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Predictive Factors of Determinants of Health and Services Provided at Adult Day Service Centers

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Walden University
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Abstract

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MS, Hofstra University, 2007

BS, York College, 2002

Submitted in Fulfillment

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Abstract

The National Association of Adult Day Service Centers has suggested that adult day service centers can provide services to meet the complex needs of the older adult and delay nursing home placement. Researchers have yet been able to establish the predictive nature of determinants of health in Adult Day Care Centers (ADSCs). The purpose of this correlational study was to examine the relationship between the determinants of health and the presence of therapeutic services and nursing services at ADSCs. The open system theory guided this study. Data sets from the Centers for Disease Control and Prevention, 2016 Adult Day Services Center Questionnaire were used. The research questions examined how well variables related to determinants of health predicts the likelihood that therapeutic services and nursing services are provided at ADSCs. The results from this binomial logistic regression analysis indicated that certain determinants of health (type of model, number of clients served, and the funding type) play a significant role in whether an ADSCs will provide therapeutic or nursing services from a systems theory perspective. These findings may have implications for social change in the areas of increased awareness about services and programs available at ADSCs in consumers, caregivers, case managers, and policymakers. The dissemination of the study may also guide provision of therapeutic and nursing services in ADSCs to better meet the complex needs of the older adult population.

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Dedication

I want to dedicate this dissertation to my children, Alyssa and Andrew Aldridge.

The completion of this degree is not because I want to be called “Dr. Aldridge.” Instead, it is so that I can be a role model for you. To show you, instead of just telling you that it is possible to achieve the highest degree in existence. Whatever your dreams are, follow them and never give up. I am not saying that the road will be easy. It will be the opposite of easy. It will be long, rough, rocky, and will sometimes seem like it will never end. However, if you persevere, and trust in God, you will succeed! Never forget our family motto:

We don’t meet the standards; we exceed them!

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Chapter 1: Introduction to the Study

The life expectancy of the U.S. population has increased from 72.6 in 1975 to 78.8 in 2015 (Centers for Disease Control and Prevention [CDC], 2017). This increase can be attributed in part to advances in medicine, technology, and lifestyle choices (World Health Organization [WHO], 2016). According to Zulman et al. (2014), as people get older, they are frequently diagnosed with comorbidities of a chronic nature, become increasingly dependent on others, and experience a decline in their activities of daily living. These individuals want to remain in their homes and community if possible (Behrndt et al., 2017; Dabelko-Schoeny, Anderson, & Park, 2016; King et al., 2017). Adult day services centers (ADSCs) were created to accommodate the growing number of retired persons and their desire to age in place (Dabelko-Schoeny et al., 2016; Gendron, Pryor, and Welleford, 2016). ADSCs are also known as adult day health care, adult daycare, community-based daycare, adult day services centers, and day centers, but is referred to generically as ADSCs throughout this paper.

The research questions in this study addressed how well the variables related to determinants of health predict the likelihood that therapeutic services and nursing services will be provided at ADSCs. Determinants of health are personal, social, economic, and environmental factors that influence health status (Office of Disease Prevention and Health Promotion [ODPHP], 2018). The positive social change implications from this study are in the areas of increased awareness of clients, caregivers, case managers, and policymakers about services and programs available in ADSCs. The dissemination of the study may guide program development and foster improved

intervention programs in ADSCs to better meet the complex needs of the older adult population.

This chapter contains the problem statement, the purpose of the study, and the significance of the study. Research questions, hypotheses, and the research design are addressed. I also included a brief description of the theoretical foundation, assumptions, limitations, scope (delimitations), and definitions of terms used in the study.

Background

ADSCs are community-based, long-term care providers designed to meet the needs of the aging population in the least restrictive environment possible (Dabelko-Schoeny et al., 2016). Adult day service centers focus on providing long-term care services to individuals with cognitive and physical limitations (Dabelko-Schoeny et al., 2016). According to Dabelko-Schoeny et al. (2016), ADSCs typically operate on a Monday-through-Friday schedule with hours ranging between 6:30-8:30 a.m. to 4:00-6:00 p.m. About 15% have Saturday hours, 4% are open all weekend, and a small number operate on a 24-hour schedule (Dabelko-Schoeny et al., 2016). The goals of the ADSCs are delaying institutionalization; improving or maintaining clients' mental, physical, and social health; and providing respite for caregivers (Anderson, Dabelko-Schoeny, & Johnson, 2013; Fields, Anderson, & Dabelko-Schoeny, 2014; Hurley et al., 2014; Wittich, Murphy, & Mulrooney, 2014).

Although there are ADSCs throughout the United States, Europe, Asia, Canada, and Australia, researchers know very little about their effectiveness (Brown, Friedemann, & Mauro, 2014; Cuevas, 2015; Eklund & Leufstadius, 2016). According to Anderson et

al. (2013), as of 2013, there were no centralized data reporting requirements for ADSCs. However, each state has its own certification and licensure requirements for the operation of ADSCs. Licensure and certification requirements are also dependent on whether the ADSC follows a social or medical model (Administration on Aging, 2017; Anderson et al., 2013). There is also no federal regulation as to how ADSCs should operate (Anderson et al., 2013). The lack of reporting precludes a thorough exploration of ADSCs and the programs or interventions they provide (Anderson et al., 2013).

In 2014, ADSCs expanded to over 5,600 establishments throughout the United States (National Adult Day Services Association [NADSA], 2018). According to Lendon and Rome (2018), there has been an increase in ADSCs from 40% in 2012 to 45% in 2016. The expansion of ADSCs was in response to the population growth (CDC, 2018a; Fields et al., 2014; Gendron et al., 2016; NADSA, 2018). According to Kelly, Puurveen, and Gill (2016), a Kaplan Meier survival analysis showed an association between ADSCs and delays to institutionalization.

Compared to 2015, by the year 2050, the number of adults who are 60 years of age and older living in the United States will double to about 27 million (Figueira et al., 2016; WHO, 2016). The outcome of this growth is that more people will be living with multiple chronic conditions and there will be an increased cost of long-term care (Figueira et al., 2016). Eklund and Leufstadius (2016) posited the need for further research regarding the effectiveness of ADSCs as it pertains to rehabilitation potential. Over 40% of ADSC clients have physical or cognitive impairments and chronic diseases are prevalent (NADSA, 2018). According to Fried et al. (2014), in 2008, 81.5% of adults

ages 85 and older had two or more chronic diseases. Diabetes accounted for approximately 31% of the ADSC population, and hypertension and cardiovascular diseases accounted for 46% and 34%, respectively (Fields et al., 2014; NADSA, 2018). According to Rome, Lendon, and Harris-Kojetin (2015), cardiovascular disease (44%) and diabetes (30%) are the most common diagnoses among ADSC clients.

Anderson et al. (2013) indicated that there has been an increase in the number of licensed practical nurses and registered nurses in ADSCs since 2002. The increase in nursing staff suggests that ADSCs are delivering services to individuals with more complex medical diagnoses (Anderson et al., 2013). According to Anderson et al. (2013), approximately 69% of ADSC clients are over the age of 65; however, only 50% of ADSCs provide rehabilitation services such as occupational and physical therapy (Anderson et al., 2013). As the older adult population increases, there is a need not only to reduce costs in the health care system but to prevent further decline as they age in place (Dabelko-Schoeny et al., 2016; Gaugler, 2016).

This proposed study is needed because it may provide consumers and case managers the information necessary to select an ADSC with the appropriate programs to meet the needs of the prospective clients. According to Brown, Friedemann, and Mauro (2014), consumers need information about the services offered at ADSCs to participate in decisions about using community-based services actively. Brown et al. found that low utilization of ADSCs could be attributed not only to access issues but also to the lack of awareness of the services available. There is a need to focus on approaches that help ADSC clients maintain their functional independence (Liou & Jarrott, 2013; Teitelman,

Hartman, Moossa, Uhl, & Vizzier, 2017). The results from this study may help in proper planning, programming, and informing best practices of ADSCs to better meet the needs of the growing older adult population.

Problem Statement

According to the NADSA (2018), ADSCs can provide short-term rehabilitation services following hospitalization. Additionally, Anderson et al. (2013) and Dabelko-Schoeny et al. (2016) posited that ADSCs could provide comprehensive health care and chronic disease management for ADSC clients. However, according to Behrndt et al. (2017), scientific evidence of interventions in ADSCs is lacking. According to Anderson et al. (2013), ADSCs are a preferred platform for chronic disease management and comprehensive skilled health care. However, research has shown that the type of services provided by ADSCs varies and it is unclear how prepared ADSCs are to handle the changing demographics of their clients (Anderson, Dabelko-Schoeny, & Tarrant, 2012). The NADSA (2018) reported that 50% of ADSCs provide occupational, physical, or speech therapy services, and about 80% have a nursing professional on staff.

