test	**Notes:**
Immunizations (Current / Non-current)	**Notes:**
Lung Cancer Screening	**Notes:**
Infectious Disease Screening	**Notes:**
Osteoporosis Screening	**Notes:**
Physical Exam	**Notes:**
Skin Exam	**Notes:**

FEMALES AGE 65 & OLDER	
Breast Cancer Screening	**Notes:**
Cervical Cancer Screening	**Notes:**
Last in-person visit with primary care manager (PCM)	**Notes:**

MALES AGE 65 & OLDER	
Abdominal Aortic Aneurysm Screening	**Notes:**
Prostate Cancer Screening	**Notes:**
Last in-person visit with primary care manager (PCM)	**Notes:**

General Screening Exams

MENTAL HEALTH ASSESSMENT INTAKE FORM

What is the average number of hours the patient sleeps each night? Clarify sleep quality.	**Notes:**
Does the patient suffer from insomnia?	**Notes:**
Does the patient take any supplements / medication for sleep? If so, please describe. List supplements and medications.	**Notes:**
Does the patient have any medical conditions affecting sleep (i.e. OSA) requiring use of medical assistive device such as CPAP? If so, list CPAP settings.	**Notes:**
Does the patient feel or exhibit any of the following: sad, depressed, lack of interest in activities, suicidal, or homicidal? If so, requires further referral.	**Notes:**
Does the patient experience or exhibit any of the following: worry, anxiety, or panic? If so, requires further referral	**Notes:**
Does the patient feel socially isolated? Particularly of concern during pandemic environment.	**Notes:**
Has the patient's current mental health affected their relationships? Negatively or Positively?	**Notes:**
Does the patient have an active support network? (i.e family, friends, colleagues, acquaintances, etc)	**Notes:**
What does the term "wellness" mean to the patient? (i.e. when are they optimally at their best?)	**Notes:**
Additional Notes from Mental Health Assessment Algorithm:	

Mental Health Assessment

NUTRITIONAL ASSESSMENT INTAKE FORM

Does the patient follow a specific diet? If so, please list additional details provided.	**Notes:**
Is there anything specific the patient would change about their diet?	**Notes:**
Does the patient track nutritional content? (i.e. protein, carbohydrates, fats)	**Notes:**
Does the patient track calories?	**Notes:**
Does the patient take any supplements? If so, please list supplements.	**Notes:**
Does the patient notice a difference in their mood based on what they eat? (i.e. energetic, lethargic, irritable, etc) If so, please describe symptoms.	**Notes:**
Is the patient allergic to any specific food categories? If so, please list.	**Notes:**
Does the patient avoid certain foods based on medications they are taking? If so, please describe.	**Notes:**
Has the patient experiences any difficulty swallowing or aspiration associated with food intake? If so, when?	**Notes:**
Food Scarcity: Are there any foods unavailable to the patient? (i.e. resources unavailable, cost factors, environment concerns, etc)	**Notes:**
Additional Notes from Nutrition Assessment Algorithm:	

PHYSICAL ACTIVITY ASSESSMENT INTAKE FORM

Does the patient incorporate physical fitness into their daily routine? If so, please describe.	**Notes:**
If the patient does not participate in physical fitness, what are the limiting factors?	**Notes:**
Does the patient have a preference for a particular activity? If so, please describe.	**Notes:**
Does the patient's occupation require a physical component? (i.e. must be able to lift #, prolonged periods of standing, able to run or walk) If so, please describe.	**Notes:**
Does the patient currently have an active injury interfering with their mobility? If so, please describe.	**Notes:**
Are there any additional medical conditions limiting the patient's ability to be active? (i.e. cardiac or pulmonary related disease processes)	**Notes:**
Is the patient able to walk 1-mile or more at a time without resting?	**Notes:**
Does the patient have access to equipment for exercising? (i.e. home gym, retail gym, workout studio, etc.) If so, please describe.	**Notes:**
Does the patient feel their activity level is comparable to their peers? (i.e same age group)	**Notes:**
Additional Notes from Physical Fitness Assessment Algorithm:	

Physical Activity Assessment

COMPILATION NOTES

Medical Forms Compilation

*** 8. Please review the content of the algorithms/guides and medical form questions. Would you consider the content valid and in line with current practice?**

- Yes
- No
- Comments (i.e. if above answer is no, please specify why)

*** 9. Are the questions appropriate for someone aged 65 or older?**

- Yes
- No
- Comments - (i.e if above answer is no, please specify why)

*** 10. Do you feel it would be advantageous to have the algorithms/guides digitalized in the setting of an electronic health record (EHR)?**

- Yes
- No
- Comments - (i.e. if above answer is no, please specify why)

*** 11. Would you use these algorithms/guides and medical forms in your practice?**

- Yes
- No
- Comments - (i.e. if above answer is no, please specify why)

12. Do you have any suggestions to make the algorithms/guides more applicable to practice or user friendly? Is there anything else you would like to add for feedback comments as it relates to the algorithms/guides?

APPENDIX D

HEALTHCARE DELIVERY INTERVENTION

COMPREHENSIVE / INTERACTIVE RESOURCE GUIDE

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MEDICAL FORMS

Table of Contents

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FEMALES AGE 65 & OLDER

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MALES AGE 65 & OLDER

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Additional Notes from Physical Fitness Assessment Algorithm:

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Additional Notes from Mental Health
Assessment Algorithm:

COMPILATION NOTES