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Advance Care Planning Protocols and Hospitalization, Rehospitalization, and Emergency Department Use in Home Health

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Advance Care Planning Protocols and Hospitalization, Rehospitalization, and Emergency Department Use in Home Health

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ABSTRACT

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Aim. The aim of this study was to examine the relationship of advance care planning protocols with hospitalization, rehospitalization, and emergency department use rates in U. S. home health agencies (HHA).

Background. Since 2003, the Centers for Medicare and Medicaid Services (CMS) have required HHAs to report on quality outcomes such as hospitalization, rehospitalization, and emergency department use rates, made publicly available online. Advance care planning (ACP) is a conversation about beliefs, goals, values, future treatment choices, and designation of a surrogate decision-maker, that someone has in advance of a health crisis. Most existing studies on ACP have taken place outside of HHAs among populations with serious illnesses such as HIV/AIDS, cancer, dementia, and end stage renal disease. Meanwhile, the U.S. home health population is living longer with chronic conditions such as pulmonary and cardiovascular illnesses. Effective January 1, 2016, the Center for Medicare and Medicaid Innovation implemented the Home Health Value-Based Purchasing (HHVBP) Model among home health agencies (HHAs) in nine states representing each geographic region in the United States. Agencies in these states began competing on value in the HHVBP model, and reimbursement rates began to be tied to quality performance (innovation.cms.gov). As part of HHVBP, CMS implemented an additional

process-level mandate requiring them to report on ACP, though this data is not publicly available. It is currently unknown how ACP protocols in HHAs may affect agencies' overall rates of acute care services use.

Methods. Electronic surveys about ACP protocols were distributed to HHAs. Existing data about demographics, diagnoses, hospitalization, rehospitalization, and ED use were accessed online via CMS websites. Descriptive and regression analyses were conducted using the electronic survey results and the existing data.

Results. Associations between the variables were observed and compared to the hypotheses. Statistical significance was found in the relationship between ACP protocols and hospitalization, where one increased the other increased. Several trends were found: Agencies with increased total percentage of cardiac and pulmonary diagnoses tended to have increased hospitalization rates; agencies with increased average age of patients tended to have increased ACPP scores; and agencies with increased proportion of Black patients tended to have higher hospitalization rates.

DEDICATION

I dedicate my dissertation work to my family.

To my mother Ele and father Milt, thank you for your love and support always.

To my husband, William, thank you for your patience, understanding, and solidarity. Here's to many more study dates. I love you.

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Chapter 1. Introduction

The purpose of this study was to examine the relationship of advance care planning protocols with hospitalization, rehospitalization, and emergency department use rates among Medicare beneficiaries receiving home health services in the United States. An overview of the problem, background information, introduction to the idea, statement of the problem, purpose of the study, theoretical framework, hypotheses, conceptual and operational definitions, limitations and delimitations, assumptions, and significance of the study are detailed in this chapter.

With the growing population of older adults, advances in medical technology, and concerns about quality of life for those approaching death, the Institute of Medicine published *Dying in America: Improving quality and honoring individual preferences near the end of life* (IOM, 2015), a document calling for new protocols and systems to address dying and death. Consistent with this, Hash et al. (2016) rightly noted that "the end of life is no longer an abrupt event but is instead characterized by a sometimes lengthy state of chronic illness" (p. 365). While medical advancements may be laudable, they can be problematic if including treatments and tests that are non-beneficial in the last six months of life (Cordona-Morrell et al., 2016). The problem is that if a patient receiving home health services is not given the opportunity to express their wishes regarding future medical treatment, events such as hospitalization, rehospitalization, and emergency department visits for aggressive measures may occur without attention to the patient's goals of care. One method to prevent the provision of unwanted treatment is advance care planning (ACP). While ACP can occur in any environment, it is specifically included as part of an innovative program by CMS called Home Health Value Based Purchasing.

Home Health Value Based Purchasing

In 2016, the Center for Medicare and Medicaid Innovation (CMMI) of the Centers for Medicare and Medicaid Services (CMS) began a program called Home Health Value Based Purchasing (HHVBP), mandatory in all Medicare-participating HHAs in 9 randomly selected, regionally diverse states. The program required agencies to report to CMS on measures comprising a Total Performance Score (TPS), and in 2018 the CMS reimbursement rates to these HHAs began to be increased or decreased based on their scores. The purpose of HHVPB was to "test the impact of providing financial incentives to HHAs for improvements in quality of care" (Arbor Research Collaborative, 2020, p. 2). There were four measure domains: Utilization, Medicare spending, quality measures, and patient experience. These included such items as acute care services use, improvements in activities of daily living (ADLs), improvement in pain and dyspnea, and patient satisfaction, for example. All of these were publicly reported in various CMS databases. In addition, three process measures were included as self-reports and not publicly reported– two vaccination measures and one called Advance Care Plan.

The advance care plan measure "reflects the percentage of patients aged 65 years and older who have an advance care plan or surrogate decision maker documented in the medical record or documentation in the medical record that an advance care plan was discussed but the patient did not wish or was not able to name a surrogate decision maker or provide an advance care plan" (Arbor Research Collaborative, 2020, p. 123). The Medicare Learning Network (2019) published a downloadable fact sheet on advance care planning describing voluntary ACP as "a face-to-face service between a Medicare physician (or other qualified health care professional) and a patient to discuss the patient's health care wishes if they become unable to make decisions about their care. As part of this discussion, the provider may talk about advance

directives with or without completing relevant legal forms" (p.2). Included in this fact sheet was a table of online resources regarding advance care planning. Beyond this, HHAs in HHVBPs were expected to find their own resources to develop protocols on advance care planning and/or to access the HHVPB portal via CMS.

There are many models of ACP that HHAs may use the development of protocols (Centers for Disease Control and Prevention, 2020). Respecting Choices ® (RC) is one model of ACP (Gundersen, 2019) and was chosen for this study for several reasons: (1) It was one of the first models to shift the locus of these conversations out of the hospital and away from physicians toward community and family, where home health is located; (2) it has been shown to have high patient-surrogate congruency; and (3) a Delphi survey of palliative care experts gave a definition similar to the one used in this model (MacKenzie et al., 2018; Sudore et al., 2017). According to the RC model's definition, ACP is appropriate for all adults, not just for those with terminal or serious illnesses. For the purposes of this study, ACP is defined as a conversation held in advance of a medical crisis with a loved one and/or a health care provider about their goals of care (GOC); values; preferences for future medical treatments; and choice of a surrogate decision-maker to speak for them in the potential case that they cannot speak for themselves (Hammes & Briggs, 2011). For these conversations, surrogate decision-makers may or may not be present. One benefit of including the designated potential decision-maker in an ACP conversation prior to hospital admission is that it has been linked with lower decisional conflict among decision-makers in the acute care setting (Chiarchiaro et al., 2015). Although surrogates have been found to either facilitate or impede engagement in ACP, the eliciting of surrogates' perspectives is key to ACP because patients and relatives are an intertwined unit (Fried et al., 2018; Fried et al., 2017; Thoresen & Lillemoen, 2016); and ultimately, surrogates may be called

upon to communicate the patient's treatment wishes. In the long-term care (LTC) setting, one study found that family involvement in ACP was significant to providers' understanding of what was important in patients' lives (i.e., how they would self-define quality of life); in addition, families were found to share the experiences of dying and death (Thoresen & Lillemoen, 2016). In the home health (HH) setting, ACP conversations can inform patients, families, and providers about (a) what kinds of treatments patients want in the home and (b) whether patients want to return to the hospital for higher levels of care (Bigger & Haddad, 2019). ACP protocols are important because they are system-level initiatives that can provide a consistent approach by the interprofessional team through training and documentation.

While some may assert it is the role of physicians to initiate ACP, most patients are served by an interprofessional healthcare team that is supposed to tailor plans of care to patient goals (Nedjat-Haiem et al., 2017). Some studies have been published on the nurse's role in ACP, though some HH patients may never be visited by a nurse (Sinclair et al., 2017). Instead, patients may be visited by other disciplines such as occupational therapists, physical therapists, and/or speech therapists. Hence, the onus is upon the entire interprofessional team, not just the nurse or physician, to be aware of patient-specific goals of care. A term that has been used for ACP is goals-of-care (GOC) discussion, because both terms involve team members inquiring into the patient's wishes in designing the plan of care (You et al., 2017). Since the team is responsible for such conversations, it follows that the onus is upon the HHA to establish protocols to support the team in this effort.

ACP is a conversation about a patient's goals of care, values, preferences for future health care treatments, and designation of a surrogate decision-maker. These may be recorded in a written advance directive (AD), though the AD is only one part of ACP (Hammes & Briggs,

2011)and according to CMS is not required for the ACP process measure. The following is a discussion of the background on ACP and hospitalization, rehospitalization, and ED use in home health.

Background

Since 2003, all Medicare-certified HHAs have been mandated to report on quality performance information such as hospitalization, rehospitalization, and ED use (CMS, 2019). These outcome measures are considered to be indicators of poor-quality home health care since they are associated with poorer health outcomes and higher payer costs (Wang et al., 2016). These events are reported by HH clinicians via the Outcome and Assessment Information Set (OASIS) and submitted to the Centers for Medicare and Medicaid (CMS), who then make them publicly available through the Home Health Compare website (medicare.gov/HHCompare/Home.asp).

Effective January 1, 2016, the Center for Medicare and Medicaid Innovation implemented the Home Health Value-Based Purchasing (HHVBP) Model among home health agencies (HHAs) in nine randomly-selected states representing each geographic area in the United States. All Medicare-certified HHAs providing services in Arizona, Florida, Iowa, Maryland, Massachusetts, Nebraska, North Carolina, Tennessee, and Washington, began competing on value in the HHVBP model, when reimbursement rates began to be tied to quality performance on specific outcome measures (innovation.cms.gov) (Appendix A). In addition to the universal CMS mandate to report on outcome measures of hospitalization, rehospitalization, and emergency department use rates, data which is publicly available, in 2016 CMS added a process-level mandate for HHAs in the 9 HHVBP states to report to CMS on ACP, though this

data has not been made publicly available. Further, it is unknown whether HHAs in the non-HHVBP states have ACP protocols.

In the United States, the rate of people living with chronic diseases, such as cardiovascular and lung illnesses, is growing (Raghupathi & Raghupathi, 2018). This population includes those receiving HH services (Bigger & Haddad, 2019). For example, in the U. S. the top ten diagnoses in HH between October 2015 and March of 2016 showed the prevalence of chronic pulmonary and cardiovascular diseases in the HH population. Essential hypertension was listed as second at 1.9 million cases; heart failure was listed as fourth at 1.4 million cases; type II diabetes mellitus, an endocrine disorder associated with cardiovascular disease, ranked fifth at 1.8 million cases; aftercare following surgery on the circulatory system was listed as eighth at 667,498 cases; and atrial fibrillation ranked ninth at 675, 715 cases (Fazzi & Associates, 2018). Chronic obstructive pulmonary disease was listed as sixth (acute COPD) and seventh (unspecified COPD), totaling 1.8 million cases in that time frame (Fazzi Associates, 2018). Together, pulmonary and cardiovascular diseases have comprised the majority of home health diagnoses (Fazzi & Associates, 2018). Though COPD and CHF are chronic and terminal, these diseases are not always perceived as serious illnesses with imminent death, so they provide a context for ACP that is distinct from the diagnostic contexts of HIV, cancer, end-stage renal disease, or dementia.

Table 1

Top 10 Home Health Diagnoses in the United States, October 2015-March 2016

Rank	**Diagnosis**	**Visits**
1	Aftercare following joint replacement surgery	2,045,226
2	Essential (primary) hypertension	1,911,155
3	Muscle Weakness (generalized)	1,735,006
4	Heart failure, unspecified	1,461,518
5	Type 2 diabetes mellitus without complications	1,824,782

6	Chronic obstructive pulmonary disease with (acute) exacerbation	1,129,763
7	Chronic obstructive pulmonary disease, unspecified	780,395
8	Aftercare following surgery on the circulatory system	667,498
9	Unspecified atrial fibrillation	675,715
10	Urinary tract infection, site not specified	717,158

(Fazzi & Associates, 2018)

Home health care is the largest long-term modality for older adults in the United States and is the fastest-growing healthcare setting in the country (Wang et al., 2016). The home health care setting is distinct from the general community setting in that patients must possess a skilled need to qualify for services (medicare.gov). HH is further unique in that it involves a series of visits over a period of time, in which the non-physician interprofessional team visits the patient at home where family may be present. The HH interprofessional team can include the disciplines of skilled nursing, occupational therapy, physical therapy, speech therapy, and social work. Some HH patients may never see a nurse at home because they do not require skilled nursing care. HH professionals are not always simultaneously present in the home; thus, they may be present to an evolving conversation with the patient and family (Bigger & Haddad, 2019). What is integral to home health is the goal of managing skilled needs at home and minimizing or preventing hospitalization, rehospitalization, and emergency department (ED) use. The HH setting is distinct from all other healthcare environments (Bigger & Haddad, 2019).

Some research has been published about predictors of hospitalization, rehospitalization, and emergency department use among home health patients. Much research has been published about advance care planning (ACP). However, most studies have been conducted in public/community settings, acute care, and outpatient clinics. Studies have indicated ACP's effects on outcomes such as enhancement of autonomy in decision-making, achievement of the preferred place of death, less invasive and costly treatments, relieving family anxiety, reducing

futile interventions, reducing inappropriate hospital admissions, and improved quality of end-of-life care (Russell & Detering, 2018). However, there is a dearth of literature on ACP protocols in the HH setting and minimal literature on hospitalization, rehospitalization, and ED use in home health (Bigger & Haddad, 2019). Given the IOM's (2015) call for new protocols and processes regarding dying and death, and given the HHVBP model's imperative for HHAs in 9 states to report on ACP, HH interprofessional team members need evidence unique to their setting. For these reasons, the time is ripe to study the relationship between ACP and HH quality outcome measures.

Donabedian's (1966) Structure-Process-Outcome model has been used throughout various healthcare settings to measure quality improvement. In this model, structural measures such as agency characteristics or protocols affect processes, or the way the team delivers care. Structures and processes in turn affect outcomes such as hospital admissions. The Donabedian model was chosen as a framework for the present study and is discussed further in this chapter and Chapters 2 and 3.

Statement of the Problem

If a patient receiving home health services is not given the advance opportunity to express their wishes regarding future medical treatment, events such as hospitalization, rehospitalization, and emergency department visits may occur and provide aggressive measures without consideration of the patient's goals of care. If there is no systematized approach to ACP, the HH interprofessional team may not be capable, confident, or competent to engage patients and families in these conversations. The problem is that it is unknown if there is any relationship between ACP protocols and hospitalization, rehospitalization, and emergency department use rates in HH.

Purpose of the Study

The purpose of the study was to identify the relationship between ACP protocols in HH and hospitalization, rehospitalization, and ED use rates. The study also proposed to identify demographic and diagnostic factors associated with hospitalization, rehospitalization, and ED use rates.

Specific Aims and Hypotheses

The specific aims and hypotheses follow.

Specific Aim I: To determine if advance care planning protocols (ACPP) and total percentage of cardiac and pulmonary diagnoses (TPCP) are correlated with increased acute care hospital services use rates.

H1. Higher ACPP scores are correlated with lower hospitalization rates.

H2. Higher ACPP scores are correlated with lower rehospitalization rates.

H3. Higher ACPP scores are correlated with lower ED use rates (without hospitalization).

H4. HHAs in HHVBP states have higher ACPP scores

H5. Higher TPCP scores are correlated with higher hospitalization rates, higher rehospitalization rates, and higher ED use rates without hospitalization.

Specific Aim II: To determine whether the demographic and diagnostic profiles of the HHAs are correlated with ACPP and acute care services use (WACSUR: weighted acute care services use rates score).

H6. HHAs with higher average patient ages will have higher ACPP scores and higher WACSUR scores.

H7. HHAs with higher proportions of Black patients will have lower ACPP scores and lower WACSUR scores.

H8. HHAs in the Northeast region will have higher ACPP scores and higher WACSUR scores.

H9. For-profit HHAs will have higher ACPP scores and lower WACSUR scores.