The problem is that researchers have not examined to what degree determinants of health variables predict the likelihood that ADSCs offer therapeutic services or nursing services. Consumers are led to believe that they will receive the same type of services at all ADSCs (Brown et al., 2014; Marak, 2018; NADSA, 2018; State of California, 2015). According to Dabelko-Schoeny, Anderson, and Guada (2013), ADSC research has focused primarily on the effects of attendance at ADSCs rather than programming. According to Gaugler (2014a), previous research was conducted on how the client or

caregiver uses services provided by ADSCs from a qualitative standpoint rather than at the organization level of analysis on service provision.

Research regarding functional outcomes of clients who attended ADSCs is limited or unpublished (Behrndt et al., 2017; Liou & Jarrott, 2013; O'Keeffe, O'Keeffe, & Shrestha, 2014a; Teitelman et al., 2017). Consequently, there is a need for more research on functional outcomes and outcome measures for programs provided at ADSCs (Gaugler, 2014b; Teitelman et al., 2017). According to Anderson (2013), more research is needed to understand the relationship between services provided by ADSCs and outcomes. Eklund and Leufstadius (2016) supported the need for further research regarding the effectiveness of ADSCs as it pertains to rehabilitation potential. Behrndt et al. (2017) posited that scientific evidence is lacking in ADSCs, and the effectiveness of the services offered is unknown. There is a gap in the literature regarding evidence of the predictive nature of socioeconomic and environmental determinants of health in ADSCs using a quantitative approach (Gaugler, 2014b). According to Dabelko-Shoeny et al. (2016), to remain a viable long-term care option, ADSCs depend on the effectiveness of the services provided. Furthermore, Gaugler (2014b) recommended further research on how "size, staffing, service content, and other program-level dimensions influence key outcomes over time among users" (p. 2). To determine outcome measures for service provision, I examine how ADSCs determine what services to provide.

Purpose of Study

The purpose of this quantitative study is to determine whether there is a predictive relationship between the socioeconomic and environmental determinants of health and

the availability of therapeutic services and nursing services provided at ADSCs. The independent variables are socioeconomic and environmental determinants of health (staff profile, number of clients, ownership type, licensure/certification, funding type, and model type). The dependent variables are the availability of therapeutic services (physical, occupational, or speech therapy) and nursing services (RN, LPN).

Research Questions and Hypotheses

Research Question 1 (RQ1): Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services?

$H_0$1: Socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering therapeutic services.

H_a1: Socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering therapeutic services.

Research Question 2 (RQ2): Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services?

$H_0$2: Socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering nursing services

H_a2: Socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering nursing services.

Theoretical Foundation

For this study, I used open system theory. Open system theory is derived from general systems theory that seeks to describe and explain how organizations work (Von Bertalanffy, 1962). Von Bertalanffy (1962) developed open system theory in the 1960s

with a focus on the dynamic interaction of the environment within and surrounding the system or organization (Mele, Pels, & Polese, 2010). The premise of open system theory is that the success of an organization is dependent on environmental influences (Bastedo, 2006). The environment plays a vital role in influencing an organization's decision on what services to offer and not offer. The environment may be physical, social, or financial. Systems theory is appropriate for this study as it is a theoretical perspective that examines systems or organizations as a whole rather than separate parts (Mele et al., 2010) and allows for the consideration of numerous factors (Garavan, 2007).

According to Bastedo (2006), prior to World War II and the development of open system theory, theories of organizations were based on the perspectives of Mayo (human relations perspectives) and Fayol (administrative theories), both of whom saw organizations as self-contained entities and focused on the individual parts rather than the whole. In systems theory, everything is interconnected and interdependent with a focus on the whole versus the individual components (Bastedo, 2006; Von Bertalanffy, 1962). In open system theory, there is a process of exchange of people, capital, energy, material, and information with the environment (Bastedo, 2006; Mele et al., 2010).

The application of open system theory to organizational processes was spearheaded by Katz and Kahn (Mele et al., 2010). According to Mele et al. (2010), some major assumptions of open system theory are that organizations are open to their environment and embrace holism, interdependence, equifinality, and feedback to maintain homeostasis. Energy input, throughput, and output factors that interact dynamically make up organizational systems (Katz & Kahn, 1966; Mele et al., 2010).

Authors such as Mohrman and Shani (2011) and Porter and Derry (2012) found open systems theory to be an effective theoretical framework in addressing an organization's sustainability.

According to Buller and McEvoy (2016), open systems theory is appropriate in addressing systems that are dynamic, complex, and interconnected. As applied to this study, as a system, ADSCs use various resources such as staff profile and the number of clients as inputs. Policies, procedures, and protocols are the processes in the organizational systems that are transformed via throughputs. These throughputs would classify as ownership type, licensure/certification, funding type, and model type. The output of the system are therapeutic and nursing services. These services are the outcome or services provided to the clients that are exported out of the system. In open system theory, there is a feedback loop that allows for continuous adjustments in inputs, throughputs, or outputs into the system (Buller & McEvoy, 2016). The social, physical, and financial environment influences a business' decision on what services to offer and not offer. Chapter 2 provides a more detailed explanation.

Nature of the Study

According to Smith and Noble (2014), a clear articulation of the rationale for and selection of the appropriate research design to answer the research question(s) can reduce common pitfalls in research. I used a nonexperimental research method with a correlational design, including logistic regression for analysis. A quantitative method is appropriate for this study because the primary purpose of this study is to determine whether there is a predictive relationship between socioeconomic and environmental

determinants of health and the availability of therapeutic services and nursing services provided at ADSCs. A quantitative research design allowed me to examine relationships between the independent and dependent variables and to generalize the findings (see Little, 2012). Correlational studies are exploratory in nature compared to experimental or quasi-experimental studies and focus on relationships rather than causation (Portney & Watkins, 2015). A correlational study is effective in predicting relationships between variables as well as the strength of the relationship (Little, 2012; Portney &Watkins, 2015). The quantitative nonexperimental research method was chosen because I used archival data and with no manipulation of the variables.

Table 1 provides information regarding the variables, the levels of measurements for each variable, and how the variables will be coded and analyzed. The independent variables are socioeconomic and environmental determinants of health (ownership type, licensure/certification type, staff profile, number of clients, funding type, and model type). The independent variables were measured on either a nominal or ordinal scale using binomial logistic regression.

Table 1

Variables, Levels of Measurements, Coding, and Analysis

Variable	Measurement	Coding	Analysis (Binomial Logistic Regression)
Independent variables: Ownership type (Socioeconomic)	Nominal	1. Private not for profit 2. Private for profit 3. Publicly traded/LLC 4. Government	The Wald tests Sensitivity/Specificity
Independent variables: Licensure/Certification type (Socioeconomic)	Nominal	0. Yes 1. No	The Wald tests Sensitivity/Specificity

Independent variables. Staff Profile (Socioeconomic)	Nominal	0. FT Employee 1. PT Employee 2. FT Contract or Agency	The Wald tests Sensitivity/Specificity

(*table continues*)

Variable	Measurement	Coding	Analysis (Binomial Logistic Regression)
		3. PT Contract or Agency	
Independent variables: Number of Clients (Environmental)	Ordinal	1. 0-10 2. 11-20 3. 21-30 4. 31-40 5. 41-50 6. 51-100 7. 101+	The Wald tests Sensitivity/Specificity
Independent variables: Funding Type (Socioeconomic)	Nominal	1. Medicaid 2. Medicare 3. Older Americans Act 4. Veterans Administration 5. Other federal, state, or local government 6. Out-of-pocket payment by the client or family 7. Private insurance 8. Other sources	The Wald tests Sensitivity/Specificity
Independent variables: Model type (Social/Medical) (Environmental)	Nominal	1. ONLY social/recreational needs—NO health/medical needs 2. PRIMARILY social/recreational needs and SOME health/medical needs 3. EQUALLY social/recreational and health/medical needs 4. PRIMARILY health/medical needs and SOME social/recreational needs 5. ONLY health/medical needs—NO social/recreational needs	The Wald tests Sensitivity/Specificity
Dependent variables: Therapeutic services (physical, occupational, or speech therapy)	Nominal	0. Yes 1. No	Hosmer and Lemeshow goodness of fit test and Nagelkerke R Square Sensitivity/Specificity
Dependent variables: Nursing services (RN, LPN)	Nominal	0. Yes 1. No	Hosmer and Lemeshow goodness of fit test and Nagelkerke R Square Sensitivity/Specificity

According to Hilbe (2017), binomial logistic regression is appropriate when the dependent variable is dichotomous and the independent variables are continuous or categorical. Regression analysis is used to examine the association between variables and is an effective method in determining the specific function relating the dependent variables to the independent variables (Babbie, 2013). The independent variable is the same for hypotheses H_1 and H_2. The dependent variables are therapeutic services (physical, occupational, or speech) and nursing services (RN, LPN). The measurements are nominal or ordinal and analyzed using binomial logistic regression. This study included secondary data extracted from the 2016 Adult Day Services Center Questionnaire collected by the CDC. Using the data obtained from this survey, I used a binomial logistic regression analysis to examine the predictive relationships among the variables and test the hypotheses.