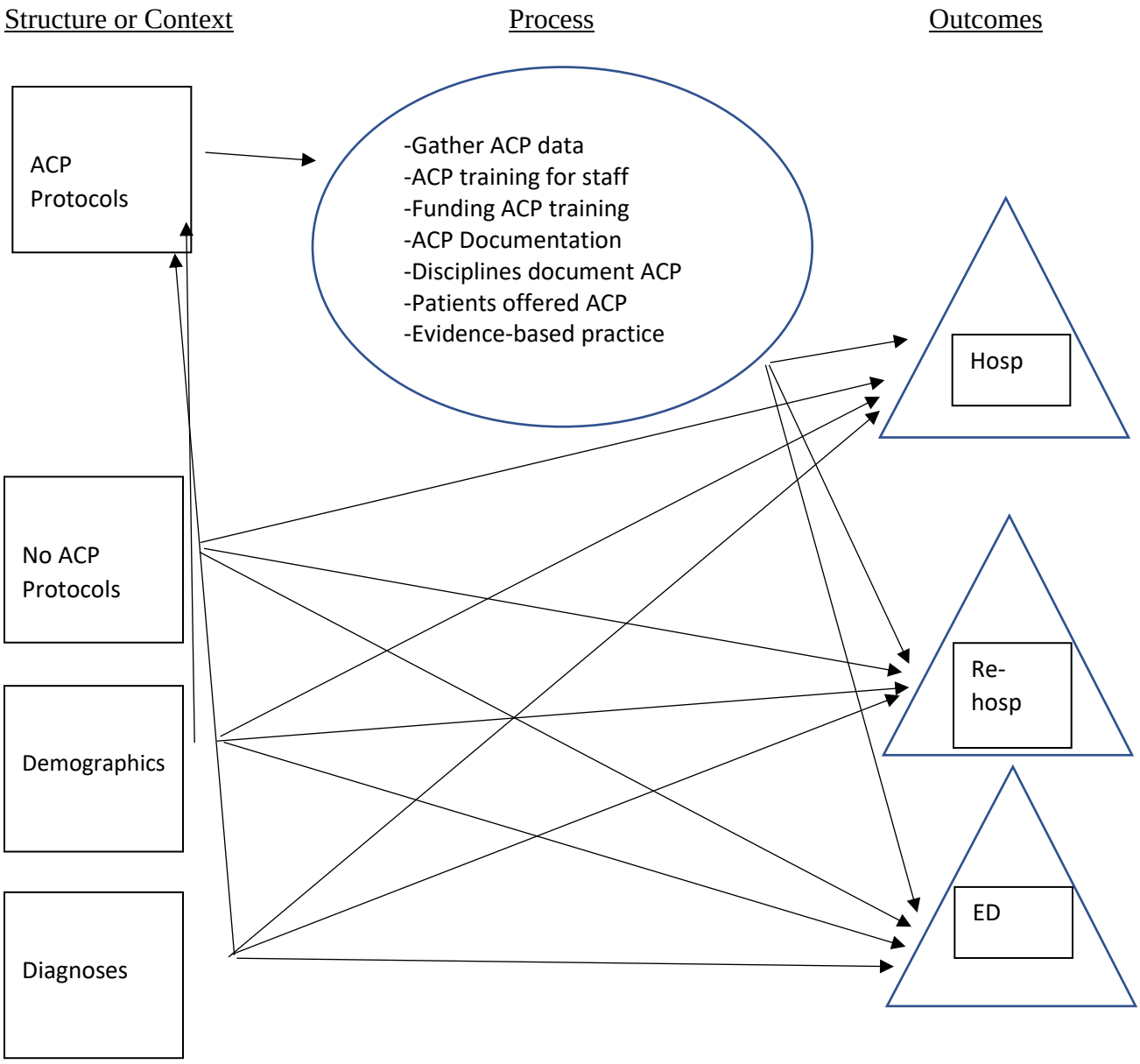
H10. HHAs with higher TPCP scores have lower ACPP scores.

Conceptual Model

The conceptual model appearing in Figure 1 was created for this study. Structural factors include the presence or absence of ACP protocols. Contextual factors operate at the same level as structural factors because they describe factors normally considered to be out of the organization's locus of control but nonetheless affecting organizational characteristics (Oostendorp et al., 2020). For example, according to the World Health Organization (WHO, 2001), context indicators "together constitute the complete context of an individual's life and living, and in particular the background of an individual's health and health-related states." For the purposes of this study, the contextual factors of demographics and diagnoses were considered at the agency level, not the individual level. Process factors included the attributes of ACP protocols. Outcome factors include agency-level rates of hospitalization (hosp), rehospitalization (rehosp) and emergency department (ED) use.

Figure 1

Conceptual Model



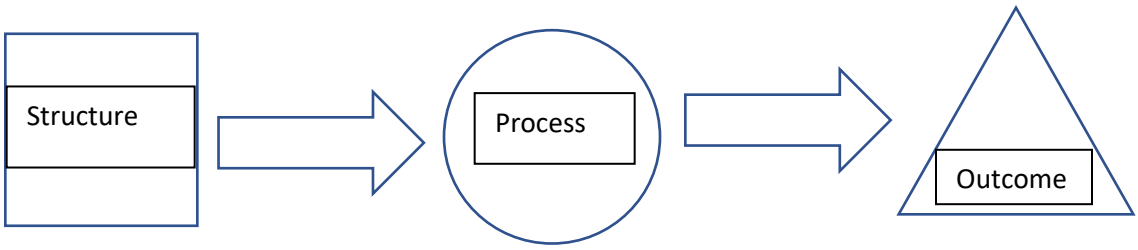
Theoretical Framework

The structure-process-outcome (SPO) theory proposed by Donabedian (1966) suggests that healthcare quality outcomes are associated with structural variables and processes of care. That is, according to the theory, improvements in the structure of care lead to improvements in

clinical processes that in turn improve patient outcomes (Moore et al., 2015), although cause-and-effect relationships are often quite complex. Structural factors reflect organizational characteristics and attributes of the service provider: They are also known as input measures. Process measures reflect how systems and processes work, focusing on the way that care is delivered to patients. Outcome measures reflect the impact on patients and populations (Act Academy, 2020). The researcher's depiction of the SPO model appears in Figure 2. The SPO theoretical framework was chosen for this study because the presence or absence of ACP protocols can be considered as agency structure; the attributes of ACP protocols can be considered as process; and hospitalization, rehospitalization, and ED use can be considered as outcomes. The model was then modified for this study to include the structural level factors of context, which include demographics and diagnoses.

Figure 2

Theoretical Model: Donabedian's Structure-Process-Outcome Model



Conceptual Definition of Terms

Advance Care Planning: Respecting Choices ® is one model of ACP (Gundersen, 2019). According to this model, ACP is appropriate for all adults, not just those with serious or terminal illnesses. For the purposes of this study, advance care planning (ACP) is defined as a conversation about beliefs, goals, values, future treatment choices, and designation of a surrogate decision-maker, that someone has in advance of a health crisis (Hammes & Briggs, 2011).

ACP Protocol: written policies, procedures, or protocols that are established by agencies and applicable agency-wide to inform staff of expectations regarding their engagement in ACP.

Advance Directive: Written documents such as living wills or health care powers of attorney specify, consistent with applicable state law, how individuals want medical decisions to be made for them should they become unable to communicate their wishes (USGAO, 2015).

Agent or Surrogate Decision-Maker: a person identified to speak on behalf of a patient without decisional capacity.

Living Will: This is a document specifying what medical treatments a person would or would not want in the case that they could not speak for themselves.

Health Care Power of Attorney: An HPOA is a document that identifies a health care agent as decision maker for the patient, and under state law, typically becomes operative when a patient is medically determined as unable to make decisions (USGAO, 2015).

Goals of Care Conversation: Although the term can be used in a narrow sense, referring specifically to discussions about resuscitation preferences among hospitalized patients, LeBlanc and Tulsky (2018) suggest a broader definition adopted here that includes decisions about specific treatments, the intensity of care, and planning for future care needs.

Home Health**:** Home health care includes a wide range of health care services that can be given at a person's home for an illness or injury. For this study, Home Health (HH) and Home Health Agencies (HHAs) refer to those agencies that receive reimbursement from the Centers for Medicare and Medicaid (CMS). In order to qualify for reimbursement from CMS for home health services, a patient must be under the care of a physician and must be receiving services under a plan of care created and reviewed regularly by a physician. The physician must certify that the person needs one or more of the following: Intermittent skilled nursing care (other than

drawing blood); Physical therapy, speech-language pathology, or continued occupational therapy services. To be eligible, either: 1) the person's condition must be expected to improve in a reasonable and generally predictable period of time, or 2) the person needs a skilled therapist to safely and effectively make a maintenance program, or 3) the person needs a skilled therapist to safely and effectively do maintenance therapy for their condition. A physician must certify that the person is homebound, meaning that they may leave home for medical treatment or short, infrequent absences for non-medical reasons, like attending religious services (medicare.gov).

Operational Definition of Terms

Advance Care Planning Protocol (ACPP) was measured by items on an electronic survey (Appendix A). Specifically, the structural level of ACPP was measured by the self-reports of the presence of written policies, procedures, or protocols on ACP. The process level of ACPP was measured by survey items including self-reports of the following: the agency gathering data on ACP; the percentage of staff having undertaken training on ACP; whether ACP training was funded by the agency; the provision of a format for the team to formally document patients' wishes for future care in the health record; the number of disciplines that have access to a format to document ACP discussions; the proportion of patients to which ACP is provided; and whether the ACP protocol was based on an existing framework.

Hospitalization was measured by two OASIS items in the CMS database. "Acute Care Hospitalization (ACH)" will be used for any HH patient reported as being hospitalized during the first 60 days of a HH stay.

Rehospitalization was defined by the OASIS item indicating admission to and discharge from an acute care hospital during the HH stay; and if the time between the prior hospital discharge and following admission was within 30 days.

Emergency Department (ED) Use was measured by the OASIS item in the CMS database called “Emergency Department (ED) Use without Hospitalization” for any HH patient reported as having presented at an emergency department during the first 60 days of a HH stay without being admitted to a hospital.

Assumptions

Some basic assumptions underlie the research. First, it was assumed that a sample of 9 HHVBP states and 9 non-HHVBP states represents the larger HHA population and would allow for generalization. Next, HHA respondents would understand the definition of ACP as listed at the top of the survey. Lastly, HHAs would report honestly to the electronic survey questions.

Limitations

There were some notable limitations to this study. Without access to patient-level data, this study relied on aggregate data provided by HHAs to CMS and to the researcher. Therefore, the study outcomes were limited to hospitalization, rehospitalization, and ED use events that were identified and documented by clinicians in OASIS. This study also relied on self-reported data collected by the researcher using a tool that had not undergone psychometric testing. Survey results were based on HHA respondents’ understanding of agency protocols regarding ACP. Further, answering whether the agency currently formally documented patients’ wishes assumed that HH staff were engaging in ACP conversations and not just making note of existing written advance directives (AD). Finally, the study was limited to the scope of agency-level protocol and state-level outcomes rather than individual ACP conversations or agency-level outcomes; that is, the study did not aim to examine the ACP conversations themselves but rather whether the presence of agency protocols affected agency-level outcomes.

Delimitations

The survey design was delimited by the ability to recruit an adequate number of participants at a minimal cost. Only those home health agencies receiving CMS reimbursement were included.

Significance of the Study to Health Sciences and Nursing

The population of the United States is living longer with chronic illnesses, and a substantial portion of the HH population is comprised of people with chronic pulmonary and cardiovascular and diseases. The location of healthcare is moving away from the acute care environment and toward community-based settings such as home health (Stanhope & Lancaster, 2016). Home health care is the largest long-term modality for older adults in the United States and is the fastest-growing healthcare setting in the country (Wang et al., 2016). Decreasing or avoiding hospitalization, rehospitalization, and emergency department use are national HH quality indicators. The Structure-Process-Outcome (SPO) model (Donabedian, 1966) provides a framework to view the relationship between ACP protocols and hospitalization, rehospitalization, and emergency department use rates. This study informs HHAs across the country and throughout the world about the significance of ACP protocols.

Chapter Summary

The Institute of Medicine (IOM, 2015) has called for new protocols and systems to address dying and death in the United States. HHAs are the fastest-growing health care setting in the U. S.; and they have a prevalence of patients with pulmonary and cardiovascular diseases which are chronic and terminal, though death is not necessarily imminent. Advance care planning is a conversation that can help direct the plan of care and potentially prevent unwanted treatments at the acute care level; and ACP protocols support the interprofessional team in

having these conversations. Hospitalization, rehospitalization, and ED use in HH have been somewhat studied. ACP has been well studied in other populations and settings but very little in home health. HHAs in 9 states have recently been mandated to report on ACP, though no data is available to the public about this. The study examined relationships among these variables.

Chapter 2. Review of the Literature

This chapter is divided into sections which include methods used to search the professional literature and the review of the relevant literature divided into themes: ACP in the setting of home health setting; ACP in the setting of acute care; ACP in the setting of long-term care, plus the subtheme of the interprofessional team; ACP in the specialty outpatient setting; and ACP in the general community setting. A second search was conducted on hospitalization, rehospitalization, and emergency department use in home health. A third search was conducted on theory. A fourth search was conducted on survey responsiveness. An additional section covers Home Health Value-Based Purchasing.

Method of Literature Search and Databases Used

An integrative review method was used to identify, analyze, and synthesize findings from independent studies in order to define the current knowledge on the topic (Burns, Grove, & Gray, 2011). A comprehensive, systematic literature search was conducted using the online databases CINAHL, Medline, and PubMed with publication dates between 2015-2020. With the search term "advance care planning," 7,313 articles appeared in the three databases (2,775 in CINAHL; 4,021 in PubMed; and 517 in Medline), some of which were duplicates.

Inclusion and exclusion criteria were determined as follow here. Since most patients in home health are dealing with pulmonary and cardiovascular diagnoses, studies featuring these diagnoses were included, regardless of setting. Studies featuring HIV/AIDS, advanced cancer, end-stage renal disease, dementia, and other diagnoses were excluded because they provide their own distinct contexts for ACP. Since the interprofessional team is key to HH, included were articles focusing on the team's dynamic with patients and families. Included were articles published by international peer reviewed journals; those related to ACP and conducted in acute

care, community, long term care, home health, and specialty outpatient settings; or if they focused on the interprofessional team. Articles published in languages other than English were excluded. Study protocols, opinion pieces, literature reviews, and recommendations were excluded. Articles that focused solely on written advance directives (AD) were excluded since ACP, by the definition applied in this study, is a more comprehensive process. Of the 7,314 articles found, 23 met the inclusion criteria. One 2012 mixed methods article was then added, making a total of 24 articles, due to its historical significance: It featured cues to clinicians by cardiac patients about their desires to talk about advance care planning (Ahluwalia et al., 2012). The following is a review of the literature from each setting.

Review of Literature on Advance Care Planning

Since there is a plethora of literature regarding advance care planning, with very little of it conducted in home health, the first section of the literature review is divided with subheadings based on the environments of care, or settings, in which the studies were conducted. These include home health, acute care with some studies featuring the interprofessional team, long term care, outpatient specialty clinic, and general community settings.

ACP in the Setting of Home Health

Three studies were found in the home health setting. An Australian study outlined the current practices of ACP among home care case managers and service managers (N = 298). Thirty percent of agencies had established written ACP procedures and policies, and 48% (n = 143) of case managers reported having received ACP training. Though 70% (n = 208) of case managers had been involved in an ACP discussion in the past year and stated they viewed ACP as part of their professional role, 80% (n = 238) of the conversations lacked documentation of the client's wishes, and 85% (n = 253) of case managers noted dissatisfaction with their agencies'

ACP processes. The study demonstrated the lack of a systematized approach to ACP in Australian home health agencies (Sellers et al., 2015). In a Canadian study of homebound frail adults receiving home-based primary care, which is similar to the U. S. model of home health, Huggins et al. (2019) found that the variables significantly associated with preference not to be hospitalized included older age, less time in the home-based program, English as primary language, and a diagnosis of congestive heart failure. No similar studies conducted in the United States were found. One U. S. study found ACP facilitated by trained community health workers, among HH patients with dementia who were already frequent users of acute care, was associated with a reduction in using acute care services (Litzelman et al., 2017). However, patients with dementia do not comprise the majority of the U. S. HH population. These were the only three HH studies on ACP that were found in the search.

ACP in the Setting of Acute Care

Studies on ACP conducted in non-home health settings may be applicable to HH. The literature showed that patients with noncancer diagnoses desired to have ACP conversations (Bigger & Haddad, 2019). Smith et al. (2017), in a study of patients with chronic cardiovascular diseases who were hospitalized, found that although a majority stated a preference against cardiopulmonary resuscitation (CPR), they had not discussed their wishes with their healthcare providers. Patients with New York Heart Association (NYHA) Class II or III heart failure, who had not discussed ACP with their providers, wanted to have that discussion (Gordon et al., 2017). Patients with adult congenital heart disease (ACHD) stated their preference for having earlier communication with their providers regarding goals of care (Deng et al., 2017). The literature was clear that patients with chronic cardiovascular illnesses wanted to engage in ACP (Bigger & Haddad, 2019). The literature also showed that these patients continued to seek urgent

and acute care. ACP does not require that patients refuse future curative, aggressive treatment, but it does provide an opportunity for participants to reflect on their own definitions of quality of life and preferences for future medical treatments. Therefore, ACP gives participants the choice, in advance of crises, to abstain from certain treatments.