According to Pedhazur and Schmelkin (2013), in regression analysis, it is vital to have the descriptive statistics, regression equation, and a summary of tests of significance. It is also important to report any correlations among the independent variables when there is more than one independent variable (Pedhazur & Schmelkin, 2013). The strengths of the correlations can be checked using SPSS starting with scatter plots of each independent variable against the dependent variable as well as a stepwise method to assess if there is an underlying relationship (Laerd Statistics, 2016). According to Portney and Watkins (2015), scatter plots or scatter diagrams can produce a visual clarification of the strength and relationship direction of the variables. To obtain a quantitative measure of the relationship between variables, an intercorrelations matrix

may also be used to determine if any independent variables are too highly correlated with other independent variables being considered in the analysis (Portney and Watkins, 2015).

According to Laerd Statistics (2015), there are a few appropriate nonparametric tests to use when performing a binomial logistic regression analysis; all can all be done using SPSS. First, the Hosmer and Lemeshow goodness of fit test is used to assess the adequacy of the model in predicting the categorical outcome. According to Field (2013), the goodness-of-fit statistics indicated the overall fit of the model to reduce errors. Second, the Nagelkerke *R* Square values can be to understand how much variation in the dependent variable accounted by the independent variable can be explained by the model (Field, 2013). Third, the Omnibus Tests of Model Coefficients provide the overall statistical significance of the model, and the Wald test can be used to determine the statistical significance for each of the independent variables.

The output for logistic regression should include regression coefficients for each variable, significance levels for each regression coefficient, odds ratio, and confidence intervals for the odds ratio (Portney & Watkins, 2015). Sensitivity and specificity are important in logistic regression. Sensitivity is the percentage of cases that had the characteristics that were correctly predicted by the model whereas, specificity is the percentage of cases that did not have the observed characteristic and were also correctly predicted as not having the observed characteristic. Finally, the statistics that I reported include the significance level, the odds ratio, the classification accuracy of the regression

model, *F*-tests, confidence intervals, and the reduction in errors pertaining to the regression model.

The CDC was contacted for access and permission to use this data. They provided me with the ADSCs data dictionary and directed me to the Research Data Center (RDC) for information about submitting a proposal to access the data. The data provided by the CDC and NCHS was in Statistical Analysis System (SAS) format. The data was then converted into the Statistical Package for the Social Science (SPSS). The IBM SPSS Statistics 19 data analysis software helped with the management and analysis of the data.

Definitions of Terms

Adult day services center (ADSC): A community-based center that provides long-term care health or social services for individuals living with disabilities or needs assistance with activities of daily living (Dwyer, Harris-Kojetin, & Valverde (2014b); Lendon & Rome, 2018).

Determinants of health: Personal (individual characteristics and behaviors), social, economic, and environmental factors that influence health status (Office of Disease Prevention and Health Promotion [ODPHP], 2018); may include policymaking, income, and social factors, physical environments, social support networks, health services, individual behaviors, biology, and genetics (CDC, 2014; ODPHP, 2018; WHO, 2018).

Licensure/certification type: Center that is licensed and/or certified, and/or authorized to participate in Medicaid by the state it is operating in to provide services as an adult day services center (CDC, 2018c; CMS, 2014b).

Model type: Social/recreational or health/medical model of services designed to meet clients' needs (CDC, 2018c; NADSA, 2018).

Number of clients: Size of facilities are determined by the number of clients served. Small facilities = 1-63 clients, Medium = 64-128 clients, Large = 129+ clients.

Nursing services: Services that must be performed by an RN or LPN and are medical in nature (CDC, 2018a).

Open system: A complex social entity made up of systems, each of which consists of subsystems (Von Bertalanffy, 1962) that receive inputs from the environment, process and transform them, and send them back to the environment as output (Buller & McEvoy, 2016).

Ownership type: The type of ownership under which the center operates, including private not for profit, private for-profit, publicly traded/LLC, or government (CDC, 2018c).

Therapeutic/rehabilitative services: Services provided by physical, occupational, or speech therapists (CDC, 2018a). "Skilled services needed to maintain a patient's current condition or to prevent or slow further deterioration" (CMS, 2014a, p. 14).

Types of funding: Sources of funding for the center, including Medicaid, Medicare, Older Americans Act, Veterans Administration, Other Federal, state, or local

government, out-of-pocket payment by the client or family, private insurance, or other sources (CDC, 2018c).

Assumptions

According to Morrison, Matuszek, and Self (2010), identifying legitimate research assumptions is crucial in ensuring a successful replication of the study. Disclosing the assumptions related to the study contributes to its credibility and presents an accurate evaluation of its quality (Leedy & Ormrod, 2010). I assumed that the data are a reasonable approximation of the status of the responding ADSCs because the 2016 Adult Day Services Center Questionnaire contained self-reported data. According to Jones (2010), studies that have weak internal or external validity or small sample sizes are not archived. I also assumed that the data being collected were representative of ADSCs across the United States, as evidenced by the 61.8% response rate (2,836 ADSCs out of 5,348 ADSCs) for the questionnaire (CDC, 2018b). The response rate varied by state and ranged from 45.5% to 93.8% (CDC, 2018b) and was calculated using the American Association for Public Opinion Research Rate 4 Calculator (American Association for Public Opinion Research, 2018; CDC, 2018b). Jones (2010) posited that sample size, sample type, or sample representation is noteworthy in archival data.

In addition to the assumptions noted above, the following assumptions must also be met for binomial logistic regression: The dependent variable is binomial (yes/no responses) with one dichotomous dependent variable (Laerd Statistics, 2016). The dependent variables of this study are consistent with this assumption because there are two possible outcomes for the dependent variables: offer therapeutic services (yes/no)

and offer nursing services (yes/no). In regression, you must have one or more continuous or nominal variables (Laerd Statistics, 2016). The independent variables of this study are consistent with this assumption, as they are: staff profile, number of clients, ownership type, licensure/certification, funding type, and model type. In addition, the model must be fitted correctly (a stepwise method to estimate the logistic regression can be used to address this), each error term/observation is independent, independent variables and log odds are linear, and the sample size is large (Hsieh, Bloch, & Larsen, 1998). The large sample size requires 15 cases per independent variable at a minimum (Laerd Statistics, 2016) and was met the large sample size provided by the CDC. The assumption of linearity was met using the log (logit) to determine if the significance of the interaction between the independent variable and the log transformation (Field, 2013). The assumption of multicollinearity, no significant outliers, leverage, or influential points (Laerd Statistics, 2016) was met using SPSS with a casewise list table.

Scope and Delimitations

This study address the relationship between the determinants of health and the availability of therapeutic services and nursing services provided by ADSCs located in the United States. To accomplish this objective, all data for this study came from archival data retained by the CDC. There is limited evidence regarding the predictive nature of determinants of health in ADSCs (Anderson et al., 2013; Dabelko-Schoeny et al., 2016; Gaugler 2014b). This gap in the literature led to the development of this study. According to the CDC (2018a), the populations included in the study were the 2,836 ADSCs that completed the questionnaire. The population excluded in the study were the 2,041

ADSCs that could not be contacted by the CDC, the 182 that were identified as out of business, and the 31 that only completed the eligibility questions and were eliminated CDC, 2018a).

Generalizability of the findings may be limited due to many variations of ADSCs in practice as well as in the literature. For example, ADSCs may follow a social model, a medical/health model, or a specialized model (NADSA, 2018). Also, ADSCs may be referred to in the literature as adult day health care, adult daycare, community-based daycare, adult day services centers, and day center.

Limitations

Identification and mitigation of potential limitations associated with a study are important for future researchers to successfully replicate studies (Morrison et al., 2010). A major limitation of this study in using secondary data is that I had no control over the data collection methods (see Jones, 2010). The limitation of using secondary data was mitigated because the source is the CDC and is considered a noteworthy source. Another potential limitation of this study was that there was no randomization. Since I was using secondary data, it is considered a convenience sample (Etikan, Musa, & Alkassim, 2016); however, the CDC used purposeful sampling in the sampling procedure. The potential limitation of nonrandomization was addressed by using a large sample size through power analysis.

Bias is a limitation most researchers encounter. According to Smith and Noble (2014), bias can occur at any phase of the research process; however, most biases can be prevented by selection of the most appropriate study design, implementation, and

statistical tests to ensure the validity and reliability of the findings and interpretation of data (Smith & Noble, 2014). According to Elmes, Kantowitz, and Roediger (2011), bias could be deliberate or inadvertent. Deliberate bias is rarely found in science. However, the magnitude of inadvertent research bias is unknown (Elmes et al., 2011). Inadvertent bias often occurs when the researcher's preconceptions influence their research questions and methodology (Elmes et al., 2011). Sample bias is another form of bias in which not all members of a population are included in the study (Nestor & Schutt, 2018). Sample bias may lead to overgeneralization of results. This can be avoided by using a large representative sample and through replication of inquiry (Babbie, 2013), as was demonstrated by the 2016 Adult Day Services Center Questionnaire.