The literature showed that patients with noncancer diagnoses tended to pursue higher levels of care. One study found that significantly more patients with noncancer diagnoses were admitted to intensive care and requested life-sustaining treatment more often than patients with cancer (Park et al., 2015). Cardiology clinicians in the setting of acute care perceived barriers to ACP to be family- and patient-related (You et al., 2017). This begs the question of how the physician can address such barriers (Bigger & Haddad, 2019). Interprofessional team members who had agreed that a physician should lead ACP conversations also stated that the whole interprofessional team had an integral role in them (Nedjat-Haiem et al., 2017). The literature posits the whole interprofessional team as important to addressing barriers to ACP in the acute care setting; but no studies were found addressing the team's role in the HH setting (Bigger & Haddad, 2019).

ACP and the Interprofessional Team

While not all studies in the acute care setting featured the interprofessional team, some of them did. Since the interprofessional team is key to home health care, this subsection has been added to the review of literature on ACP. The studies reviewed in this section focused on the interprofessional team dynamic with patients and families. A novel ACP tool used by the interprofessional team in the ICU setting was associated with (a) improved congruence between families and healthcare providers about decisions over the intensity of care; (b) the provision of end-of-life (EOL) information; and (b) the allowance of family support space (Wessman et al.,

2015). The study showed ACP was linked with improvements in the team's work stress. It is currently unknown if these outcomes would be replicable in home health.

Members of the interprofessional team have various important roles in goals-of-care discussions (You et al., 2017). The literature did not support that the physician must always lead ACP conversations (Bigger & Haddad, 2019). The involvement of non-physician staff was linked with greater likelihood of completion of written advance directives (AD), which is one part of the ACP process (Clark et al. (2017). One study supported that effective ACP required (a) avoidance of an entirely physician-led approach; (b) attention to physician concerns; (c) team-based frameworks; (d) intensive local leadership; and (e) additional resources (Dixon & Knapp, 2018). Some evidence was published on how to support the interprofessional team but reflected that most agencies lacked a standardized approach (Bigger & Haddad, 2019). In the absence of a standardized, collaborative approach to ACP, Australian health care providers tended to self-determine roles in ACP in a rural health setting (Fletcher et al., 2016). There is a gap in knowledge on how to support a standardized approach to ACP. Nurse facilitation of ACP has been linked with an increased number of ACP discussions and completion of formal documents (Sinclair et al., 2017). However, little research exists on ACP and the other disciplines on the interprofessional team in HH.

A Canadian grounded theory study of end-of-life planning discussions was conducted with interprofessional team members including occupational therapists, physical therapists, speech therapists, registered nurses, social workers, dieticians, and physicians who were recruited across acute, long-term, and community-based settings (Ho et al., 2016). Results revealed 3 barriers and one facilitator to the discussions. The barriers included (a) discomfort with death and dying, (b) confusion about role responsibility, and (c) lack of coordinated care.

The one facilitator that was found to support the discussions was collaborative interprofessional teamwork. Specifically, "having dialogues early on amongst members of the interprofessional care team to coordinate consistent messages within and across the teams …was considered vital" (Ho et al., 2016, p. 800). Interdisciplinary cohesion on goals of care planning was essential to facilitating goals of care conversations. Although none of the above articles took place in the HH setting, they may be useful to HH clinicians because they work as an interprofessional team.

ACP in the Setting of Long-Term Care

Studies on ACP conducted in the long-term care (LTC) setting were found to illuminate the role of family. Patients and relatives were perceived as intertwined units that shared experiences of dying and death, and relatives' participation in the ACP process was significant to understanding patient values (Thoresen and Lillemoen, 2016). No similar study was found in HH. However, home health clinicians may be informed by such studies since both the HH and the LTC setting can involve family and surrogates.

The role of nurse practitioners (NPs) in LTC was discussed in the literature on ACP. One study showed that when NPs paired ACP with a mortality risk assessment (MRA) to identify patients with a 2-year prognosis, it was linked with (a) an increase in patients with a goal of comfort care; (b) fewer patients having a status of full code; and (c) a reduction in hospitalizations (Mullaney et al., 2018). NPs, like physicians, have the authority to prognosticate, but other members of the interprofessional team do not. However, since ACP happens in advance of a medical crisis, these conversations do not require a limited prognosis. Regardless of the prognosis, the whole interprofessional team can still listen for patient requests for prognosis and take them as cues to discuss ACP (Ahluwalia et al., 2012). Not one study was found discussing how the non-physician/non-NP interprofessional HH team manages patient questions regarding

prognosis. Mullaney et al.'s (2018) study is meaningful to the present study because ACP was linked with a reduction in hospitalizations, an outcome goal shared by HH.

ACP in the Setting of Outpatient Specialty Clinics

While receiving HH services, patients may still access clinics as outpatients. In this setting, factors that facilitate effective tailoring of ACP interventions and achieve greater ACP uptake include (a) awareness of symptom burden, (b) readiness to engage in ACP, and (c) relevant psychosocial factors (Sinclair et al., 2017). In one historically significant study in an outpatient cardiac clinic, patients themselves were observed to try to initiate ACP conversations via various cues (Ahluwalia et al., 2012). This historically significant study may be applicable to HH since it informs clinicians, regardless of discipline, about how to listen for patient cues and how to avoid missing opportunities for ACP. Patient-initiated statements included (a) expressions of emotion regarding the possibility of future decline or death, such as, "getting ready to die soon…everybody got to die;" (b) requests for information regarding prognosis or trajectory, such as, "I'm just wondering how fatal do you think? – I mean, any time?" and (c) articulation of preferences regarding heart failure-related treatments, such as, "I didn't want to take Coumadin. Y'all fought me to get the Coumadin. But I don't want it" (Ahluwalia et al., 2012). When clinicians picked up on patient cues, visits took less time than those with missed opportunities since patients did not repeat themselves attempting to cue clinicians. This is significant to HH because any member of the interprofessional team may be present when a patient attempts to initiate ACP, and all members of the team must balance concerns about time with patient-centered care (Bigger & Haddad, 2019).

ACP in the Setting of the General Community

Studies conducted in the general community setting, outside the healthcare environment, demonstrated the influence of economic class and family on ACP. Among older adults with chronic illness with complexity, the likelihood of having engaged in ACP to assign a healthcare power of attorney was associated with higher self-perceived burden on caregivers (Hash et al., 2016). Generational relatedness concerning openness about death anxiety and death has been linked with willingness to engage in sensitive subject conversations; and family has been found to be more influential than age regarding sharing of knowledge about ACP (Freytag & Rauscher, 2017). HH clinicians may find this relevant since (a) patients are often living with family, and/or (b) family are often involved in patients' care. Surrogates can have distinct perceptions, so they can either impede or facilitate ACP (Fried et al., 2018). Although the above studies were not conducted in HH, the literature informs HH clinicians on the influence of family dynamics in ACP. Next, higher levels of income and education have been associated with higher ACP knowledge levels (Tripken & Elrod, 2018; Tripken et al., 2018). These findings can inform HH clinicians about families' probable baseline of ACP knowledge levels so that the clinicians can thus tailor conversations accordingly. No studies were found in HH regarding the influence of family, economic class, or other factors that may affect the desire for life-prolonging treatment.

Review of Literature on Hospitalization and ED Use in Home Health

A similar search was conducted with the search terms "emergency department use and acute care hospitalization and home health" for articles in English published within the last 5 years. CINAHL contained 3; PubMed contained 357; and Medline contained 5, some of which were duplicates. Included in this review were 4 home-health-specific articles or those focusing on persons with pulmonary or heart diseases. Excluded from this review were those that were not

home-health-specific. They are separated into the sections of demographic and diagnostic factors, mental and physical health, and clinician visit factors.

Health Disparities, Demographics, and Diagnostic Factors

Medicare databases include racial/ethnic demographics of American Indian, Asian/Pacific Islander, Black, Hispanic, White, and Other. However, an examination of the 2016 HHA Provider Aggregate Report (cms.gov) revealed that many of these data were missing. Research regarding health disparities in home health is sparse and findings have been mixed, with inconsistent associations between demographics and health care utilization (Chase et al., 2020). A regional 2020 study of HH patients found the highest utilization rate (45%) of hospitalization and highest utilization rate (34%) of the ED among Black patients. Hispanic patients in the same study also had greater odds of ED visits as compared to non-Hispanic Whites. The study showed that Asian HH patients had no significant difference in odds of ED visit or rehospitalization as compared to non-Hispanic Whites (Chase et al., 2020) despite indicators of higher morbidity.

A key study by Oskawe et al. (2020) found that lower rates of hospitalization were associated with HHAs having for-profit status, having high rates of dually-eligible patients (Medicare and Medicaid), serving more than 50% Black population, and being located in midwestern, southern, and western regions of the U. S. Higher rates of hospitalization were associated with agencies having high proportions of patients with diagnoses of COPD, schizophrenia, heart failure, stroke, and Alzheimer's Disease. Higher rates of ED use were associated with agencies with higher proportions of patients with COPD. Osakwe et al. (2020) called for further research into processes that may be associated with hospitalization and ED use, a call to which this study responds. Since there is conflicting evidence about Black or African

American patient proportions and hospitalization, this study will focus on that particular demographic in one hypothesis.

Mental and Physical Health Factors

Mental and physical health factors have been studied in relationship to hospitalization and ED use among HH patients. A Finnish study found that the strongest independent risk factors for unplanned hospitalizations among home care clients were hospitalization in the last year, age of 90 and older, renal insufficiency, and using ten or more medications (Rönneikkö et al., 2017). Next, Wang et al. (2016) found that higher rates of hospitalization and ED use among U. S. HH patients were associated with "depression intervention use," an item in the OASIS data set that was associated with the following patient characteristics: Higher rates of depression diagnosis, white, younger, poor physical health, living in assisted living facilities, and receiving less social support than those not receiving depression interventions from HH staff. In Finland, HH hospitalization was found to be prevalent among older adults, while in the U. S. it has been associated with young people with depression who live in assisted living facilities.

Regardless of patient characteristics, it appears that respiratory and cardiovascular problems have been common reasons listed for acute and urgent healthcare use among U.S. HH patients. In a 2016 study by Wang et al., OASIS data from 2010 revealed the following (Table 2). For acute care hospitalization, the top three reasons were respiratory problems (non-infection) (8.9%); respiratory infection (7.4%); and heart failure (6.7). For 30-day rehospitalization, the top four reasons were respiratory problems(non-infection) (7.5%); respiratory infection (6.9%); dehydration, malnutrition (6.1%), and heart failure (5.6%). For ED use, the top four reasons were respiratory problems (non-infection); injury caused by fall (8.3%); respiratory infection (7.2%) and heart failure (6.9%). In addition to revealing the top contributors to hospitalization and ED

use among HH patients, Wang et al. (2016) implicate the need for HH clinicians to have increased training on addressing the psychosocial domain. 40% of each event was attributed to other or unknown causes. No similar studies were found using recent OASIS data.

Table 2

Reasons for Hospitalization and ED Admissions in HH

Event	Reason for visit	Percentage of Visits
Acute Care Hospitalization	Respiratory Problems (non-infection)	8.9%
	Respiratory Infection	7.4%
	Heart Failure	5.6%
30-day Rehospitalization	Respiratory Problems (non-infection)	7.5%
	Respiratory Infection	6.9%
	Dehydration, malnutrition	6.1%
	Heart Failure	5.6%
Emergency Department Use	Respiratory Problems (non-infection)	7.2%
	Injury caused by fall	8.3%
	Respiratory Infection	7.2%
	Heart Failure	6.9%

(Wang et al., 2020)

Next, Curcio et al. (2019) found among cardiac surgery patients that those with depression diagnosis used more expensive healthcare services as compared to non-depressed patients in the first year after surgery. The services used by depressed patients included overnight hospitalizations, emergency visits, and home health care services. Cardiac surgery patients with anxiety were found to have more outpatient visits as compared to patients without anxiety. Depression seemed to have the strongest association with expensive healthcare services when compared with other mental health diagnoses. The above four articles reveal both mental and physical factors linked with hospitalization and ED use among HH patients.

Clinician Visit Factors

In a Canadian study, Jones et al. (2018) found that the number one diagnosis associated with ED visits among HH patients was cardiovascular disease. Further, the investigators found that HH nursing visits, as compared to visits by other disciplines, were linked with an increased likelihood of patient visits to the ED after 5:00 p. m. on the same day. While the study did not examine the reasons for this, the authors suggested in their discussion that HH nursing has been reduced to a task focus that precludes comprehensive care; that HH nurses may be referring patients to other settings; and that team members from other disciplines might not assess for acute medical problems as nurses do. The authors called for further research on the potential contributors to this finding including HH nurses' lack of direct management of clinical problems and the nurses' limited time. This was the only study found in the last five years regarding HH visit factors linked with emergency department use.

The review of literature on hospitalization and ED use in HH revealed associations with demographic and diagnostic factors, physical and mental health factors, and clinician visit factors. What is missing from the literature is investigation into the relationship between HHA ACP protocols and hospitalization, rehospitalization, and ED use rates.

Home Health Value Based Purchasing

In September 2020, the Arbor Research Collaborative for Health prepared for CMS an evaluation of HHVBP in a third annual report. Using both qualitative and quantitative methods, the research collaborative found that HHVBP had a modest impact on lowering hospitalization rates (declines of 0.21-0.30 percentage points, or 1.3%-1.8% decrease) and increasing higher emergency department use rates (0.28 percentage points, or 2.4% increase) than in years prior for those same participating agencies. The report includes some anecdotal comments from agencies

about operational changes that may have influenced outcomes, but overall, the conclusion was that "further analysis will be needed to ascertain what specific actions by agencies, encouraged by HHVBP, explains the overall impacts on hospitalization rates…observed through the first three years of the model" (Arbor Research Collaborative, 2020, p. 5). One activity among the most often mentioned was "improving care coordination," including "when home health is no longer the best option for a patient, agencies helped them to transition to places such as hospice, SNFs, and assisted living. Staff would have conversations with patients on their patient-centered goals to determine if they may want to transition to hospice" (Arbor Research Collaborative, 2020, p. 111). Beyond these statements, there is not much mention of the process or impacts of advance care planning in HHVBP states. Ultimately, the report states there is no early confirmation in specific agency practices to account for reductions in hospitalizations among HHVBP agencies, and it calls for future research to identify mediating factors impacting hospitalization and emergency department use. The present study attempts to answer this call.

Review of Literature on Theory

To review the literature on theory, a search was conducted using CINAHL, PubMed, and Medline with the date range of the last five years, English language, and the search terms "advance care planning" and "theory," revealing a total of 152 results (71 in CINAHL, 6 in Medline, and 75 in PubMed), some of which were duplicates. Patient-level theories addressing the interpersonal dynamics involved in ACP appeared, such as the Stages of Change theory used in Motivational Interviewing (Anderson et al., 2018; McConnauohy et al., 1983); Problematic Integration Theory (Rafferty et al., 2016); and the Theory of Planned Behavior (Azjen, 2011). Research-based theories such as Grounded Theory (Strauss & Corbin, 1994; Taneja, 2019) also appeared. The organizational-level Theory of Change (Gilissen et al., 2018) appeared, focusing

on practice-level changes. These were excluded from the present study due to their patient-level level focus as compared to the agency-level focus of the present study.

A 2010 article was then included due to its historical significance: Investigators used Donabedian's SPO model to study nurse managers' perspectives of process and structure characteristics related to nursing home residents' advance directives (Krok et al.). This study then formed the basis of a study by Sellers et al. (2015) on advance care planning practices in Australian home health. Since Sellars et al.'s (2015) survey instrument was based on Krok et al.'s (2010) survey instrument, both articles were deemed useful to the present study in terms of theory and survey instrument.

Donabedian's Structure-Process-Outcome model appeared in a comprehensive literature review conducted by Biondo et al. (2016), examining how multi-level healthcare systems evaluated ACP initiatives. The settings of the 46 unique studies included acute care, outpatient care, primary care, long term care, and community services. Structures such as healthcare system infrastructure were listed, such as the presence of an end-of-life (EOL) register and coordinator. Processes were listed such as (a) evidence that ACP discussions have occurred; (b) the patient has named an agent or substitute decision-maker; (c) the use of system processes to support ACP; and (d) the patient's end-of-life treatment preferences are documented (Biondo et al., 2016). Outcomes such as healthcare resource utilization were listed. Structures, processes, and outcomes relevant to the study appear in Table 3.