An additional limitation of this study is the use of secondary data from the CDC that was dependent on self-reported data from ADSCs through the 2016 Adult Day Services Center Questionnaire. The self-reporting of the ADSCs posed the possibility of biased reporting. According to Field (2013), bias must be looked at within three contexts: bias that affects the parameter estimates, bias that affects standard errors and confidence intervals, and bias that affects test statistics and *p*-values. If the test statistics are biased, so is the conclusion of the study. These biases in the study can be minimized or eliminated by addressing outliers and violations of assumptions. Control of biases was filtered during data analysis, with the selection of the most appropriate study design.

The data received from the ADSCs by the CDC was deemed valid and reliable, as it was not the first time the study was being conducted. The 2016 Adult Day Services Center Questionnaire is the third wave of a questionnaire that started in 2012. The second

wave was in 2014. According to personal communication from the CDC, the measures in the 2016 Adult Day Services Center Questionnaire are derived from measures in previously fielded studies (National Nursing Home Survey, National Home and Hospice Care Survey, and National Survey of Residential Care Facilities) as well as from studies elsewhere in National Center for Health Statistics (T. McNeil, personal communication, March 14, 2017). The CDC has specific guidelines for enhancing the accuracy and reliability of the data (T. McNeil, personal communication, March 14, 2017).

Participation, although encouraged, was not mandatory, and not all ADSCs responded. Also, it is not possible to determine if the persons completing the survey are fully aware of the range and types of services offered by the ADSCs, which could result in over, or under-reporting. In using secondary data, it is difficult to control over operationalization of variables as well as ensuring that the unit of analysis is the same. A detailed discussion of each limitation is addressed in Chapter 3 of this dissertation.

Significance

An important aspect of successful aging and being able to age in place is socialization and community engagement (Dabelko-Schoeny et al., 2016). However, this is often not possible due to the challenges, such as chronic diseases associated with aging. The results of this study may advance the evidence in understanding the relationship between the determinants of health and the services offered by ADSCs. The finding from this study may also address the necessity of stakeholders to understand and consider the feasibility and the need for implementation or adaptation of services to meet the unique needs of their consumers. The results of this study may also add to the body of literature

on ADSCs and contribute to the advancement of knowledge and better awareness of ADSCs for policymakers by laying the foundation for future research. There is potential for positive social change in programming, regulation, and advocacy through the increasing awareness of how the determinants of health influence the provision of services in ADSCs. Ultimately, the positive social change significance of this study is to lay the foundation for future research related to ADSCs and the provision of services to meet the needs of consumers.

Summary

This chapter contained a summary of the study. A description of the study background, statement of the problem, and research questions guided by open system theory was provided. ADSCs advertise that they can meet the needs of individuals with chronic illnesses and may serve as an alternative to skilled nursing facilities. Consumers are led to believe that they will get the same type of services at all ADSCs. Researchers have not examined to what degree variables of determinants of health predict the likelihood that ADSCs offer therapeutic services and or nursing services. With this study, I examined the relationship between determinants of health variables and therapeutic services and nursing services offered in ADSCs. This correlational study used logistic regression to analyze archival data from the CDC to assess the predictability of determinants of health to therapeutic and nursing services in ADSCs. The results of this study are beneficial in bringing additional understanding of ADSCs and its programs to meet the needs of their clients.

Chapter 2 of this dissertation contains a comprehensive review of the theoretical framework that guides this study and a review of the literature on various aspects of this study. I also justify the variables used in this study. Finally, I conclude Chapter 2 with a discussion of how the literature and proposed study relates to positive social change.

Chapter 2: Literature Review

Introduction

The purpose of this chapter is to provide an overview of the search strategy and theoretical framework, as well as provide a review of the literature that establishes the relevance to the problem and the possible social change implications of this study. The problem is that researchers have not examined to what degree determinants of health variables predict the likelihood that ADSCs offer therapeutic services or nursing services and the lack of scientific evidence in ADSCs (Behrndt et al., 2017). According to NADSA (2018), Anderson et al. (2013), and Dabelko-Schoeny et al. (2016), ADSCs can provide comprehensive health care and chronic disease management for clients. While consumers may believe they will receive the same type of services at all ADSCs (Brown et al., 2014; Marak, 2018; NADSA, 2018; State of California, 2015), only 50% provide any rehabilitation or social services and only 80% provide nursing services (NADSA, 2018). However, it is unknown how ADSCs determine what services to provide. This study aims to provide some clarification regarding service provision in ADSCs, which may help consumers select the most appropriate center to meet their needs.

The research on service provision in ADSCs is sparse. Researchers have focused on clients' attendance at ADSCs versus the programs provided (Dabelko-Schoeny et al., 2013; Eklund & Sandlund, 2014; Teitelman et al., 2017), caregivers' stress/burden (Anderson et al., 2013; Zarit, Bangerter, Liu, & Rovine, 2016; Zarit, Kim, Femia, Almeida, & Klein, 2014), and cognitive impairments of the clients (Wittich, Murphy, & Mulrooney, 2014). Anderson et al. (2013) also argued that the evidence as to the

effectiveness of ADSCs in addressing clients' physical functioning outcomes (activities of daily living dependency) is sparse. The purpose of this correlational study is to determine the relationship between determinants of health variables and therapeutic services as well as nursing services of ADSCs in the United States.

Chapter 2 contains a highly focused review of the literature pertaining to this study. After I expound on the theoretical framework used to guide the study, I provide an in-depth review of previous research as it relates to ADSCs, determinants of health, therapeutic services, and nursing services. A review of chronic diseases and specialized programs offered at ADSCs is also included, and I end the chapter with a discussion of the social implications of this study.

Literature Review Search Strategy

The search strategy included searching databases such as MEDLINE, CINAHL Plus, CINAHL Complete, PubMed, Academic Search Premier, as well as PsycINFO, and AgeInfo. Keywords used included *adult daycare*, *community-based daycare*, *adult day services*, *adult day health*, *adult day services centers*, *day center*, *geriatric day hospital*, *staffing*, *credentialing*, *registered nurses*, *licensed practical nurses*, *professional staff*, *clinician*, *staffing levels*, *regulations*, *licensure*, *licensed*, *certification*, *legal*, *law*, *regulatory*, *disease-specific programs*, *interventions older adults*, *chronic diseases*, *business theory*, *organizational theory*, *organization*, *organizational structure*, *systems theory*, *open system theory*, *comorbidity*, *multimorbidity*, *diabetes*, and *cardiovascular diseases*. The use of the Boolean operator "AND" and "OR" was used to combine related concepts. Only articles published in English since January 2012 were initially included.

However, earlier years and textbooks had to be included to provide a more comprehensive view of ADSCs, and the selected theoretical framework as the information in sources from 2012 forward was limited. I also used a cited reference search using the Web of Science to find the articles that cited each relevant article for generating related articles.

An inquiry using the search term *adult day services* produced 3,580,000 in Google scholar. Narrowing the search by using *"adult day services"* significantly decreased the number of articles to 2,800. Walden University Library and Nova Southeastern University Library results were significantly less compared to the Google Scholar results and not necessarily relevant to my topic. A review of the reference lists of articles was conducted to locate additional articles judged to be relevant. Books were used to discuss the relevance of the framework and some statistical concepts.

A review of each article abstract was performed first, when available, before a full-text article was reviewed. For abstracts that included the keywords of this study but were not available online through Google scholar, the articles were obtained through the Walden University Library System or Nova Southeastern University Library System. Only studies that were available in English and peer-reviewed were included as a search criterion. The literature was categorized and cataloged using EndNote X8 for PC (Thompson Reuters, Philadelphia, PA) bibliographic software.

Theoretical Foundation

The open system theory is appropriate for this research as I am looking at the relationship of variables in the organizational system of ADSCs. Open system theory

originated from general systems theory in the 1960s and was founded by biologist Ludwig Von Bertanlanffy; it seeks to describe and explain how organizations work and the processes involved (Katz & Kahn, 1978; Von Bertalanffy, 1962). In open system theory, Von Bertanlanffy focused on the dynamic interaction of the environment within and surrounding the system (Mele, Pels, & Polese, 2010). For the purposes of this study, the system refers to the organization. One of the main theoretical propositions of open system theory is that the whole system is greater than the individual parts (Mele et al., 2010). In open system theory, there is a process of exchange of people, capital, energy, material, and information with the environment (Bastedo, 2006; Mele et al., 2010). According to Mele et al. (2010), understanding how an organization works, how it can be influenced, and how it can cope with chaos is crucial in open system theory (Mele et al., 2010).

According to Bastedo (2006), before open system theory, organizations were viewed as self-contained entities and focused on the individual parts rather than the whole. Organizations as self-contained entities were based on the perspectives of Elton Mayo (human relations perspectives) and Henri Fayol (administrative theories), both of which are reductionist perspectives. These reductionist perspectives saw organizations as a closed system that had stability and did not need to adapt or interact with their environment (Knutsen & Brock, 2014). In systems theory, everything is interconnected and interdependent with a focus on the whole versus just the individual components (Bastedo, 2006; Chikere & Nwoka, 2015; Von Bertalanffy, 1962). Although the push of

viewing the organization as a whole is vital, the reductionist thinking is not completely replaced; a dialogue between the two need to occur (Mele et al., 2010).

The application of open system theory to organizational processes was spearheaded by Katz and Kahn, who viewed organizations as social systems (as cited by Mele et al., 2010; Meyer & O'Brien-Pallas, 2010). The basic principle of open system theory is that the organization is dependent upon the environment for survival (Chikere & Nwoka, 2015; Katz & Kahn, 1966). Yucel (2016) posited that organizations affect their environment and are also affected by the environment. According to Gimžauskienė and Klovienė (2008), to sustain in a competitive market, organizations need to adapt to their environment.

Some basic tenets of open system theory as applied to organizations are that organizations:

> 1. Are living systems that are ever-changing and adapting to their external environment 2. Are dynamic internally, with all subsystems anticipating, responding, or reacting to changes within the organization 3. Organize around their corporate survival strategy, exploiting, and filling niche(s) in the markets 4. Must be internally congruent or consistent to maximize efficiency and effectiveness. (Overholt, Connally, Harrington, & Lopez, 2000, p.39)

Organizations such as ADSCs contains these tenets.

Concerning organizations, system refers to different parts or independent parts working together in an interrelated way to accomplish the organization's vision (Chikere & Nwoka, 2015). According to Katz and Kahn (1966), an organization is made up of

energic input and output systems that reorganize and reactivate based on the feedback regarding the output and its relationship to the environment. Further, Katz and Kahn, as well as Mele et al. (2010), asserted that a major assumption of open system theory are that organizations are open to their environment. In addition, open system theory indicates organizations should embrace holism interdependence, autopoiesis, equifinality/common finality, self-regulation, equilibrium/balance, and feedback to help to maintain homeostasis. Morgan (1986), Levasseur (2004), and Scott (1998) also viewed an organization as an open system that is interactive with the environment and adapts to changes within the environment.

Open system theory has been used in the literature as a theoretical base for organizational sustainability, strategy, and provision of services (Morgan, 1986; Mohrman & Shani, 2011; Porter & Derry, 2012; Scott, 1998). Meyer and O'Brien-Pallas (2010) used open system theory to develop the nursing services delivery theory. In this study, the authors asked the following questions: What is the nature of an organization? How do healthcare organizations produce nursing services? How do management structures contribute to the delivery of nursing services? The authors found that an open system theory approach was the best way to answer the questions and build on nursing services delivery theory. Also, Chikere and Nwoka (2015) found that systems theory was an effective way of examining organizations and should be used for organizational success. Similarly, in a qualitative study, Stenvall, Laitinen, Ursin, Virtanen, and Kaivo-oja (2014) found open system theory to be effective in how services influenced the environment through the creation of local identity.

Open system theory is the best option to answer my questions as it looks at how organizations operate and their dependence on the socioeconomic and environmental determinants of health for sustainability. According to Jablin (1975), an organization is dependent on the environment for its existence and sustainability. Open system theory is effective in determining how organizations determine which services to offer. Open system theory has simplicity, completeness, robustness, adaptability, controllability, and applicability (Levasseur, 2004). Open system theory helped in answering the research questions in determining why an organization may choose to provide a service and the internal and external factors (determinants of health) that may affect it. According to Buller and McEvoy (2016) and Chikere and Nwoka (2015), open system theory is appropriate when looking at various analyses (i.e., the individual, organization, political, economical, and social systems). For this study, the level of analysis is the organization (ADSCs).

Jablin (1975) reported that open system theory is a continuous dynamic interaction of an organization and subsystems with its environment. Buller and McEvoy (2016), claimed that in an organization, the external environment includes forces that shape the need for sustainability. These forces may be the expectations of stakeholders, customers, competitors, communities, and governmental and non-governmental organizations. The interaction of these forces influences the organization's strategic plans and tactics (Buller & McEvoy). As was mentioned previously, in open system theory, organizations receive inputs, i.e., determinants of health from the environment and transform them into output, i.e., therapeutic and nursing services (Katz & Kahn, 1978;

Wright & Snell, 1991). Organizational systems are made up of energic input, throughput, and output factors that interact dynamically (Mele et al., 2010). Characteristics of open system and their application to large-scale organizations and ADSCs are presented in Table 2.

Table 2

Open System Concept and Large-Scale Organization and ADSCs

Concept	Definition (Katz & Kahn 1978)	Application to large-scale organizations (Katz & Kahn 1978)	Application to ADSCs
Inputs	The inflow of energy and information from the external environment renews the system	People, materials, and resources from other organizations. May also include negative feedback.	People-Staff, ADSCs clients, caregivers. Resources-Funding Licensure/Certification
Throughputs	Energies inside the system are transformed by reorganizing the inputs	Processing of materials or provision of services.	Policies, procedures, and protocols
Outputs	Product must be exported to the external environment	Tangible results from the organization, i.e., materials, products, or services provided	Services-rehabilitative and nursing services (Benefits to clients)
Systems as cycle of events	The process of exchanging and transforming energy must renew the system thus creating a repeated series of activities	System output or internal activities	Revenue /payor source. Licensure/certification
Negative Feedback	Internal information about system functioning is a corrective device used to adjust energy intake and expenditure	Feedback from the various subsystems used to keep the organization functional and achieve goals	Performance Indicators. Feedback from clients and caregivers. Hospitalizations/deaths

Note. From "Nursing Services Delivery Theory: An Open System Approach," by Raquel M. Meyer Linda L. O'Brien-Pallas 2010, *Journal of Advanced Nursing*, 66(12), pp. 2828–2838. Reprinted with permission.

Focus of Previous Research

Cho, Kim, and Lee (2013) predicted that 40% of older adults would need some form of long-term care over the next 20 years. In response to this need, ADSCs have increased over the years. ADSCs fall under the umbrella of home and community-based services (HCBS) and may be of a medical or social model or combined model (Dabelko-Schoeny et al., 2016). ADSCs use a person/patient-centered approach that typically involves family and friends (Bulsara, Etherton-Beer, & Saunders, 2016). Many of the services offered at ADSCs focus on clients with cognitive deficits or some form of mental disabilities (Dabelko-Schoeny et al., 2013). The focus of previous research has been on relieving caregiver burden and programming for Alzheimer's and dementia (Cho et al., 2013). The research has shown that increased caregiver burden often led to the institutionalization of the elderly and difficulties for the caregiver (Cho et al., 2013). Liu, Kim, and Zarit (2015) and Gaugler (2014b) also posited that descriptive studies had shown psychosocial benefits for ADSC clients and emotional wellbeing for their caregivers.

According to Cho et al. (2013), the definition of *functional dependence* is the need for assistance in one or more areas of basic activities of daily living or instrumental activities of daily living. Activities of daily living are commonly known as self-care tasks and include grooming, dressing, hygiene, bathing, toileting, transferring, ambulation/ locomotion, and eating. Instrumental activities of daily living include planning and preparing light meals, transportation, laundry, housekeeping, shopping, and the ability to use the telephone (Harris-Kojetin et al., 2016). Individuals who can perform daily living

activities without assistance have a lower risk of falls and comorbidities (Hurley et al., 2014). According to Su, Chen, Dall, Iacobucci, and Perreault (2016), older adults with chronic diseases have a higher likelihood to have a disability within the areas of activities of daily living. Likewise, Anderson et al. (2013), Cho, Kim, and Lee (2013), and Fields et al. (2014) reported that clients in ADSCs with impairments, disabilities, or chronic diseases require a higher level of assistance with daily self-care tasks such as hygiene and grooming, feeding, dressing, toileting, and ambulation than those who did not. When older adults require increased assistance with their ADSCs, the burden on the caregiver increases, which may negatively impact the caregiver as well as the patient (Forster et al., 2013). According to Lendon and Rome (2018), nonprofit ADSCs had a higher percentage of clients who required assistance with their activities of daily living (bathing, toileting, dressing, transferring into and out of a chair, and eating) compared to clients in for-profit centers.

Mobility is often referred to as the ability to move from one surface to another. Caregivers often feel unprepared when the older adult is unable to ambulate or transfer from the bed to chair or chair to toilet on their own (Forster et al., 2013). According to Caffrey et al. (2012), in 2010, 25% of residential care residents received assistance with transfers. In addition to assistance with transfers, according to Caffrey et al. (2012), in 2010, 36% of residential care residents received assistance with toileting. Toileting in the elderly is understudied, poorly defined, and poorly described (Talley, Wyman, Bronas, Olson-Kellogg, McCarthy, & Zhao, 2014). Most researchers included toileting in studies about activities of daily living rather than investigating it independent of the other areas

of activities of daily living (Talley et al., 2014). Environmental factors, as well as bowel and urinary incontinence, contribute to toileting disabilities (Talley et al., 2014). Talley et al. (2014) suggested that preventive and management programs, including physical activity, may improve mobility and toileting skills.