Table 3

Use of the Donabedian Model to Study ACP

Structure	Processes	Outcomes
Palliative Care infrastructure (e.g., presence of an EOL register and coordinator)	A medical order is present in the patient's chart	Concordance measures/compliance with patient's EOL treatment preferences
	Evidence that ACP/AD/EOL discussions have occurred	Patient-reported outcomes/Patient experience
	Patient has named an agent or substitute decision-maker	Healthcare provider-reported outcomes/experience
	Use of system processes to support ACP	Family-/caregiver-reported outcomes/family experience
	Palliative care processes (e.g., use of an EOL care pathway)	Healthcare resource utilization
	Document accessibility	Economic outcomes

(Biondo et al., 2016)

Biondo et al. (2016) demonstrated the effective use of the Donabedian model to study the structures, processes, and outcomes related to ACP in multiple healthcare settings. This model was chosen for the present study because it involves system-level initiatives and system-level outcomes.

Gap in Literature

Of the current literature regarding ACP, very little focuses on HH. ACP has been linked with decreased hospitalization and ED use rates in HH patients with dementia, but no evidence was found regarding ACP with HH patients with chronic pulmonary and/or cardiovascular diseases. Apart from the general community setting, most studies on ACP have focused on patients with serious illnesses such as end stage renal disease or cancer. Since ACP is for all adults, and since there is a substantial percentage of HH patients living with pulmonary and/or cardiovascular diseases who may seek acute care interventions; research is needed to support the establishment of ACP protocols in order to support the HH team's consistent provision of ACP.

Research conducted in other settings may be useful to HH agencies seeking evidence, but a gap in knowledge exists regarding ACP protocols in HH (Bigger & Haddad, 2019). Some literature has been published on the demographic and diagnostic factors associated with hospitalization and ED use among HH patients, but there is a gap in the literature regarding the relationship between ACP and these outcome measures. HH agencies need evidence developed in their unique environment of care. This study is intended to help fill that gap. In order to best serve HH staff, surrogate decision-makers, patients, and families, such research is needed.

Hypothesized Study Model

Based on the review of literature and the identified gaps, the current study was designed to examine the relationship among the identified variables. The hypothesized study model compares the relationship of ACP protocols with the variables of hospitalization, rehospitalization, and emergency department use rates. It was hypothesized that higher scores on ACP protocols would be associated with lower hospitalization, rehospitalization and emergency department use rates scores.

Review of Literature on Survey Responsiveness

The existing literature contained evidence about factors impacting survey response rate. For example, in educational research, online survey response rate has been influenced by survey structure, interests of participants, communication methods, and assurance of confidentiality and privacy (Salen & Bista, 2017). The concept of survey fatigue has been mentioned in some articles, though no evidence could be found supporting this concept. To support adequate response rates, educational researchers have been encouraged to (a) enlist the aid of organizations known to the target population, (b) use a personalized, professional invitation letter prior to sending the survey, including the approximate time it will take to complete it, and (c)

send at least one, but not more than three, reminders to complete the survey (Mol, 2017; Salen & Bista, 2017). In health care research, to boost response rate, evidence has supported (a) using samples assembled from professional organizations' membership lists, (b) using mixed-mode recruitment in the form of mailed letters to bolster email-based communication, and (c) using two to three reminders at one-week intervals (Silverman et al., 2018). In surveys administered to U. S. primary care physicians, effective methods for maximizing response rates have included hand-written envelopes, self-selection of survey mode, and multiple reminders, (Brtnikova et al., 2018). Finally, in the general population, among pro-social individuals, altruistic appeals have been found to be equally or more effective than monetary incentives, which means that the target population matters when designing incentive strategies (Conn et al., 2019).

Chapter Summary

In addition to reviewing the literature on theory, survey responsiveness, and the HHVBP program, an integrated review revealed studies on ACP in a variety of settings, with very few in HH. HH staff may find some of these helpful, especially those addressing the interprofessional team's role. However, there is a dearth of literature regarding ACP in HH with patients with pulmonary and cardiovascular diseases. Some literature exists on demographic and diagnostic factors associated with hospitalization and ED use, but none have been found examining the relationship of ACP protocols with HH outcome measures. The current study aims to help fill that gap in the literature.

Chapter 3. Methods

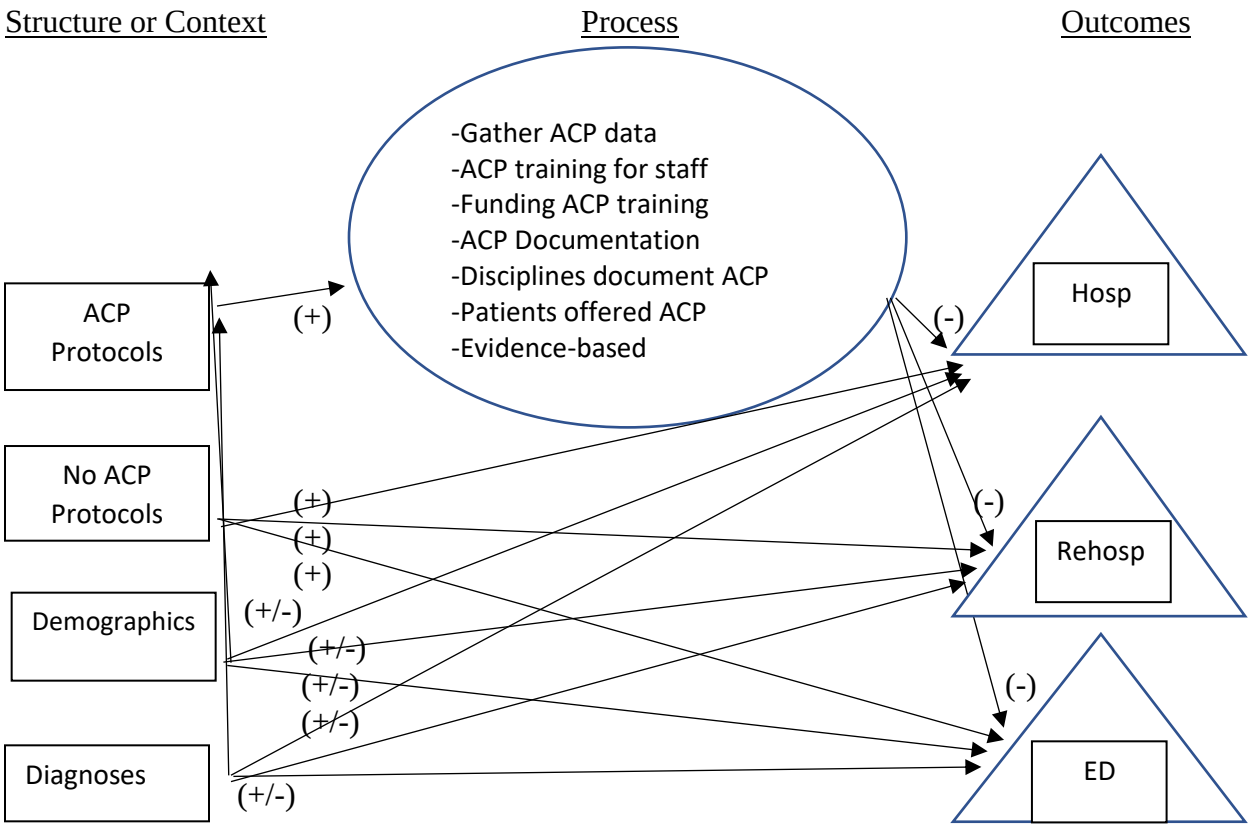
This chapter includes a discussion of the specific methods and procedures used. A statistical explanation of the model is provided. The design, the setting, the population, and the sample of the study are included. Instrumentation is described, along with validity and reliability. Independent and dependent variables are defined. Descriptions of the operational definitions are provided. The procedure, including recruitment and distribution, data collection, and protection of human subjects are explained. Data analysis, including data cleaning, with descriptive statistics and hypothesis testing are described.

Model

The statistical model appears in Figure 3.

Figure 3

Statistical Model: Structure/Context-Process-Outcome of ACP and HH Outcomes



The investigator-developed hypothesized model as shown illustrates that structures affect processes which then affect outcomes. The model was derived from Donabedian's (1966) Structure-Process-Outcome (SPO) theory. This framework is designed to demonstrate the effects of structure (HHA protocols and characteristics) on process (attributes of ACP protocols) and the outcomes of hospitalization, rehospitalization, and ED use. The researcher examined the model using data from CMS about demographics, diagnoses, hospitalization, rehospitalization, and ED use and from an electronic survey about ACP protocols. The researcher hypothesized that HHAs with higher scores on ACP protocols would also have lower rates of hospitalization, rehospitalization, and emergency department use rates scores. The researcher also examined how these factors may vary between different demographic and diagnostic cohorts.

Design

A cross-sectional quasi-interventional design was used to examine the relationship between ACP protocols and hospitalization, rehospitalization, and emergency department use rates. Existing CMS databases were used for demographic and diagnostic information as well as hospitalization, rehospitalization, and ED use rates (cms.gov). Additional data was collected on ACP protocols and merged with the existing database to create a dataset that has all of the needed information to address the hypotheses in this study.

Setting

The study was conducted on home health agencies in a representative sample drawn from 18 regionally representative states in the United States.

Population

The findings in this study may not apply to other countries. However, they are expected to apply to HHAs in other states within the United States.

Sample

The sample was comprised of the HHAs in 9 HHVBP states selected randomly by the US Department of Health and Human Services for their regionality and 9 non-HHVBP states selected by the researcher. Although HHAs in only 9 states were mandated to report to CMS about ACP, nothing precluded HHAs in the non-HHVBP states from having ACP protocols. Therefore, the sample included HHAs in the 9 HHVBP states as well as 9 non-HHVBP states, each with comparable health and economic characteristics to each HHVBP state. Parity between each HHVBP and non- HHVBP state was obtained by the researcher who matched each state with another state based on economy and health data according to the U. S. Census (U.S. Census Bureau, 2019) (Appendix E). The researcher called by telephone a sample of 26% of HHAs (n = 768) in the 18 states. Of those, an average of 46% provided contact names with email addresses (n = 275), to which the researcher then sent a hand-signed introductory letter on paper, followed by an email containing the survey link.

Instrumentation

Two instruments were used in the study: OASIS and the ACPP. Hospitalization, rehospitalization, and ED use were events reported by HH clinicians via the Outcome and Assessment Information Set (OASIS). OASIS items have been shown to have high interrater reliability ($k \geq 0.6$) (Madigan & Fortinsky, 2001, 2004). These data were collected at multiple different time points, including admission or readmission, periodic certification (every 60 days), discharge to home, transfer to LTC settings, and death, and were recorded by licensed therapists

and nurses trained in documenting in OASIS. Data were collected using a variety of strategies, including direct observation, review of medical documents, team discussion, and patient/caregiver interview (DMS Survey and Certification Group, n. d.). These data were submitted by HHAs to the Centers for Medicare and Medicaid (CMS), who then made them publicly available through the Home Health Compare website (medicare.gov/HHCompare/Home.asp).

Validity and Reliability

No psychometrically tested instrument was found regarding ACP in HH or ACP protocols in HH. Therefore, the researcher developed the ACPP survey instrument. It was based on one developed by Krok et al. (2010) on advance directives' effects on outcomes in nursing homes in the U. S., which was then adapted by Silvester et al. (2013) to study the quality of advance care planning protocols and practice in Australian residential aged care facilities. Sellars et al. (2015) then adapted the survey instrument to study ACP in Australian home health. The Sellars et al. (2015) instrument was then adapted for the present study on ACP in U. S. home health (Appendix E). Krok et al. (2010) did not know the validity and reliability of the instrument because this testing was not done.

Given that instrument of Krok et al. (2010) was not psychometrically tested, the researcher used the available variables and data to do a cursory test for reliability. The test is shown in the results chapter (H4) for comparing HHVBP and ACP protocols. The rationale for selecting these two variables is that CMS requires HHAs in HHVBP states to report on ACP and should have ACP protocols. The chi-squared was 10.86 ($p = 0.0005$), which shows a high measurement reliability.

The measurement validity can be estimated from the item concerning whether the respondent knew if they were in an HHVBP state. Although assessing the validity for only one item cannot be assumed to reflect the other items, it does give at least an indication of the accuracy of participant responses. The type of validity in this case is criterion validity (Cripps, 2017) because the accuracy of the response could be compared to a variable that was known to be correct per CMS regulations. The alpha value was 91%. This was considered to be a very high measurement validity.

Independent Variables

Advance Care Planning Protocol (ACPP): ACPP was measured by scoring survey questions (Table 4). Specifically, the structural level of ACPP was measured by the self-reports of the presence of written policies, procedures, or protocols on ACP. The process level of ACPP was measured by survey items including self-reports of the following: the agency gathering data on ACP; the percentage of staff having undertaken training on ACP; whether ACP training was funded by the agency; the provision of a format for the team to formally document patients' wishes for future care in the health record; the number of disciplines that had access to a format to document ACP discussions; the proportion of patients to which ACP was provided; and whether the ACP protocol was based on an existing framework.

No scored instruments were available to assess ACPP intensity, so an instrument was developed by the researcher from an existing survey by assigning point values to key items in the survey. Scores were computed for several of the key variables according to Table 4.

Table 4

Scoring of Key ACPP Variables

Survey Item #		4 points	3 points	2 points	1 point	0 points
6	Gather ACP data?	Yes				No or don't know
7	Written ACP protocols?	Yes				No or don't know
8	% of staff trained?	76-100%	51-75%	26-50%	Less than 25%	0% or don't know
9	ACP training funded by agency?	Yes				No or don't know
10	Clinician documentation of ACP?	Yes				No or don't know
11	Which disciplines can document ACP? (select all that apply)				RN, NA, PT, PT, ST, SW, Dietician, other	None or don't know
12	Proportion of patients offered ACP?	All	Some, with no particular rationale	Some, with specific criteria		None or don't know
13	Existing framework?	Yes, modeled after an evidence-based approach	Yes, modeled after information found in the literature	Yes, modeled after expert guidance		No or don't know

The TPCP score stood for "total percentage of cardiac and pulmonary diagnoses." It included agency reports of diagnoses of Atrial Fibrillation, Congestive Heart Failure, Chronic Obstructive Pulmonary Disease, and Asthma. These were summed to determine the TPCP per agency.

Dependent Variables

Hospitalization**:** "Acute Care Hospitalization (ACH)" was listed for any HH patient reported as being hospitalized during the first 60 days of a HH stay.

Rehospitalization was defined as any unplanned, potentially preventable readmission to an acute care hospital for a Medicare beneficiary patient within the first 31 days following discharge from the hospital. To be considered a rehospitalization, the hospital admitting diagnosis must be considered to be unplanned and potentially preventable. The HH admission must have occurred within up to 30 days of discharge from a prior proximal hospital stay (ABT Associates, 2016).

Emergency Department (ED) Use was measured by an item in the CMS database called "Emergency Department (ED) Use without Hospitalization" for any HH patient reported as having presented at an emergency department during the first 60 days of a HH stay without being admitted to a hospital.

The WACSUR score was a weighted composite score of hospitalization, rehospitalization, and ED use. The WACSUR score was developed based on the researcher's clinical experience. Hospitalization was calculated as twice as severe as rehospitalization, and rehospitalization was calculated as twice as severe as ED use. The weights were assigned as follow: 1 for ED use, 2 for rehospitalization, and 4 for hospitalization. They were summed into the WACSUR score for each agency, based on available data.

Some HHAs did not have data listed for hospitalization, rehospitalization, or ED use, due to the number of episodes being too small to report. Therefore, one test for each was run with all available data, and a second test was run with imputed data, where the missing data were ascribed the number zero. The rationale for this was that since the number of episodes was too

small to report, zero was a comparable number for the purposes of the second test.

Procedure

Recruitment and Distribution

Following dissertation proposal approval and IRB approval the participants were recruited, and the CMS database was accessed. For the purposes of this study, no monetary, gift, or prize incentives were offered. The researcher did offer respondents the benefit of receiving the abstract before publication.

The sample was recruited via a CMS database (https://data.medicare.gov/Home-Health-Compare/Home-Health-Care-Agencies/6jpm-sxkc) which was publicly available. An endorsement letter was requested by the researcher via email and U. S. mail from the National Association of Home Care and Hospice (NAHC). The researcher offered to send the NAHC privileged communication in the form of a copy of the abstract prior to publication, with the caveat that the NAHC would not post or otherwise publicize the information prior to its publication by the author. A response was never received from the NAHC.

The researcher used a random number generator to comprise the sample. Of the 2,902 HHAs in the 18 sample states, the author called via telephone a total of 26% (n = 768) (18% in the first round; 8% in the second round) to request the names, email addresses, and mailing addresses of agency representatives to whom the survey would be sent (Appendices B, C & D). An average of 46% (n = 275) provided contact names and email addresses. Then, to each one that provided a name and contact information, the researcher sent via U. S. mail a professional, hand-signed, mailed invitation letter on paper explaining the research, confidentiality, and the approximate time to complete the survey. Confidentiality was assured in the letter and at the beginning of the survey itself. One week after the initial paper letter was mailed, the researcher

sent an email with the survey link and informed consent statement. Weekly reminder emails were sent for two weeks after the initial survey link was emailed. For those whose email addresses did not accept external messages, paper versions of the study were mailed via U. S. mail. No responses were accepted after November 30, 2020.

Collection

OASIS data on demographics, diagnoses, hospitalization, rehospitalization, and ED use were collected by CMS and accessed by the researcher. Data from the ACPP survey was collected online by the researcher via electronic survey software (surveymonkey.com) and on paper via U. S. mail. The data was imported into a statistical processor using R language version 3.6.2 for statistical analysis.

Protection of Human Subjects

Permission to conduct this study was granted by the Institutional Review Board (IRB) at East Tennessee State University. Data collected from the survey and through the CMS database were agency-level and thus not identifiable by individual patient names.

Data Cleaning

The first step was to validate and clean the data. The CMS data on acute care services use were collected in the first half of 2020, and the survey data was collected in the second half of 2020. The most recent demographic and diagnostic data available were from 2016. It is important to bear in mind that different data were valid at different times. This must be kept in mind when considering the conclusions.

For the ownership status variable, the most recent data were used. If data were missing, the CMS data were used. In the case of respondents reporting they were not-for-profit when the

CMS database as well as the agency name indicated they were government-owned, the CMS data were used.

For the state variable, some respondents replied “United States” or multiple states. These were clarified by cross-referencing the sample list and date of reply in the survey software to discern one state per each respondent.

Data Analysis

The key variables in the study were ACPP scores, TPCP scores, WACSUR scores, and demographic and diagnostic characteristics. Descriptive statistics and regression analyses were conducted.

The distribution of all variables was then calculated. Descriptive statistics including means, medians, standard deviations, and ranges were then computed, and the normality of the distributions for the key scores listed above was assessed. Since most of the variables were not normally distributed, nonparametric statistics were used for all. The statistical significance was calculated using Spearman’s correlation coefficient. All hypotheses were directional that used a one-tailed hypothesis test and an alpha level of $p = 0.05$.

For hospitalization, rehospitalization rate, and ED use rate, the z-score = (score-mean)/SD was computed as a measure of the size of the difference between the group of 9 HHVBP states and group of 9 non-HHVBP states.

The Kruskal-Wallis rank sum test was used to determine statistical significance between the sequences of each of the following: ACPP scores and region, WACSUR scores and region, hospitalization and region, rehospitalization and region, ED use and region, and TPCP scores by region.

Chapter Summary

A Donabedian SPO-based model served as the framework for this study. A cross-sectional quasi experimental design was used to examine the relationship between ACP protocols and agency outcomes in a sample of HHAs in 18 states. Specifically, a sample of agencies from 9 states participating in CMS's HHVBP program plus a sample of agencies from 9 non-HHVBP states were studied. Parametric and descriptive statistics and a regression analysis design were used to examine the relationships between ACPP and hospitalization, rehospitalization, ED use rates, and demographic and diagnostic characteristics.

Chapter 4. Results

The following section will explain the results that are listed in multiple tables and figures. First descriptive statistics will include agency and respondent data, regional data, and acute care services use data. The ACPP, WACSUR, and TPCP scores are described including N, mean, median, standard deviation, and skew. Hypothesis testing results are reported in order from H1 to H10. Tables and figures are explained and summarized in the text.

Descriptive Statistics

Agency and Respondent Data

Descriptive statistics include agency data with U. S. state location of HHAs, HHA ownership status, respondent role, and HHVBP status if known (Table 5). The total N for the study was 89. Also included are descriptive statistics for hospitalization, rehospitalization, and emergency department use rates (Table 6). The greatest number of respondents came from Florida (n = 17; 19.1%), and the least number came from Maryland (n = 1; 1.1%) and Idaho (n = 1; 1.1%). No states from the surveyed sample were missing. Regarding ownership status, n = 59 (66.3%) HHAs were for-profit, n = 22 (24.7%) were not-for-profit, and n = 8 (9.0%) were government-owned. Administrators and other kinds of managers made up greater than 91.1% of the respondents. N = 58 (65.1%) self-identified as participating in HHVBP; 24 (27.0%) self-identified as not participating in HHVBP; and 7 (7.9%) replied that they did not know whether their agency was participating in HHVBP. Of those responding that they did not know whether their agencies were participating in HHVBP, Florida ranked the highest (n = 5) although it is a designated HHVBP state per CMS; followed by Texas (n = 3) which is not designated as an HHVBP state. The database was corrected to align these 8 reported unknowns into HHVBP or non-HHVBP categories per CMS regulation. In general, the typical HHA was for-profit and

identified as participating in HHVBP, and the typical respondent was in some kind of leadership role.

Table 5

Descriptive Statistics: Agency Data[1]

Category	N	Percent	CMS HHVBP State	
State				
Arizona	2	2.3	Yes	
Arkansas	8	9.0	No	
Connecticut	9	10.1	No	
Delaware	2	2.2	No	
Florida	17	19.1	Yes	
Georgia	2	2.2	No	
Idaho	1	1.1	No	
Iowa	6	6.7	Yes	
Kansas	5	5.6	No	
Maryland	1	1.1	Yes	
Massachusetts	3	3.4	Yes	
Missouri	3	3.4	No	
Nebraska	3	3.4	Yes	
New Mexico	2	2.2	No	
North Carolina	8	9.0	Yes	
Tennessee	5	5.6	Yes	
Texas	8	9.0	No	
Washington	4	4.5	Yes	
Missing	0	0		
Ownership Status				
For Profit	59	66.3		
Not-for-profit	22	24.7		
Governmental	8	9.0		
Missing	0	0		
Respondent Role				
Administrator/ Manager	81	91.0		
Direct-care clinician	0	0		
Data gatherer	1	1.1		
Other	7	7.9	Director of Operations n=1 RN Owner n=1 Director of Clinical Services n=1	

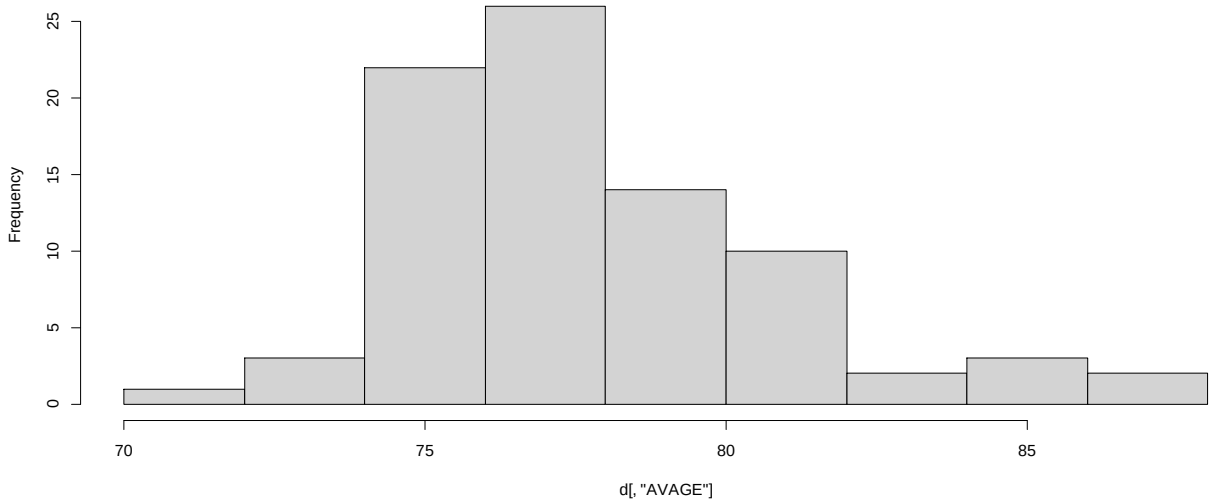
			Clinical Director n=1 Medical Records n=1 Human Resources n=1 Business Office Manager n=1	
Missing	0	0		
HHVBP Reporting State				
Yes	58	65.1		
No	24	27.0		
Don't Know	7	7.9	FL(n = 5); TX (n = 3)	
Missing	0	0		
Region				
Far West	5	5.6		
Mideast	3	3.4		
Northeast	12	13.5		
Plains	17	19.1		
Southeast	40	44.9		
Southwest	12	13.5		

[1]All counts and percentages are based on valid (non-missing) data, except "Missing" rows.

The average age of patients was 78.2. The distribution of average ages was relatively normally distributed with a slight skew to the right. Figure 4 shows a histogram of the distribution of average age of patients.

Figure 4

Average Age of patients in HHAs



Acute Care Services Use Data

The acute care services included were hospitalization, rehospitalization, and emergency department use. The mean hospitalization rate was 15.52 (minimum 1.6, maximum 23.8); the mean rehospitalization rate was 3.45 (minimum 2.64, maximum 4.99); and the mean ED use rate was 13.42 (minimum 6.8, maximum 20.7). Data on hospitalization were missing for 18 HHAs due to the number of patient episodes for this measure being too small to report or the agency existing for fewer than 6 months, per CMS. Again, according to CMS, data on rehospitalization were missing for 23 HHAs for the same reasons as above or for the reason that data were not available. Data on ED use were missing for 18 HHAs due to patient episodes being too few to report, per CMS. The most missing data was on rehospitalization. The typical HHA had a hospitalization rate of 15.52, a rehospitalization rate of 3.45, and an ED use rate of 13.42.

Table 6

Descriptive Statistics: Race, Hospitalization, Rehospitalization, and ED Use[1]

Variable	Median	Mean	SD	N	N Missing	Percent Missing	Minimum	Maximum
Proportion of Black Patients	0.08	53	0.21	53	36	68	0	0.96
Hospitalization Rates for Home Health Agencies	15.25	15.52	3.4	72	17	19.1	1.6	23.8
Rehospitalization Rates for Home Health Agencies	3.38	3.45	0.46	67	22	24.72	2.64	4.99
ED Use Rates for Home Health Agencies	13.2	13.42	3.26	72	18	20.2	6.8	20.7

[1]All counts and percentages are based on valid (non-missing) data, except “Missing” rows.

Description of ACPP Score

The ACPP (advance care planning protocol) instrument measured the robustness of each agency's ACP protocol. First, the ACPP score was calculated. The n, means, and standard deviations of each part of the score appear in Table 7. The distribution appears in Figure 5.

Table 7

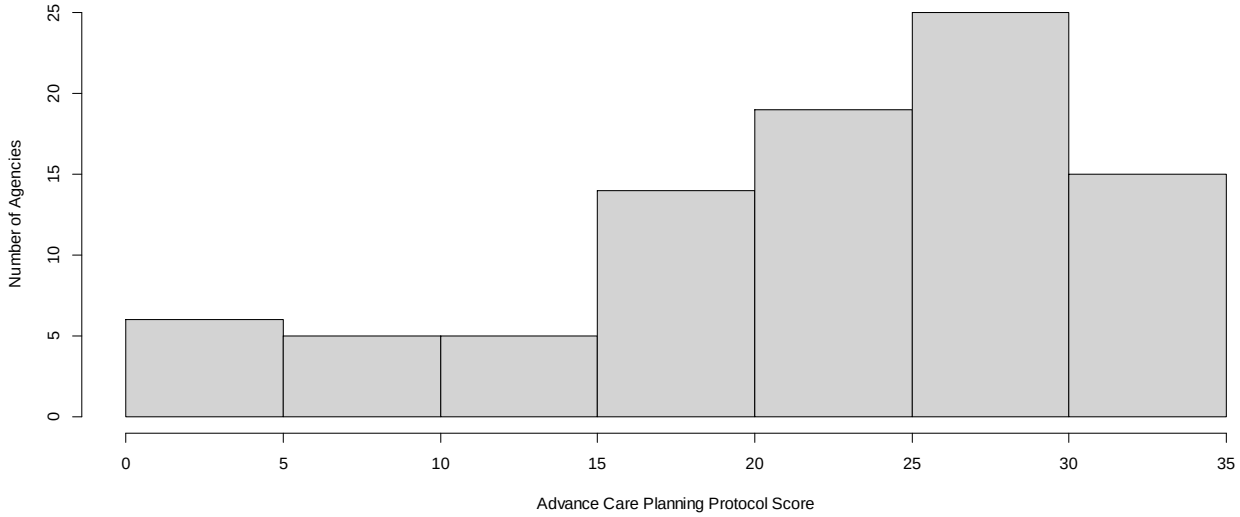
ACPP Score Items: Ns, Means, and Standard Deviations

ACPP score item name	N	Mean	Standard Deviation
Gather ACP data	89	2.92	1.79
Written ACP protocols	89	3.06	1.71
% of staff trained	89	2.36	1.65
ACP training funded by agency	89	1.71	1.99
Clinician documentation of ACP	89	3.19	1.62
Number of disciplines documenting ACP	89	3.91	2.04
Proportion of patients offered ACP	89	3.33	1.44
Practice modeled off existing framework	89	1.87	1.69

The lowest mean (1.71) found in the ACPP Score was in the ACP training funded by the agency. The highest mean (3.91) was in the number of disciplines documenting ACP, which also held the highest standard deviation (2.04). The lowest standard deviation (1.44) was found in the proportion of patients offered ACP. The distribution of ACPP scores appears in Figure 5.

Figure 5

Distribution of ACPP Scores



The distribution of ACPP scores was skewed to the right. More agencies scored higher than lower. Table 8 shows descriptive statistics for ACPP scores for HHVBP and non-HHVBP states. There were about twice more agencies in HHVBP states (n = 62) than in non-HHVBP states (n = 27), though their mean, median, minimum, and maximum scores were similar.

Table 8

HHVBP Participation and ACPP Scores

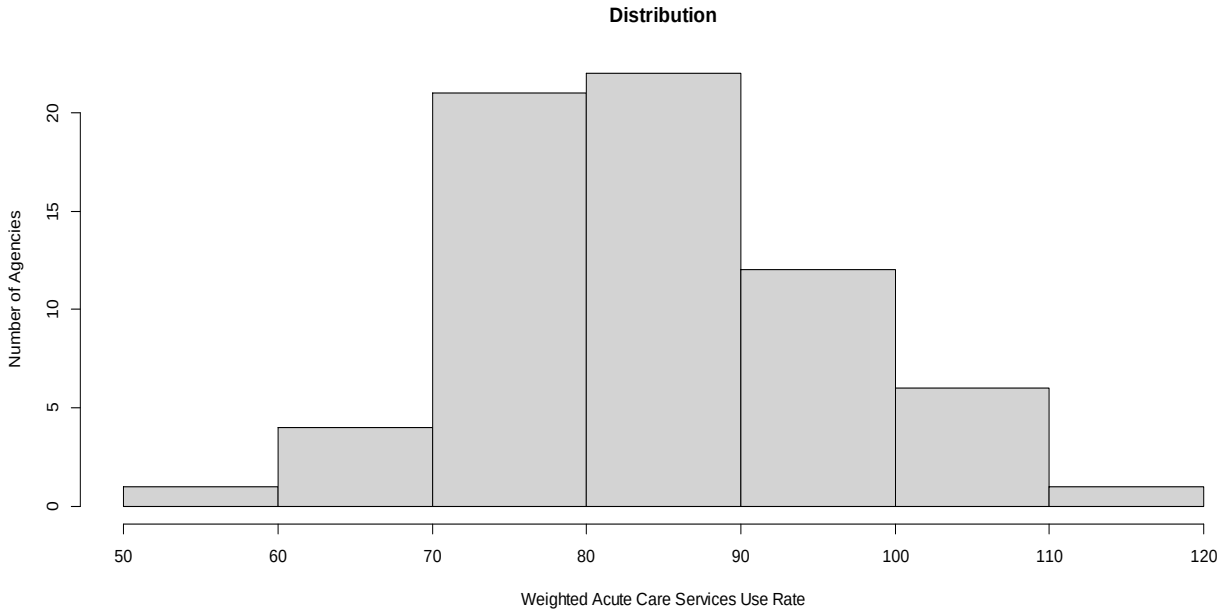
	N	Mean	Median	Minimum	Maximum	SD
HHVBP	62	23.77	25	0	34	7.6
Non-HHVBP	27	19.04	20	0	32	10.58

Description of WACSUR Score

The N for the WACSUR score was 67 due to missing data. The mean WACSUR score was 83.44. The lowest WACSUR score was 54.76 and the highest was 112 (Table 7). Figure 6 shows the distribution of the WACSUR scores.