According to King et al. (2017), caregivers consider toileting a difficult activity. The ability to toilet requires the older adult to change body position (transfer) and may result in fear of falling as well as blood pressure changes (King et al., 2017). There are sub-activities other than transfers that fall under the activity of daily living of toileting. According to the CDC (2011), 14.1% of injuries that happened in the bathroom occurred when transferring on or off the toilet or using the toilet. Adults age 85 and older accounted for 51.7% of these injuries (CDC, 2011).

Therapeutic/Rehabilitative Services

The NADSA (2018) reported that given the prevalence of chronic conditions, there is an increase in disease-specific programs in ADSCs. Some of the disease-specific programs offered by ADSCs are diet and weight management programs, physical activities, educational programs, medication management, and referrals for programs not offered at the center (Dabelko-Schoeny et al., 2016). Despite the need for such services, according to the NADSA (2018), approximately 50% of ADSCs provide therapeutic services. Harris-Kojetin et al. (2016) also reported that findings from the 2014 Adult Day Services Center Questionnaire show that only 49% of the ADSCs that participated in the survey provided therapeutic services. Rehabilitative/Therapeutic services are needed in all ADSCs to address the prevalence of chronic diseases and provide disease-specific

programs. While there has been an increase in disease-specific programs within ADSCs (NADSA, 2018), there are no clear statistics on what this increase looks like.

ADSCs need individualized programs. Arbesman and Mosley (2012) found that there is a moderate to strong relationship between community-dwelling adults' occupations and productive aging when it is client-centered and occupation-based. However, the evidence did not address community-dwelling adults who were attending ADSCs. The evidence regarding health education programs and the reduction of pain and increase of physical activity was moderate (Arbesman & Mosley, 2012). There was also moderate evidence that individualized health action plans improve function and participation in physical activities (Arbesman & Mosley, 2012).

Chronic diseases are associated with unhealthy lifestyle behaviors (Ford, Croft, Posner, Goodman, & Giles, 2013). Therefore, if health care providers can reduce these behaviors, there may be a decrease in the prevalence of chronic diseases. For example, Chan (2004) conducted a qualitative study in Hong Kong and found that after four weeks of occupational therapy interventions that included teaching coping skills and breathing skills, clients had an increase in their perception of control of their disease and knowledge of the management of their chronic illness. The purpose of the interventions was on engagement or re-engagement in activities of daily living and carrying out life roles. (Chan, 2004). Chan's results provide support for the idea that changing an individual's behaviors may impact chronic illness.

ADSCs are capable of meeting the needs of individuals with various diagnoses if they provide therapeutic or rehabilitative programs. According to Ishii, Kojima,

Yamaguchi, and Akishita (2014), activities of daily living performance can be maintained and preserved through rehabilitation. In addition, according to Gustafsson et al. (2012), programs that promote health in older adults reduce functional dependence. Adding to this, a clinical trial study conducted by Barnes et al. (2015) showed that exercise improved the physical and cognitive functions of older adults with a mean age of 84 years. The study also indicated a decrease in caregiver burden and improved quality of life (Barnes et al., 2015). In contrast, Harris-Kojetin et al. (2016) reported that in comparison to other long-term care providers; ADSCS do not offer as much mental health services or therapeutic services although they are equipped to serve as a platform for individuals with anxiety and depression (Dabelko-Schoeny et al., 2013).

Multiple studies provide support for rehabilitative services in ADSCs to promote independence, reduce the number of falls, and increase quality of life for clients. Kwok and Tong (2014), for example, studied a group of community-dwelling adults to compare center-based training with home-based training over a 6-month intervention period in Hong Kong. The authors found that the clients who received center-based training by a physiotherapist improved physical function, increased quality of life, and reduced incidences of falling in comparison to those in the home-based training. Henwood, Wooding, and de Souza (2013) reported that to reduce functional decline, ADSCs in Australia are including physical exercise programs into the daily curriculum. These programs can prolong independence and are low cost (Henwood et al., 2013).

According to Kwok and Tong (2014), exercise helps to slow down the progression of disability and illnesses as well as reduce the risk of physiological changes.

Furthermore, exercise is effective in reducing falls as it improves balance and mobility and has been proven to improve mental well-being (Kwok & Tong, 2014). Similarly, Barnes et al. (2015) found that exercise improves the ability of individuals with cognitive impairments to perform their basic self-care tasks. Likewise, a study of 830 ADSCS clients with an average age of 83.7 conducted in Japan by Hayashi et al. (2016) found that ADSCs that employed occupational and physical therapist showed the Occupational Therapy and Physical Therapy interventions prevented an exacerbation of gait function. For my proposed study, physical activity and exercise classify as occupational and or physical therapy.

Individuals with chronic diseases could have better outcomes with occupational therapy interventions. Chan (2004) conducted a qualitative study in Hong Kong and identified four themes that clients experienced with occupational therapy interventions for chronic disease management of COPD: (a) increased knowledge of the disease, (b) taking control and re-engagement in activities, (c) alleviation of mental burden, and (d) social support (Chan 2004). Martinsen et al. (2017) also found that in a randomized study of 53 clients, individuals who received occupational therapy interventions showed small but significant changes in activity performance compared to the control group.

The American Geriatrics Society (2012) argued that single disease management is not effective. Rather, it is a barrier to older adults with multimorbidity and may result in impractical, irrelevant, or harmful care. Oliver and Foster (2013) supported the position of the American Geriatrics Society and posited that programs that address chronic diseases and multiple comorbidities are needed to help reduce the amount of assistance

needed with activities of daily living, relieving caregiver burden, and reducing health care expenditures. In considering the needs and interventions for these individuals, it is important to consider both the physical and psychological factors (Nakamura-Thomas & Kyougoku, 2013). In a study conducted in Hong Kong, the author found that clients did not only experience a physical decline or activity restriction with chronic diseases but also isolation (Chan, 2004). These individuals are often unable to participate in their activities of daily living and are environmentally and socially isolated (Chan, 2004).

Nursing Services

According to the NADSA (2018), nursing services in ADSCs are provided by registered nurses (RN) or licensed practical nurses (LPN), but more information is needed on how ADSCs determine what services to provide. According to Gaugler (2014b), ADSCs clients with complex chronic conditions require the skills of a registered nurse. However, in comparison to direct care workers and activity directors, the number of registered nurses in ADSCs was low (Gaugler, 2014a). In addition, although the NADSA (2018) reports that 80% of ADSCs have nursing services, results from the 2014 Adult Day Services Questionnaire showed that only 66% of ADSCs that participated in the survey provided nursing services (Harris-Kojetin et al. 2016).

In addition to therapeutic services, treatment of chronic conditions requires multiple medications. According to Sanders and Van Oss (2013), more than 50% of adults ages 65 or older are taking at least three to four medications daily. Unfortunately, the medication compliance rate is low (25-50%), and about 125,000 deaths that occur each year can be attributed to these adults not taking their medications correctly (Sanders

& Van Oss, 2013). Studies have not shown that one specific medication adherence strategy is effective for all individuals. Therefore, the focus has been on client-centered strategies (Sanders & Van Oss, 2013). The results from Sanders and Van Oss support the need for ADSCs to provide individualized care to its clients and that medication strategy for someone with diabetes may be different from another individual with congestive heart failure.

Medication management is divided into two categories: medication assistance and medication administration (Carder & O'Keeffe, 2016). Medication assistance refers to individuals who have the cognitive abilities and understanding of how to take medication but need physical assistance from a staff member to take the medication because of a physical impairment or disability (Carder & O'Keeffe, 2016). Those individuals who need medication administration may require not only physical assistance but also assistance with correct dosage and application (Carder & O'Keeffe, 2016). Carder and O'Keefe (2016) also pointed out that, depending on the state, there may be some overlap between medication assistance and medication administration. According to O'Keeffe, O'Keeffe, and Shrestha (2014b), each state makes its own determination as to whether or not medication administration is a skilled or unskilled service. Therefore, exploring the provision of nursing services in ADSCs requires clarification on the client's need for medication assistance or medication administration and the regulation surrounding the provision of these services.

Medication adherence also differs from state to state. In a qualitative study of 149 community-dwelling older adults, Sanders and Van Oss (2013) found that 51% of clients

required assistance with taking medication. However, according to Carder and O'Keeffe (2016), of all the states that provide adult day services, only 39 of these states are required to administer medications. Dwyer, Carder, and Harris-Kojetin (2014a) reported that residential care settings provided 94% of medication management services in-house. However, there was no specific data regarding medication management in ADSCs (Dwyer, Carder, & Harris-Kojetin, 2014a).