Figure 6

Distribution of WACSUR Scores



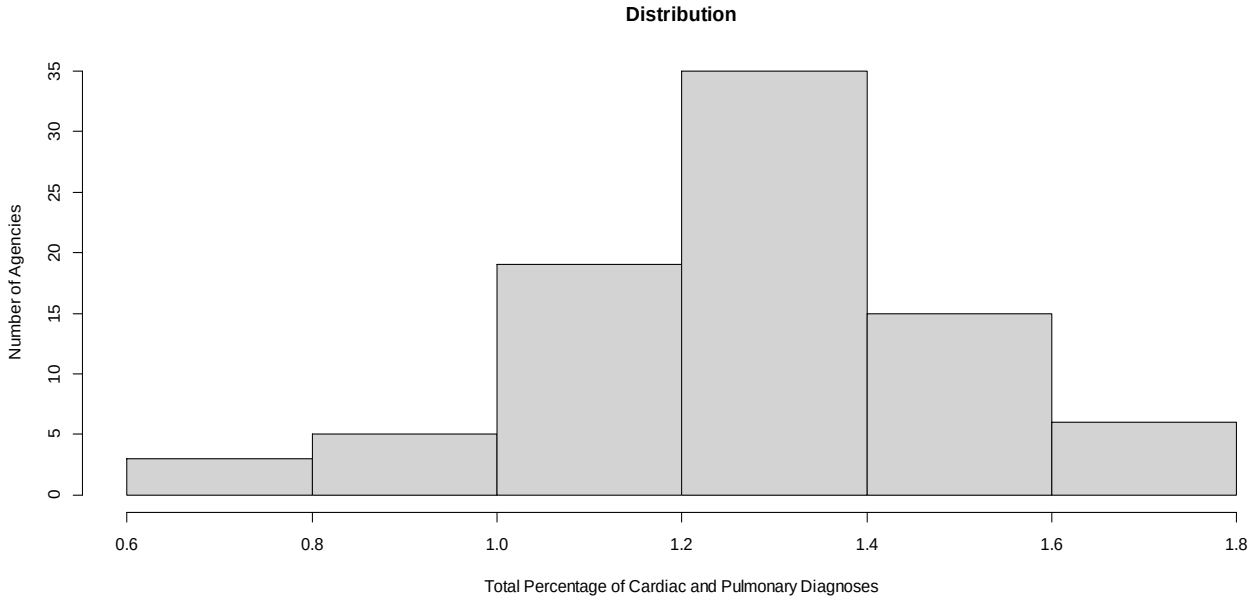
The distribution of the WACSUR scores was relatively normal. Most agencies scored between 70 and 90.

Description of TPCP Score

The TPCP (total percentage of cardiac and pulmonary diagnoses) included agency percentages for diagnoses of atrial fibrillation (AFib), congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and asthma. These four diagnoses were aggregated to make the TPCP for each HHA. Descriptive statistics appear in Table 9. The distribution of the TPCP score appears in Figure 7.

Figure 7

Distribution of TPCP Scores



The distribution of TPCP scores was slightly skewed to the right. Most agencies scored between 1.2 and 1.4.

Table 9

Descriptive Statistics for ACPP, WACSUR, and TPCP Scores[1]

Score Name	N	Mean	Median	SD	Skew
ACPP	89	22.34	25	8.83	-1.01
WACSUR	67	83.44	82.12	11.67	0.21
TPCP	83	1.27	1.3	0.22	-0.33

[1]All counts and percentages are based on valid (non-missing) data.

Hypothesis Testing

Table 10 lists the hypotheses and their results.

Table 10

Hypotheses and Results

#	**Hypothesis**	**Group**	**Significance or Trend**	**Result**
H1	↑ACPP = ↓Hosp	All	Significance	↑ACPP = ↑Hosp
		Non-HHVBP	Significance	↑ACPP = ↑Hosp
H2	↑ACPP = ↓Rehosp	All	None	ACPP ≠ Rehosp
		Non-HHVBP	None	ACPP ≠ Rehosp
H3	↑ACPP = ↓ED	All	None	ACPP ≠ ED
		Non-HHVBP	Trend	ACPP = ↓ED
H4	HHVBP = ↑ACPP	All	Significance	HHVBP = ↑ACPP
H5	↑TPCP = ↑Hosp ↑TPCP = ↑Rehosp ↑TPCP = ↑ED	All	Trend None None	↑TPCP = ↑Hosp TPCP ≠ Rehosp TPCP ≠ ED
H6	↑Age = ↑ACPP ↑Age = ↑WACSUR	All	Trend None	↑Age = ↑ACPP Age ≠ WACSUR
H7	↑Black = ↓ACPP ↑Black = ↓WACSUR ↑Black = ↓Hosp	All	None None Trend	Black ≠ ACPP Black ≠ WACSUR ↑Black = ↑Hosp
H8	NE Region = ↑ACPP NE Region = ↑WACSUR	All	None	Region ≠ ACPP Region ≠ WACSUR
H9	FP Ownership = ↑ACPP FP Ownership = ↓WACSUR	All	None Trend	Ownership ≠ ACPP Gov. Own = ↑WACSUR
H10	↑TPCP = ↓ACPP	All	Significance	↑TPCP = ↑ACPP

The first hypothesis (H1) was that higher ACPP scores are correlated with lower hospitalization rates. The Spearman correlation coefficient was $r = 0.22$, which was statistically significant at $p < 0.05$ ($S = 45364$, $p = 0.026$, one-tailed). The association between ACPP scores and hospitalization rates means that higher an agency's ACPP score the greater the tendency of a high hospitalization rate. Hypothesis H1 was rejected.

When the variable was controlled to include agencies in non-HHVBP states only, the Spearman correlation coefficient was even higher and also statistically significant (r =0.39, S=1592, p= 0.028, one-tailed). This means that among non-HHVBP agencies only, there is a stronger association between ACPP scores and hospitalization rates than in the sample as a whole with higher scores linked to higher hospitalization rates. This is in the opposite direction of hypothesis H1, so the null hypothesis cannot be rejected.

The second hypothesis (H2) was that higher ACPP scores are correlated with lower rehospitalization rates. The Spearman correlation coefficient was $r = 0.09$. This is not statistically significant because p was greater than 0.05 ($S = 45364$, $p = 0.22$, one-tailed). Hypothesis H2 was rejected.

When the variable was controlled to include agencies in non-HHVBP states only, the findings were similar. The Spearman correlation coefficient was r =0.14 ($S = 1982$, $p = 0.26$, one-tailed). This means that among non-HHVBP agencies, there is neither statistical significance nor a trend between ACPP scores and rehospitalization rates either in all agencies surveyed or only those in HHVBP states. The null hypothesis for H2 cannot be rejected.

The third hypothesis (H3) was that higher ACPP scores are correlated with lower ED use rates. The Spearman correlation coefficient was $r = 0.01$. This is not statistically significant because p is greater than 0.05 (S=62804, $p = 0.47$, one-tailed). When the variable was controlled

to include agencies in non-HHVBP states only, the Spearman correlation coefficient was negative (r = -0.18, S=3062), and the one-tailed p was lower (0.20) than for all agencies together. This means that among non-HHVBP agencies, there is a slight trend between ACPP scores and lower ED use rates; but among all agencies surveyed there was not a trend between ACPP scores and ED use rates.

When imputed data was used as described in the methods section, for hospitalization and ACPP scores the Spearman Correlation coefficient was r = 0.24 (S = 83882, p = 0.014, one-tailed); for rehospitalization and ACPP scores, r = 0.14 (S = 78903, p = 0.10, one-tailed); and for ED use and ACPP scores, r = 0.08 (S = 101390, p = 0.24, one-tailed). The addition of the imputed data further validates all of the findings above of a positive association of ACPP scores with hospitalization rates, a trend with ED rates, but not with rehospitalization rates.

The fourth hypothesis (H4) was that HHAs in HHVBP states will have higher ACPP scores. The Kruskal-Wallis value was chi-squared = 10.86 and p = 0.0005. This is statistically significant because p is less than 0.05. The lowest mean (19.04) was in non-HHVBP states. The median for HHVBP states was 25, and for non-HHVBP it was 20. The N (27) for non-HHVBP states was roughly less than half that of the N (62) for HHVBP states. These findings indicate that HHAs in HHVBP states were more likely to have robust ACP protocols.

The fifth hypothesis (H5) was that higher TPCP scores are correlated with higher hospitalization rates, higher rehospitalization rates, and higher ED use rates. The Spearman correlation coefficient for TPCP and hospitalization was r = 0.16 (S = 47763, p = 0.09, one-tailed). The Spearman correlation coefficient for TPCP and rehospitalization was r = 0.08 (S = 47511, p = 0.47, one-tailed). The Spearman correlation coefficient for TPCP and ED use was r = 0.03 (S = 55366, p = 0.40, one-tailed). None of these was statistically significant because each

had *p* greater than 0.05. Although H5 is rejected, since *p* for TPCP and hospitalization was 0.09, there is a trend in these measures. That is, the higher number of patients with cardiac and pulmonary diagnoses, the greater the tendency of a high hospitalization rate.

The sixth hypothesis (H6) was that HHAs with higher average patient ages will have higher ACPP scores and higher WACSUR scores. The Spearman correlation coefficient for ACPP and age was $r = 0.12$ ($S = 83368$, $p = 0.13$, one-tailed). The Spearman correlation coefficient for WACSUR and age was $r = -0.08$ ($S = 51718$, $p = 0.26$). Neither of these is statistically significant because *p* for each is greater than 0.05. However, again, since *p* for ACPP and age (0.13) was less than 0.2, there is a trend. That is, the higher the average age of patients, the greater the tendency of an agency having a more robust ACP protocol.

The seventh hypothesis (H7) was that HHAs with higher proportions of Black patients will have lower ACPP scores and lower WACSUR scores. For ACPP and proportion of Black patients, the Spearman correlation coefficient was $r = -0.05$ ($S = 26039$, $p = 0.36$, one-tailed). Since *p* was greater than 0.05, this is not statistically significant. No relationship was found between ACP protocols and the proportion of Black population per agency. For WACSUR and proportion of Black patients, the Spearman correlation coefficient was $r = 0.019$ ($S = 11261$, $p = 0.45$, one-tailed), likewise not statistically significant. Hypothesis H7 is therefore not accepted. The null hypothesis could not be rejected.

When the acute care measure was isolated for only hospitalization rate and race, the Spearman correlation coefficient was $r = 0.07$ ($S = 12252$, $p = 0.15$, one-tailed). Since *p* is less than 0.2, there is a trend in hospitalization and race in this study: The greater proportion of Black patients, the greater the tendency for an agency to have a higher hospitalization rate. Both the WACSUR and the hospitalization findings, as related to agency proportion of Black patients,

contradict Osakwe's (2020) findings that HHAs serving a 50% or more Black population were at a decreased risk of acute care hospitalization.

The eighth hypothesis (H8) was that HHAs in the Northeast region have higher ACPP scores and lower WACSUR scores. For region and ACPP, the Kruskal-Wallis chi-squared was 3.41, and *p* was 0.40. This is not statistically significant. For region and WACSUR, the Kruskal-Wallis chi-squared was 6.0934, and *p* was 0.215. This is not statistically significant. The results of the WACSUR Scores by region appear in Table 10. The highest WACSUR mean (88.21) and median (90.16) were in the Plains region, and the lowest mean (77.45) was in the Far West region. The lowest WACSUR median (77.9) was in the Southwest region.

Table 11

WACSUR Scores by Region[1]

Region	N	Mean	Median	Minimum	Maximum	SD
Far West	5	77.45	78.12	63.92	85.68	8.26
Mid-East	3	80.76	82.08	77.86	82.34	2.51
Northeast	9	85.45	85.1	72.32	95.56	7.65
Plains	11	88.21	90.16	62.86	104.92	12.73
Southeast	31	82.42	81.62	54.76	112	13.23
Southwest	8	83.34	77.9	71.54	97.6	10.97

[1]All counts and percentages are based on valid (non-missing) data.

Agency ACPP scores were grouped by geographical region (FW: West Coast and Rocky Mountains; ME: Mideast; Plains: PLNS; Southeast: SE; and Southwest SW). They appear in Table 11. The largest N (40) came from the Southeast region (Florida, Georgia, North Carolina, and Tennessee), and the smallest N (3) came from the Mideast. The greatest mean (22.42) came from the Northeast (NE) and the lowest mean (19.33) came from the Mideast.

Table 12

Descriptive Statistics of ACPP Scores by Region[1]

Region	N	Mean	Median	SD

Far West (FW)	5	23	22	7.58
Mideast (ME)	3	19.33	19	9.5
Northeast (NE)	12	22.42	25.5	8.51
Plains (PLNS)	17	24	25	5.29
Southeast (SE)	40	22.18	26	10.62
Southwest (SW)	12	20.92	23.5	7.98

[1]All counts and percentages are based on valid (non-missing) data.

Acute care services were then broken down into hospitalization, rehospitalization, and ED use by region: For hospitalization and region (Table 13), the Kruskal-Wallis chi-squared was 7.53 and *p* was 0.095; for rehospitalization and region (Table 14), *p* was 0.15; and for ED use and region (Table 15) *p* was 0.42. None of the findings about the relationship between region and acute care services use was statistically significant. However, there is a trend between region and hospitalization and region and rehospitalization.

Table 13

Hospitalization Rates by Region[1]

Region	N	Mean	Median	Minimum	Maximum	SD
Far west	5	13.94	14.6	10.3	16.5	2.33
Mideast	3	15.23	14.9	14.8	16	0.67
Northeast	9	16.31	16.3	13.3	18.8	1.97
Plains	12	17.25	17.7	10	21.8	3.3
Southeast	33	15.15	15.2	1.6	23.8	3.99
Southwest	10	14.84	14.6	10.9	19.2	2.93

[1]All counts and percentages are based on valid (non-missing) data.

The greatest hospitalization rate means were in the Plains region (17.25) and the Northeast region, and the lowest mean (13.94) was in the far west. These areas deviated the most from the overall average. Therefore, they are the most likely cause for the trend. The lowest hospitalization rate median (14.6) was found both in the far west and southwest regions.

Table 14

Rehospitalization Rates by Region[1]

Region	N	Mean	Median	Minimum	Maximum	SD

Far West	5	3.43	3.31	2.71	4.8	0.81
Mideast	3	3.05	2.93	3.29	0.37	0.21
Northeast	9	3.32	3.33	2.64	3.94	0.44
Plains	11	3.51	3.58	2.69	4.41	0.52
Southeast	31	3.53	3.41	4.99	1.95	0.43
Southwest	8	3.33	3.34	2.85	3.75	0.29

[1]All counts and percentages are based on valid (non-missing) data.

The highest rehospitalization means were in the Southeast region (3.53) and Plains region (3.51). The lowest rehospitalization mean (3.05) was in the Mideast region. These deviations from the overall average were the likely cause of the trend. The highest rehospitalization median (3.58) was in the Plains region, and the lowest median (2.93) was in the Mideast region.

Table 15

Emergency Department Use Rates by Region[1]

Region	N	Mean	Median	Minimum	Maximum	SD
Far West	5	14.82	14.6	13	16.7	1.83
Mideast	3	13.73	12.8	12.5	15.9	1.88
Northeast	9	13.57	13.3	10.2	17.1	2.36
Plains	12	13.53	13	9.9	20.7	3.45
Southeast	33	12.97	12.2	6.8	19.5	3.68
Southwest	10	13.86	13.4	8	19.8	3.47

[1]All counts and percentages are based on valid (non-missing) data.

The highest ED use mean (14.82) was in the Far West region, which also had the highest median (14.6). The lowest ED use mean (12.97) was in the Southeast region, which also held the lowest median (12.2).

The ninth hypothesis (H9) was that for-profit HHAs will have higher ACPP scores and lower WACSUR scores. For status and ACPP, the Kruskal-Wallis chi-squared was 0.07, and *p* was 0.20. For status and WACSUR, the Kruskal-Wallis chi-squared was 2.27, and *p* was 0.16. Neither of these was statistically significant because each one's *p* was greater than 0.05. However, there is a trend between status and WACSUR. Since the for-profit and non-profit

agencies had similar means and the governmental agencies had a distinct mean, this was the likely cause of the trend.