Determinants of Health

Ownership type. In the September 2014 NCHS data brief, Dwyer, Harris-Kojetin, and Valverde (2014b) reported that ADSCs fall under two ownership types: nonprofit, which are most ADSCs, and for-profit. For-profit ownership increased by 13% over two years, from 2010 to 2012 (Dwyer et al., 2014b). The 2016 Adult Day Services Questionnaire addressed four ownership types: private non-profit, private for-profit, publicly-traded company or limited liability company, and government (federal, state, county, or local). Dwyer et al. (2014b) found that for-profit ADSCs provided a higher percentage of nursing, mental health, pharmacy, and therapeutic services than non-profit ADSCs. Lendon and Rome (2018) found that for-profit ADSCs served an older population; served more clients with diabetes, heart disease, depression, or severe mental illness; and had more services paid by Medicaid compared with non-profit ADSCs. Conversely, non-profit ADSCs clients required more assistance with activities of daily living and serviced more clients with cognitive disabilities compared to for-profit ADSCs (Lendon & Rome, 2018). In the February 2018 NCHS data brief, Lendon and Rome (2018) reported a statistically significant difference ($p < 0.05$) among clients in for-profit

centers and nonprofit centers as it relates to race/ethnicity, sociodemographic characteristics, need for assistance with activities of daily living, emergency department visits, discharges from overnight stays, and falls. The results of these studies confirm the need to explore the relationship between ownership type and the provision of rehabilitative or nursing services in ADSCs.

Licensure/certification type. As the population ages, the need for ADSCs will increase, as will the need for standardized regulation among these centers. A scarcity of information exists regarding the services provided, utilization, and outcomes of ADSCs (O'Keeffe et al., 2014a). Dabelko-Schoeny et al. (2016) theorized that the scarcity of information is a direct result of no federal oversight and the variation in services provided by the centers. Each state has its own rules and regulations regarding licensure and certification of ADSCs (Dabelko-Schoeny et al., 2016; O'Keeffe et al., 2014b). The NADSA (2018) concurred that ADSCs are not federally regulated. Furthermore, O'Keeffe et al. (2014b), reported that of the 50 states, 26 states require ADSCs licensure only, and 10 states require ADSCs certification only. Also, four states require both licensure and certification, while 13 states operate under contractual requirements (O'Keeffe et al., 2014b). Additionally, there are 11 states that do not require licensure or certification (private pay clients) and are not regulated (O'Keeffe et al., 2014b). ADSCs that are Medicaid funded must meet additional Medicaid requirements (O'Keeffe et al., 2014b). The lack of federal regulation of licensure and certification requirements of ADSCs may impact service provision to clients.

Similar to other treatment interventions, there is no national data available on medication use and management by ADSCs clients (Carder & O'Keeffe, 2016). Furthermore, Carder and O'Keeffe (2016) were not able to find any literature on the regulation of medication administration in ADSCs. Revisiting regulation of ADSCs is recommended as it relates to the assistance and administration of medication. As the need to age in place increases (Behrndt et al., 2017), so will the demand for ADSCs. Consequently, the demand for increased ADSCs will also mean greater reimbursement to ADSCs (Dabelko-Schoeny et al., 2016). As such, regulations must be in place locally and nationally. Legislative initiatives and funding will be needed to shape policies that will help to care for this growing population (Dabelko-Schoeny et al., 2016).

Model type. ADSCs are operated under three different models of care: social, medical/health, and specialized (NADSA, 2018; O'Keeffe et al., 2014a). According to the NADSA (2018), the social model is more recreational based with a focus on social engagement, and minimal health-related services are provided. The medical/health model focuses more on intensive health and therapeutic services while providing some social activities (NADSA, 2018; O'Keeffe et al., 2014b). The specialized model provides services specific to individuals with dementia or developmental disabilities (NADS, 2018; O'Keeffe et al., 2014b. According to Brown et al. (2014), there are also combined models that offer both social and medical services. Unfortunately, the services offered by these centers are often ambiguous and difficult to distinguish (Brown et al., 2014).

Funding type. Funding of ADSCs has expanded over the years to include health care costs. According to Anderson et at. (2012), funding for ADSCs began in the 1970s

with amendments to the Social Security Act and expanded in the 1980s with the Older Americans Act and Medicaid Home and Community-based Waiver Programs. Anderson et al. (2012) posited that public funding continued to grow in the 1990s and 2000s, with about 85% of ADSCs receiving public funding for care. Lendon and Rome (2018) reported only 58% of ADSC clients in nonprofit centers paid for services with Medicaid, compared to 73% in for-profit centers. The types of funding addressed in the 2016 Adult Day Services Questionnaire were Medicaid, Medicare, Older Americans Act, Veterans Administration, Other (federal, state, or local government), Out-of-Pocket, Private insurance, and other source. Also, O'Keeffe, O'Keeffe, and Shrestha (2014b) reported all states used Medicaid to fund ADSCs except for West Virginia and the District of Columbia.

The United States population is not only growing but also living longer. According to the NCHS (2015), the life expectancy at birth in the United States in 2014 was 78.8 years for the total population compared to 77.8 in 2006. Nursing care facilities and continuing care retirement communities accounted for 6.1% of health care expenditures in 2014, while hospital care accounted for 37.9% of noninstitutionalized individuals (NCHS, 2015). Reimbursement rates are not comparable among states as the rates vary according to the services being provided by the ADSCs (O'Keeffe, O'Keeffe, & Shrestha, 2014b). According to Anderson et al. (2012), funding was the number one concern for ADSCs regarding current and future challenges or barriers, and funding is of great concern with the constant cuts to programs for the elderly. According to Felix, Mays, Stewarts, Cottoms, and Olson (2011), allowing the growing population to age in

place while providing community-based services such as ADSCs can be, and has proven to be, cost-effective. Genworth Financial (2017) reported the average cost for nursing home care is $7,148 per month for a semi-private room or $8,121 per month for a private room, whereas the cost for ADSCs was $1,517 per month in 2017. In 30 years, the projected cost for nursing home care will be $17,350 per month for a semi-private room or $19,712 per month for a private room. The projected cost for an ADSC is $3,682 per month (Genworth Financial, 2017). Although the research shows that ADSCs cost almost four times less than skilled nursing facilities at just $61.71 per day (Gaugler, 2014b), Medicare currently does not pay for ADSCs. Rather, the Veteran's Administration (VA) and Medicaid Home and Community-Based Waiver Programs fund ADSCs (Fields et al., 2014), but this funding will likely not be enough as the prices increases. In addition, Medicaid reimbursement varies from state to state and is often below home care rates resulting in a decreased incentive for ADSCs to accept those complex clients who need the services (Anderson et al., 2012).

Total number of clients. According to Brown et al. (2014), age, gender, race, and ethnic group are crucial in predicting the use of health services and may contribute to the use of ADSCs services. Dwyer**,** Harris-Kojetin, and Valverde (2014b) reported that non-profit ADSCs average daily attendance was 33 clients, whereas for-profit centers accounted for 48 clients. The greater the frequency of attendance at ADSCs, the greater the quality of life (Iecovich & Biderman, 2013). According to Dabelko-Schoeny et al. (2016), 50% of ADSC clients attend five days per week, and researchers have found that caregivers experienced decreased caregiver burden, worry, depression, anger and

perceived role overload when the use the services of ADSCs for at least 8 hours per week.

Staff profiles. The staffing profiles for each ADSC varies depending on the state's requirements. Each state operates on their own licensure or certification requirements (Marak, 2018; O'Keeffe et al., 2014a; O'Keeffe et al., 2014b). All states except for six have a minimum direct staff-to-client ratio (O'Keeffe et al., 2014b). Those ADSCs that are Medicaid providers have a one to six ratio of staff to clients and a ratio of one to four for those centers that serve clients with severe impairments (O'Keeffe, O'Keeffe, & Shrestha, 2014b). According to Marak (2018) and O'Keeffe et al. (2014b), ADSC staff may comprise of an Administrator or Director, Nursing Assistants or Personal Caregivers, Activities Professionals, Registered and License Nurses, Social Workers, Dietary Consultants, and volunteers depending on the services being provided. Staff may be part-time, full time, or contract (O'Keeffe et al., 2014b). In Canada, a geriatric day hospital team consists of a physician, nurse, occupational therapist, social worker, physiotherapist, psychologist, and dietician (Moorhouse et al., 2017).

Positive Social Change Implications

The social change implications of this study are increased awareness and understanding of ADSCs and the services provided based on the organization demographics for the older adult, caregivers, and policymakers. In addition, this study may add to the body of literature as it pertains to ADSCs and its programs. In the United States, there is a lack of evidence regarding the effectiveness of programs in ADSCs. However, with chronic diseases and multiple comorbidities in ADSC clients, it is critical

to provide programs to help with each client's well-being, function, and health care costs. According to Cho et al. (2013), older adults want to stay in their homes rather than go to an institution; community-based services such as ADSCs can reduce the expense of institutional care. Therapeutic and nursing services can facilitate clients' re-engagement in activities of daily living and resumption of life roles to the extent of their abilities (Chan, 2004) and allow them to age in place.