Table 16

WACSUR Scores by Ownership Status[1]

Ownership Status	N	Mean	Median	Minimum	Maximum	SD
For profit	43	82.8	81.62	54.76	105.38	11.89
Non-profit	19	82.94	82.26	62.62	112	11.24
Governmental	5	90.88	90.16	77.14	103.16	10.81

[1]All counts and percentages are based on valid (non-missing) data.

The highest mean (90.88) and median (90.16) were in government-owned agencies. The means and medians of for-profit and non-profit agencies were comparable.

Table 17

ACPP Score by Ownership Status[1]

Ownership Status	N	Mean	Median	Minimum	Maximum	SD
For profit	59	22.14	25	0	34	9.31
Non-profit	22	22.23	23.5	0	34	8.68
Governmental	8	24.12	24	18	31	5.59

[1]All counts and percentages are based on valid (non-missing) data.

As in the WACSUR scores, the for-profit and non-profit means were similar for the ACPP scores, while the government-owned agencies had a distinct mean. The highest ACPP score mean (24.12) was in government-owned agencies. The highest median ACPP score was in for-profit agencies. Both for-profit and non-profit agencies had a minimum score of zero for ACPP, while government-owned agencies had a minimum score of 18, which likewise probably contributed to the trend.

The tenth hypothesis was that HHAs with higher TPCP scores have lower ACPP scores. The Spearman correlation coefficient was $r = 0.22$ (S = 74684, $p = 0.025$, one-tailed), which

was statistically significant. The greater percentage of patients with chronic cardiac and pulmonary diagnoses, the greater the tendency there is to have more robust ACP protocols. Hypothesis H10 is rejected.

Chapter Summary

The typical respondent to the ACPP survey was in some kind of leadership role at a for-profit HHA participating in HHVBP. The bulk of respondents reported from the southeast region. Overall, the sample scored high means on the number of disciplines having capacity to document ACP conversations (3.91) and the proportion of patients offered ACP (3.33); and scored low on funding ACP training for the staff (1.71) and modeling their ACP practice off an existing framework (1.87).

All hypotheses were rejected except H4, that agencies in HHVBP states would have higher ACP scores. This hypothesis was accepted and served as a test of instrument validity. There were two other statistically significant results whose correlations were in opposite directions than expected: H1 and H10. H1 hypothesized that the greater an agency's ACPP score, the lower its hospitalization rates would be. However, the results of H1 demonstrated the opposite: that the greater an agency's ACPP score, the higher its hospitalization rates were. This was an unexpected finding. Likewise, H10 hypothesized that the higher an agency's TPCP score, measuring the total percentage of patients with chronic cardiac and pulmonary illnesses, the lower the ACPP score would be. Instead, the results showed the opposite, that the higher the TPCP score, the higher the ACPP score. H1 and H10 were statistically significant, however the direction of the correlations was opposite of the hypotheses.

Several trends were noted. In H3, among non-HHVBP agencies, there was a slight trend between higher ACPP scores and lower ED use rates. However, among all agencies, there was

no such trend. In H5, the higher an agency's TPCP score, the higher the hospitalization rate tended to be. In H6, there was a trend between increased average age of patients and higher ACPP scores. In H7, a slight trend was noted between increased proportion of Black patients and increased hospitalization rates.

Chapter 5. Discussion

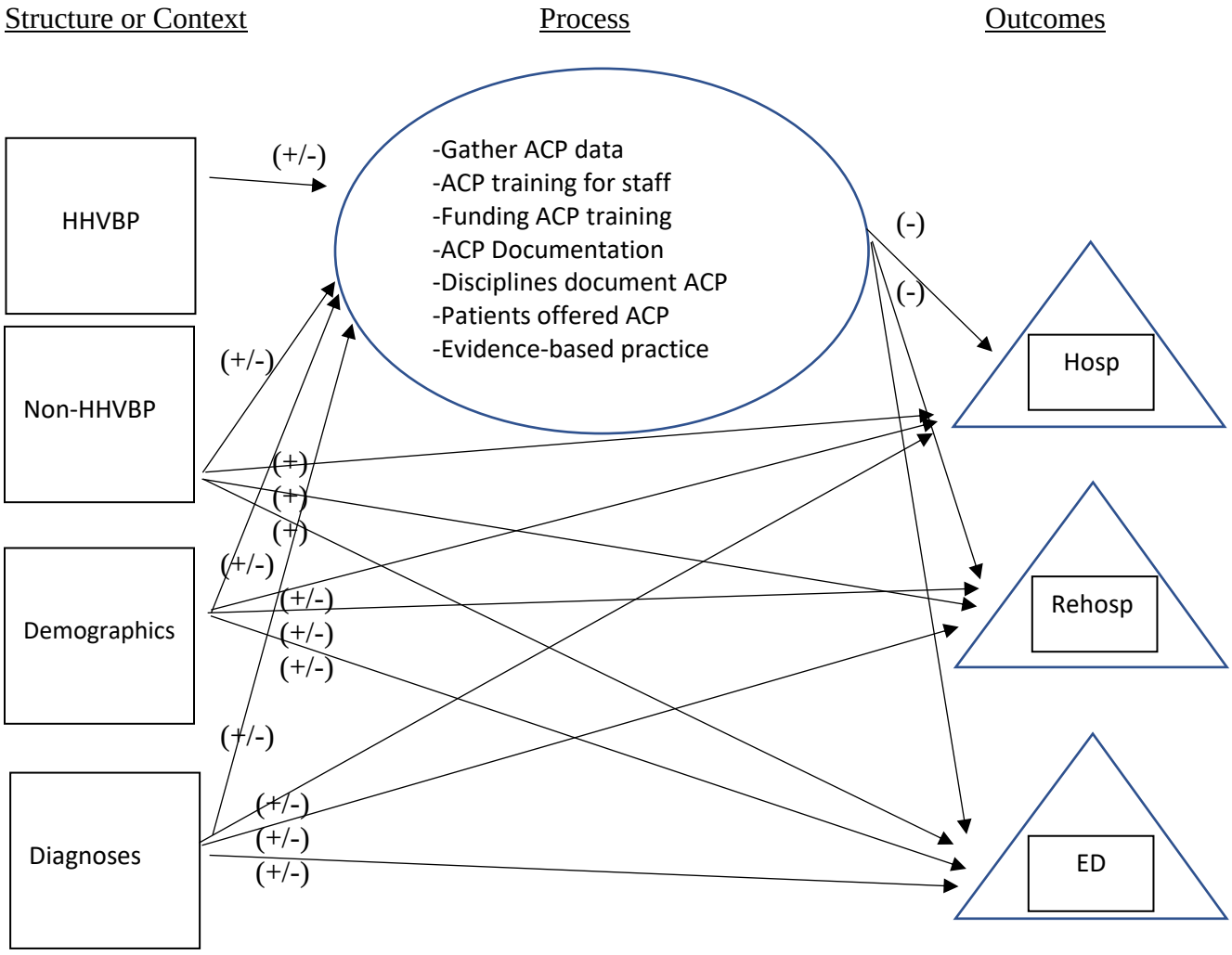
The following chapter is a discussion of the results as related to current literature. The fitness of the SPO model is discussed in detail, with a revised model provided. Implications for healthcare in general and nursing in particular are discussed. Recommendations for future research are provided. Limitations of the study are identified and explained.

Fitness of Model

The initial model included the structural aspects of "ACP Protocols" and "No ACP Protocols". However, in the course of analysis it became apparent that ACP protocols existed on a continuum, as no agency could be described as having no protocol. In addition, CMS rightly identified ACP as a process measure, not a structure or outcome measure. The current study fleshed out ACP processes in terms of the ACPP score, where agencies scored high, medium, or low depending on the aspects that fit their processes. For this reason, it can be said that ACP processes and protocols exist on a continuum rather than existing or not existing. Therefore, the model should include "HHVBP" and "Non-HHVBP" as structural aspects instead of "ACP Protocols" and "No ACP Protocols" as depicted in Figure 8. Likewise, hypothesis tests regarding demographics and diagnoses as related to ACP protocols are now depicted by arrows pointing to the process area of the model instead of pointing to structural areas. In addition, since all agencies had some degree of ACP protocols, a +/- sign now appears next to both HHVBP and non-HHVBP structures.

Figure 8

Revised Statistical Model



Summary of Results

As noted, all hypotheses were rejected except H4: that agencies in HHVBP states would have higher ACP scores. This was an expected outcome since CMS requires HHAs in HHVBP states to report on ACP, while agencies in non-HHVBP states are not required to do so. This served as a test of instrument validity.

There were two other findings that were statistically significant yet unexpected: H1 and H10. H1 hypothesized that the greater an agency's ACPP score, the lower its hospitalization rates would be. However, the results of H1 demonstrated the opposite: that the greater an agency's ACPP score, the higher its hospitalization rates were. This was an unexpected finding and is discussed below. Likewise, H10 hypothesized that the higher an agency's TPCP score, measuring the total percentage of patients with chronic cardiac and pulmonary illnesses, the lower the ACPP score would be. Instead, the results showed the opposite, that the higher the TPCP score, the higher the ACPP score. H1 and H10 were statistically significant, however the direction of the correlations was unexpected. Further, several trends were noted and are discussed below under Specific Aim I and Specific Aim II.

Specific Aim I

The first specific aim was to determine if advance care planning protocols (ACPP) and total percentage of cardiac and pulmonary diagnoses (TPCP) are correlated with increased acute care hospital services use rates. There was a trend noted in agencies' increased total percentage of cardiac and pulmonary diagnoses having a tendency toward higher hospitalization rates. Further, an unexpected finding was that there was statistical significance showing a correlation between increased ACPP scores and increased hospitalization rates. In reality, this may be due to effective ACP protocols. That is, if an agency is effectively engaging with patients in a coordinated way about their wishes, patients may either (a) refuse admission to home health and opt for an alternative service such as an assisted living facility (ALF) or home hospice; or (b) be admitted to home health at first but then be transferred or discharged to another service when appropriate. Currently, CMS does not track at an aggregate level the patients who are diverted or discharged to ALFs or hospice. However, the *Third Annual Report of the Evaluation of the*

Home Health Value-Based Purchasing Model (2020) measured the rate of transfers to skilled nursing facilities (SNF) and found that the rates declined among HHVBP agencies overall.

Further, the report found that HHVBP may have an unintended impact on agency selection of less sick patients. The researchers found that in all HHVBP states, except Tennessee and Florida, the reported level of patient acuity at the start of care, as measured by the hierarchical condition category (HCC), increased overall since the start of the program in 2016. The report suggested that agencies in Tennessee and Florida may engage in patient selection in order to obtain a favorable risk profile that would enable them to obtain better outcomes. This was specifically identified as an unintended effect of the HHVBP program, implying to some extent that agencies in these two states were gaming the system. However, what it may mean in reality is that agencies with lower HCC scores at the start of care are actually being effective at assessing patients' appropriateness for the home health service. Thus, sicker patients may be diverted or transferred to different service lines when needed. In fact, OASIS requires agencies to report as part of the HCC at the start of care an indicator of fragile health, and state the criterion of, "Ongoing risk of serious complications and death or a serious progressive condition that could lead to death in a year" (Arbor Research Collaborative, 2020, p. 33). Thus, if an agency as a more robust ACPP protocol, it might be more effective at selecting patients appropriate for home health as well as diverting or transferring patients to other appropriate services instead. ALF provides more support than home health alone, and hospice provides 24/7 access to urgent care at home as an alternative to the emergency room: Home health agencies may be left with a population of patients who need to use the hospital in case of crisis. This may explain the relationship between high ACPP scores and high hospitalization rates.

The second part of Specific Aim I was to measure the relationship between total cardiac and pulmonary percentage (TPCP) and acute care services use. There was a trend indicating that the greater the TPCP score, the greater the hospitalization rate, but not rehospitalization or ED use. This means that the more patients an agency has with chronic cardiac and pulmonary conditions such as CHF, atrial fibrillation, COPD, and asthma, the greater the tendency there is for increased hospitalizations. This may speak to the need among patients with these diagnoses for (a) enhanced symptom management at home and/or (b) the implementation of ACP tools tailored to these populations. Nishikawa et al. (2020) conducted a meta-analysis of advance care planning for adults with heart failure and found that the quality of evidence about outcomes was low due to the small number of studies. They recommend future studies to explore the effects of ACP among patients with heart failure.

Specific Aim II

The second specific aim was to determine whether the demographic and diagnostic profiles of the HHAs are correlated with ACPP and acute care services use (WACSUR: weighted acute care services use rates score).

There was a trend found in the higher the average age of patients, the greater the tendency was for an agency to have a more robust ACP protocol (H6), but there was no relationship between average age and acute care services use (H6).

The seventh hypothesis was that HHAs with higher proportions of Black patients will have lower ACPP scores and lower WACSUR scores. There was no relationship found between the WACSUR score and race. However, when the WACSUR acute care measure was isolated for hospitalization only and race, a trend was found. This means that the greater proportion of Black patients, the higher the agency's hospitalization rate tended to be. Both the WACSUR and the

hospitalization findings, as related to agency proportion of Black patients, contradict Osakwe's (2020) findings that HHAs serving a 50% or more Black population were at a decreased risk of acute care hospitalization.

Likewise contradicting Osakwe's (2020) findings were the results of the eighth hypothesis regarding region and acute care services use. None of the findings about the relationship between region and acute care services use were statistically significant. These findings contradict Osakwe's (2020) findings that agencies in the Midwest, South, and West had lower odds of acute care hospitalization as compared with HHAs in the Northeast; and that ED visit rates were higher in the South and West as compared to the Northeast.

There was no relationship found between region and ACPP scores. This indicates that no one region over other regions has any significant difference or trend in robustness of ACP protocols.

The ninth hypothesis: For-profit HHAs will have higher ACPP scores and lower WACSUR scores. No relationship was found between ownership status and ACPP. However, a trend was found between ownership status and WACSUR: government-owned agencies tended to have a higher WACSUR score. This means that patients of government-owned home health agencies tended to use acute care services more. The ownership status relationship with WACSUR finding here contradicts Osakwe's (2020) finding that for-profit status is associated with lower acute care hospitalization and lower ED use rates.

Finally, H10 was statistically significant: the greater an agency's total percentage of patients with chronic cardiac and pulmonary diseases, the greater their ACPP scores. This was an unexpected finding. However, it may mean that agencies with robust ACP protocols are diverting patients with serious or terminal illnesses such as cancer, end stage renal disease, and

dementia to more appropriate service lines, thus leaving the agencies with greater percentages of patients with chronic cardiac and pulmonary illnesses. It may also mean that ACP tools tailored to populations with chronic illnesses need to be implemented. This is an area for future research.

Implications for Healthcare

With the growing the population of older adults living longer with chronic illnesses, it is understandable that institutions like the IOM and Medicare are recommending and implementing standards to manage changing healthcare needs and to control costs. Greater collaboration is needed along the healthcare continuum to move beyond a treat-them-and-street-them approach to healthcare. In order to prevent unwanted treatments and truly tailor plans of care to patients' self-defined quality of life, healthcare representatives from all services lines must recognize that (a) patients are people first; (b) patients can receive good quality healthcare in a variety of environments; and (c) the onus is upon all healthcare providers to provide the right care at the right time. Communication competency regarding advance care planning should be integrated into all health professions' educational curricula, in both prelicensure environments and continuing education.

Implications for Nursing Practice

As the literature supports, ACP conversations are a part of nursing practice. Nurses should not assume that patients have had conversations about their goals of care with their physicians or families. ACP should be integral to nursing care. As one survey respondent commented, "Care of patients in the home should always involve advance care planning as that's the bedrock of true case management." If nurses want to tailor the plan of care to each unique patient, ACP should not be excluded. Nurses should collaborate with agency leadership to find

ACP tools tailored toward different diagnostic populations in order to meet their patients' needs adequately.

Recommendations for Future Research

Currently, the HHVBP *Third Annual Report* (2020) lists the "Advance Care Plan" measure as a literal footnote, indicating its supposed lack of importance. However, in the section on qualitative responses regarding strategies to improve acute care services use outcomes, ACP is alluded to. One key strategy listed there is to improve care transitions management: "When home health is no longer the best option for a patient, agencies helped them to transition to places such as hospice, SNFs, and assisted living. Staff would have conversations with patients on their patient-centered goals to determine if they may want to transition to hospice" (Arbor Research Collaborative, 2020, p. 111). Since this has been named by respondents as a key strategy, in future reports ACP should be elevated from a footnote to a concrete measure. This would respond to the IOM's Recommendation 2: "Professional societies and other organizations that establish quality standards should develop standards for clinician-patient communication and advance care planning that are measurable, actionable, and evidence-based…" (IOM, 2015, p. 12).

Further, CMS should track HHA referral rates to ALF and home hospice in addition to the currently tracked SNF referrals. This would give a better idea of patient trajectories by expanding the focus beyond agency outcomes to patient outcomes. HHVBP incentivizes HHAs to innovate programs to obtain better outcomes, but the current scope is limited.

Next, future research should study the effects of pandemics on HH utilization as well as on acute care services use.

Limitations

The study has various limitations. First, the study is limited by the fact that data were collected at different time points. This is because all data except that from the ACPP survey were collected by CMS according to its time parameters.

The study is also limited by the sample size of HHAs in 18 states. For some states, fewer than 5 agencies responded and cannot be assumed to represent agencies in an entire state. Further, it cannot be assumed that respondents to the survey were representative of the entire sample or population. There was a disproportionate number of respondents from the southeast region, and it cannot be assumed that the sample from this region represents the entire region nor the entire population. Some agency representatives reported that their legal departments prevented them from responding to the survey; thus, the study is limited to those agencies who were not under such legal restrictions.

Further, there was no discernment on the part of the researcher about agency size, age, or franchise status when administering the ACPP survey. However, CMS reported missing data when agencies had too few incidents of hospitalization, rehospitalization, or emergency department use, or were too young to qualify for such reporting. This limited the study in that the ACPP variable was full (N = 89) but other variables had some missing data, making correlation difficult. Regarding franchise status, agencies with multistate offices were not identified; thus, identical ACPP protocols may have been reported by agencies in different states. Finally, the study was limited by the fact that agencies were free to develop their own unique ACP protocols, if any, and the survey instrument may not have captured all the aspects of them.

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APPENDICES

Appendix A: HHVBP Performance Measures

Measure	Measure Type	Data Source
Emergency Department (ED) Use without Hospitalization*	Outcome	Medicare claims
Unplanned Acute Care Hospitalization (ACH)**	Outcome	Medicare claims
Improvement in Bathing**	Outcome	OASIS
Improvement in Bed Transferring**	Outcome	OASIS
Improvement in Ambulation-Locomotion**	Outcome	OASIS
Improvement in Dyspnea**	Outcome	OASIS
Improvement in Management of Oral Medications*	Outcome	OASIS
Improvement in Pain Interfering with Activity**	Outcome	OASIS
Discharged to Community	Outcome	OASIS
Influenza Immunization Received for Current Flu Season**	Process	OASIS
Pneumococcal Polysaccharide Vaccine Ever Received*	Process	OASIS
Drug Education on Medications Provided to Patient/ ** Caregiver during Episodes of Care8	Process	OASIS
How often the home health team gave care in a professional way [Composite Measure]**	Outcome	HHCAHPS
How well did the home health team communicate with patients [Composite Measure]**	Outcome	HHCAHPS
Did the home health team discuss medicines, pain, and home safety with patients [Composite Measure]**	Outcome	HHCAHPS
How do patients rate the overall care from the home health agency [Global Measure]**	Outcome	HHCAHPS
Would patients recommend the home health agency to friends and family [Global Measure]*	Outcome	HHCAHPS

Measure	Measure Type	Data Source
Influenza Vaccination Coverage for Home Health Care Personnel	Process	HHA Self-report
Herpes Zoster (Shingles) Vaccination for Patient	Process	HHA Self-report
Advance Care Plan	Process	HHA Self-report

Source: CY 2017 Final Rule (FR) (HHS, 2016), (CMS, 2017)
*Publicly reported on HHC
** Publicly reported on HHC and included in the CMS Star Ratings

Appendix B: Recruitment Calls & Mailing Log

Date	**Time**	**Hours**	**State(s) Called**	**# of HHAs Called**	**Comments**
7/31/20	9:30am-12:30am	3	AR	80	
7/31/20	1:15pm-4:15 pm	3	CT	75	
8/4/20	9:30 – 12:00	2.5	CT, DE, FL	48	Storm in DE
8/4/20	1:00-3:15pm	2.25	FL	72	
8/4/20	3:15 pm–4:00 pm	.75	IA	20	
8/6/20	1:00-3:30	2.5	AZ, MO, KS	44	Calculating numbers too
8/7/20	12:15-1:30 pm	1.25	NM, WA, ED, GA	28	
8/7/20	2:15-2:45 pm	.5	NC	17	
8/7/20	3:00-3:30	.5	TN	13	
8/7/20	3:30-3:45	.25	NE	7	
8/11/20	10:40-11:00	.25	MD, DE	8	
8/11/20	11:00-12:00	1	MA, TX	26	Many voicemails
8/12/20	12:15 – 1:15	1	TX	29	
8/12/20	2:15-2:35	.25	TX	10	
8/15/20	Sent letters	NA	All except MD, DE, MA, TX, & FL	NA	
8/17/20	Sent letters	NA	MD, DE, MA, TX, FL	NA	
9/15/20	Sent letters	NA	AR2	NA	
9/16/20	11:00-11:30	.5	CT2	9	
9/16/20	11:30-12:00	.5	GA2, DE2	13	
9/16/20	12:00-12:30	0.5	AZ2	17	
9/16/20	12:30-1:00	0.5	NM2	8	
9/16/20	2:00 – 2:45	.75	NC2	17	
9/16/20	3:00-4:30	1.5	MA2, MD2, NE2	38	
9/18/20	1:45-2:15	.5	TN2	13	
9/18/20	2:15-2:30	.25	ID2	5	
9/18/20	3:15-4:00	.75	WA2, MO2	21	
9/22/20	Sent letters	NA	TN2, ID2, WA2, MO2	NA	
9/22/20	11:30-11:45	.25	IA2	10	
9/22/20	12:00-12:30	.5	KS2	12	
9/22/20	2:00-4:00	2	FL2	63	
9/23/20	Sent letters	NA	FL2	NA	
9/23/20	11:30-12:30	1	TX2	25	
9/23/20	2:30-3:00	.5	TX2	17	
9/24/20	Sent letters	NA	TX2	NA	

Appendix C: Recruitment and Response Log, Round 1

State	Time Zone	HHVBP State? (twin for)	Total #HHAs	10% to call	# Called	# of email addresses obtained (% of calls)	Spoke to potential respondent	Mailed Letter	#Responded to Survey this round
AZ	Mountain	Yes	173	17	17	7 (41%)	1	7	0
AR	Central	No (TN)	97	10	97*	56 (58%)	3	10	4
CT	Central	Yes	85	9	85*	34 (40%)	1	9	5
DE	Eastern	No (MD)	27	3	3	2 (66%)	0	3	1
FL	Eastern	Yes	830	83	150*	33 (22%)	3	33	6
GA	Eastern	No (NC)	102	10	10	4 (40%)	0	4	1
ID	Mountain	No (WA)	48	5	5	3 (60%)	0	3	1
IA	Central	Yes	147	15	20*	11 (55%)	3	11	4
KS	Central	No (NE)	118	12	12	5 (41%)	1	5	3
MD	Eastern	Yes	52	5	5	1 (20%)	0	5	1
MA	Eastern	No (CT)	263	26	26	5 (19%)	0	5	1
MO	Central	No (IA)	150	15	15	6 (40%)	3	6	1
NE	Central	Yes	70	7	7	3 (43%)	0	3	1
NM	Mountain	No (AZ)	73	7	7	2 (28%)	0	2	1
NC	Eastern	Yes	173	17	17	8 (47%)	0	8	3
TN	Eastern	Yes	128	13	13	6 (46%)	1	6	2
TX	Central	No (FL)	431	43	43	22 (51%)	1	22	4
WA	Pacific	Yes	63	6	6	3 (50%)	0	3	2
TOT-ALS RND 1	**NA**	**9 and 9**	**2,902**	**290**	**525**	**211 (Av 42%)**	**16**	**139**	**41 (46%)**

* Called greater than 10% during Round 1. Adjusted # to call in Round 2 accordingly

Appendix D: Recruitment and Response Log, Round 2 and Grand Totals

State	Time Zone	HHVBP State? (twin for)	Total # HHAs	10% to call	# Called	# email addresses obtained (%)	Spoke to potential Respond-ent	Mailed Letter	# Responded to Survey this round
AZ	Mountain	Yes	173	17	17	11 (65%)	1	11	2
AR	Central	No (TN)	97	NA	NA *	56 (58%)	0	10	4
CT	Central	Yes	85	9	NA *	9 (100%)	0	9	4
DE	Eastern	No (MD)	27	3	3	2 (66%)	0	2	1
FL	Eastern	Yes	830	83	63*	28 (44%)	7	28	11
GA	Eastern	No (NC)	102	10	10	6 (60%)	0	6	1
ID	Mountain	No (WA)	48	5	5	2 (40%)	1	2	0
IA	Central	Yes	147	15	10 *	5 (50%)	1	5	2
KS	Central	No (NE)	118	12	12	8 (66%)	0	8	3
MD	Eastern	Yes	52	5	5	2 (40%)	1	2	0
MA	Eastern	No (CT)	263	27	27	8 (30%)	0	8	2
MO	Central	No (IA)	150	15	15	6 (40%)	0	6	2
NE	Central	Yes	70	7	7	2 (29%)	2	2	2
NM	Mountain	No (AZ)	73	7	8	6 (75%)	0	6	1
NC	Eastern	Yes	173	17	17	11 (65%)	0	11	5
TN	Eastern/ Central	Yes	128	13	13	4 (31%)	0	4	3
TX	Central	No (FL)	431	43	43	16 (37%)	2	16	4
WA	Pacific	Yes	63	6	6	2 (33%)	0	2	2
TOT-ALS RND 2	**NA**	**9 and 9**	**2,902**	**281**	**243**	**184 (50%)**	**15**	**136**	**48 (44%)**
GR. TOT-AL	**NA**	**9 and 9**	**2,902**	**571**	**768**	**395 (Av 46%)**	**31**	**275**	**89**

* Called greater than 10% during Round 1. Adjusted # to call in Round 2 accordingly

Appendix E: ACPP Survey

Data collected will be kept confidential. Advance care planning is a conversation about values, goals, beliefs, future treatment choices, and designation of a surrogate decision-maker, that someone has in advance of a health crisis. CMS is the Centers for Medicare and Medicaid.

1. What is the name of your home health agency?_____
2. In which state or U. S. territory is your home health agency? _____

3.What is the status of your home health agency?

a. For-profit b. Not-for-profit c. Governmental

2. What is your role in the home health agency?

a. Administrator/manager b. Direct-care clinician c. Data gatherer
d. other (please specify)_____

3. Does your agency participate in CMS's Home Health Value Based Purchasing model?

a. Yes b. No c. Don't know

4. Does your agency gather data about advance care planning conversations?

a. Yes b. No c. Don't know

5. Does your agency have written protocols or procedures concerning advance care planning?

a. Yes b. No c. Don't know

6. What approximate percentage of your current staff have undertaken training about advance care planning?

a. 76-100%
b. 51-75%
c. 26-50%
d. Less than 25%
e. Don't know

7. Was any ACP training funded by your agency?

a. Yes b. No c. Don't know

8. Does your agency currently provide a format for clinicians to document in the health record patients' wishes about the care they would like to receive, in case they are no longer able to make decisions about their health for themselves (i.e., advance care planning)?

a. Yes b. No c. Don't know

9. What disciplines in your HH interprofessional team have the ability to document their engagement with patients in advance care planning conversations in the health record? (select all that apply)
    a. Nurses
    b. Nursing Assistants
    c. Physical Therapists
    d. Occupational Therapists
    e. Speech Therapists
    f. Dieticians
    g. Social Workers
    h. Other (please specify)_____

10. Currently, to what proportion of patients in your agency is advance care planning offered?
    a. All patients
    b. Some patients – but with no particular rationale
    c. Some patients – only users who meet specific criteria (please specify)_____
    d. Not applicable –not offered to patients
    e. Don't know

11. Is your agency's ACP training, protocol, or practice modeled after an existing framework or approach?
    a. Yes, modeled after an evidence-based approach such as Respecting Choices or Five Wishes
    b. Yes, modeled after information found in the literature
    c. Yes, modeled after expert guidance
    d. No

12. Is there anything else you would like to add?

Appendix F: Characteristics of HHVBP States and Non-HHVBP Comparison States

Population Estimates July 1, 2019[1]

State	HHVBP	% with Disability 2014-2018	% in Labor Force 2014-2018
AZ	Yes	8.6	59.2
NM	No	8.6	59.2
FL	Yes	8.6	58.3
TX	No	7.9	64.2
IA	Yes	7.8	67.4
MO	No	10.4	62.6
MD	Yes	7.5	63.4
DE	No	8.5	58.8
NE	Yes	7.7	69.5
KS	No	9.0	65.7
NC	Yes	9.5	61.3
GA	No	8.7	62.4
TN	Yes	11.1	60.9
AR	No	12.5	57.9
WA	Yes	8.8	63.5
ID	No	9.3	62.1

[1]US Census Bureau (2019, July). https://www.census.gov/quickfacts/fact/table

Appendix G: R Code

```
# ACP
library(psych)
describe(d)
d <- read.csv ("c:/r/acpdata.txt", sep="\t", header=TRUE)

#CREATE SCORES
zACP <- rowSums( d[, c(9:15,17)])

TPCP Score #
zTPCP <-d[, "AFIB"
> zTPCP <- d[ , "AFIB"]+ d[ , "ASTHMA"]+ d[ ,"CHF"]+ d[ ,"COPD"]
> zTPCP

WACSUR Score #
zWACSUR <- 1*d[,"ED"]+2*d[,"REHOSP"]+4*d[,"HOSP"]

#TO PUT IDAHO (RKMT) into FW
d[56, "REGION"] <- "FW"

#RACE variable
race <- d [,"BLACK"]/d[,"TOTBENE"]

d[ , "RACE" ] <-race
d[ , "zACP" ] <-zACP
d[ , "zWACSUR"] <-zWACSUR
d[ , "zTPCP" ] <- zTPCP

ead(d)
colnames(d)
?describe
describe(d)
d[ , "STATE"]
unique(d[ ,"STATE"])
summary(d[ ,"STATE"])
summary(mtcars)
summary(d)
summary(d[ ,"STATE"])
summary(d[ ,"STATE'])
summary(d[ ,"STATE'])
table(d[ ,"STATE"])
head(d)
table(d[ ,"STATUS"])
table(d[ ,"ROLE"])
table(d[ ,"HHVBP"])
```

```
table(d[ ,"GATHER"])
table(d[ ,"PROTOCOL"])
head(d)
table(d[ ,"TRAINED"])
table(d[ ,"FUND"])
table(d[ ,"DOCACP"])
table(d[ ,"X.DISCDOC"])
table(d[ ,"OFFERED"])
table(d[ ,"FRMWRK"])
table(d[ ,"HOSP"])
table(d[ ,"REHOSP"])
table(d[ ,"ED"])

#For analyzing string (nominal) variables
t<-table((d[, "STATE"]))       #count
t
100*t/sum(t)                   #percentages

# make scores
colnames( d[, c(8:14,16)])

colnames( d[, c(8:14,16)])

 rowSums( d[, c(8:14,16)])
  zACP <- rowSums( d[, c(8:14,16)])
   zACP
mean(zACP)
sd(zACP)
length(zACP)

cor.test(zACP, d[, "HOSP"]), method = "spearman"
cor.test(zACP, d[, "REHOSP"]), method = "spearman"
cor.test(zACP, d[, "ED"]), method = "spearman"


zTPCP <-d[, "AFIB"]+ d[, "ASTHMA"]+ d[,"CHF"]+ d[,"COPD"]
zTPCP <-d[, "AFIB"

WACSUR Score #
zWACSUR <- 1*d[,"REHOSP"]+2*d[,"ED"]+4*d[,"HOSP"]

CORRELATION #
 zACP <- rowSums( d[, c(9:15,17)])
> zACP
cor.test(zACP, d[, "HOSP"])
```

TPCP Score #
zTPCP <-d[, "AFIB"
> zTPCP <- d[, "AFIB"]+ d[, "ASTHMA"]+ d[,"CHF"]+ d[,"COPD"]
> zTPCP

describe(zACP)
describe(zWACSUR)
describe(zTPCP)

HISTOGRAM
hist(zACP)
> hist(zACP, xlab="Advance Care Planning Protocol Score", ylab="Number of Agencies",main="Distribution")

hist(zWACSUR, xlab="Weighted Acute Care Services Use Rate", ylab="Number of Agencies",main="Distribution")

hist(zTPCP, xlab="Total Percentage of Cardiac and Pulmonary Diagnoses", ylab="Number of Agencies",main="Distribution")

H4 #
kruskal.test(zACP ~ HHVBP, data = d)

VITA

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