Summary and Conclusions

Consumers currently find it difficult to determine what services ADSCs provides (O'Keeffe, O'Keeffe, & Shrestha, 2014a). Because over 50% of older adults have difficulty with or are receiving help with activities of daily living (Kasper & Freedman, 2014), there is a need for services that are focused on the client and can help the client remain as independent as possible. All studies reviewed in this research showed a decrease in overload, depression, anger, and caregiver burden (Dabelko-Schoeny et al., 2016; Shahbazi, Foroughan, Rahgozar, & Roghani, 2016; Zarit et al., 2014) when the clients attend ADSCs compared to skilled nursing facilities. There have been varying results regarding the effects of ADSCs on delaying nursing home placements and the benefits of ADSCs (Dabelko-Schoeny et al., 2016; Shahbazi et al., 2016). One thing that all the studies had in common was the recommendation for continued research on the benefits of ADSCs and the effects of ADSCs on function (Dabelko-Schoeny et al., 2016; Shahbazi et al., 2016). This study filled the gap in the literature on the likelihood that determinants of health variables will predict the services provided by ADSCs specifically as it relates to nursing services and therapeutic services.

Chapter 3 contains an exploration and description of the research methods and the research design employed in the study as well as a discussion on the dataset and data analysis. There is an explanation of the population as well as the sampling procedures, recruitment, and data collection method. Chapter 3 also includes a discussion on the plan data management, instrumentation, validity, and reliability, as well as ethical procedures.

Chapter 3: Research Method

Introduction

The purpose of this correlational study is to determine if there is a predictive relationship between the determinants of health and the availability of therapeutic services and nursing services provided at ADSCs in the United States. This chapter includes an overview of the methodology and research design for the study, as well as my rationale for using this approach to answer my research questions. Also, this chapter contains a discussion of the sample, population, and measures that will be used to safeguard privacy and maintain the integrity of the data. Chapter 3 also contains information regarding the data collection procedures, instrumentation, and data organization and analysis.

Research Design and Rationale

The independent variables for the research questions are the following: socioeconomic and environmental determinants of health (staff profile, number of clients, ownership type, licensure/certification, funding type, and model type). The dependent variable for RQ1 is therapeutic services (physical, occupational, or speech therapy). The dependent variable for RQ2 is nursing services (RN, LPN). This study is a correlational, nonexperimental design because the primary purpose is to use secondary data to examine how well the independent variables predict the likelihood of the dependent variables occurring. According to Babbie (2013), when examining relationships between variables, a quantitative design is more appropriate as it uses measurements and statistical analysis. This nonexperimental design is most appropriate for the study due to the use of archival

data and no manipulation of the independent variable was done (see Salkind, 2010). This study is designed to address predictive relationships versus cause and effect.

A correlational design is the most efficient and appropriate way to answer my research questions. Selecting my research design and methodology involved considerations regarding time constraints, the amount of de-identified data available, ease of access, and cost. It was not necessary to recreate what has already been done by a reputable organization. According to Rea and Parker (2014) and Trochim (2018), research done with the use of surveys has proven to be efficient especially with the larger population sizes. The data obtained by the CDC is important and relevant, so there is no need to duplicate the study. Using the secondary data from the CDC decreased subject burden and was cost-effective (see Jones, 2010).

According to Cheng and Phillips (2014), the use of archival data may be question-driven or data-driven. The use of secondary data in this study was both question-driven and data-driven. I originally had an idea regarding my research questions and searched to find datasets with variables that would be able to address the research questions. I found valuable datasets, but they did not contain all the variables I would need to answer my research questions. My research questions were then modified based on the available data. This dataset is critical to the dependent variables and the advancement of knowledge in ADSCs and the services provided.

Methodology

Population

Study clients or target population were ADSCs in the United States identified as members of the NADSA (CDC, 2018b) and were in operation prior to August of 2016. According to the CDC (2018b), these centers had to also self-identify as adult day care, adult day services, or adult day health centers. The target population size was 5,349 as that is what was reported by the NADSA (CDC, 2018b). All data related to the variables were requested from the CDC once my study was approved by Walden IRB.

Sampling and Sampling Procedures

According to the CDC (2018b), the sample for the study was drawn from a population of ADSCs throughout the United States. The sampling procedure was purposeful as its selection of ADSCs would provide them with the necessary data to conduct the study (Walker, 2012). The NADSA provided the NCHS with a sampling frame of 5,349 ADSCs. After the deletion of duplicates, the final sampling frame was 5,348, but only 2,836 of them were used in the study after checking for completion of the questionnaire (CDC, 2018b). According to the CDC (2018b), the clients did not receive any incentives to participate, and they were informed of how the results of the survey would be used.

The inclusion and exclusion criteria that led to the final sampling frame of 5,348 ADSCs were as follows:

- be licensed or certified by the state specifically to provide adult day services, or accredited by the Commission on Accreditation of

Rehabilitation Facilities (CARF); or authorized or otherwise set up to participate in Medicaid (Medicaid State plan, Medicaid waiver, or Medicaid managed care) or part of a Program All-Inclusive Center for the Elderly (PACE);

- have one or more average daily attendance of clients based on a typical week; and
- have one or more clients enrolled at the center, at the location, at the time of the survey (CDC, 2018b)

According to the CDC (2018b), any ADSCs that did not meet the criteria outlined above were excluded from the study. The basis for the components of the ADSCs survey came from the census of U.S. centers. Centers that were identified as invalid or out of business were excluded from the study (CDC, 2018b). In addition, centers that only completed eligibility questions were removed from the sample resulting in the final sample frame of 2,836 (CDC, 2018b).

For this study, I used the sample size of 2,836 provided by the CDC. The sample size was adequate as indicated by a G*Power analysis with the G*Power 3.1 software. According to Faul, Erdfelder, Buchner, and Lang (2009) the G*Power 3.1 software has improvements in logistic regression coefficients. Using the G*Power 3.1, the minimum sample size is 568 for logistic regression with an Alpha of 0.05, Power (β) of 0.80, and Effect Size of 0.80. The sample size and output will be addressed in the subsequent section.

Power Analysis

According to Portney and Watkins (2015), a one-tailed analysis is more appropriate when it is impossible for the differences to go in the opposite direction. Field (2013) posited that a one-tailed test states the direction of the relationship. Based on the information provided by the above authors, a one-tailed test was more appropriate for this study. A large sample size provided greater statistical power (Portney & Watkins). For this study, I had a sample size of 2,836. The sample size of *N*=2,836 allowed for generalizations. According to Laerd Statistics (2016), a minimum of 15 cases per independent variable is needed for logistic regression. This study contains six independent variables, based on the assumptions of logistic regression; the desired sample size is *N*=90. The G*Power 3.1 software was used to determine a statistically calculated minimum sample size for logistic regression with an Alpha (α) of 0.05, Power (β) of 0.80, and Effect Size of 0.80. The result was 568, as indicated by the output (See Figure 1).

z tests - Logistic regression

Options:	Large sample z-Test, Demidenko (2007) with var corr		
Analysis:	A priori: Compute required sample size		
Input:	Tail(s)	=	One
	Odds ratio	=	1.3
	Pr(Y=1|X=1) H0	=	0.2
	α err prob	=	0.05
	Power (1-β err prob)	=	0.80
	R^2 other X	=	0
	X distribution	=	Normal
	X parm μ	=	0
	X parm σ	=	1
Output:	Critical z	=	1.6448536
	Total sample size	=	568
	Actual power	=	0.8005867

Figure 1. Protocol of power analyses.

The effect size must also be considered in power analysis. The effective difference between the groups is greater when there is a larger effect size (Portney & Watkins). For this study, an effect size of .80 (large) was used. In discussing power, a value of .80 is good to aim for (Field 2013; Portney & Watkins, 2015). A power analysis helps with estimating the appropriate sample size needed for recruitment as well as for determining if a Type II error has occurred if the results of the study are nonsignificant (Portney & Watkins, 2015). According to Portney and Watkins (2015), the odds ratio is more effective in interpreting regression coefficients than probability. Faul, Erdfelder, Lang, and Buchner (2007) reported that an odds ratio of 1.3 is effective in logistic regression and will provide valid statistical results. The odds ratio for this study is 1.3; alpha level is 0.05, and power is 0.80.

Archival Data

The archival data used in this study was retrieved from the CDC. Archival data is referred to as secondary data due to its availability in historical records, documents, or databases (Elmes et al., 2011). According to Mitchell and Jolley (2012), the use of archival data in nonexperimental research is beneficial in that it allows researchers to explore relationships among many variables. Recruitment procedures and ADSCs who provided the data will be discussed per the CDC protocol.

The 2016 Adult Day Services Center Questionnaire took place between August 2016 and February 2017 with a data frame provided by the NADSA (CDC, 2018a). The eligibility criteria for the ADSCs to participate in the study were: (a) be included in the NADSA database; (b) have state licensure or certification to provide ADSCs, or

authorized to participate in Medicaid; (c) have an average daily attendance of one or more in a week; and (d) have one or more clients enrolled at the time of the survey (CDC, 2018a). Adult day services centers that did not meet the criteria were excluded from the study.

The ADSCs had the option to participate in the survey by a hard copy mail questionnaire, a web questionnaire, or a computer-assisted telephone interview (CDC, 2018a). According to the CDC (2018b), the ADSCs were divided into three groups. Group one received a technical advance letter, group two received a less technical advance notification letter, and group three did not receive an advanced notification letter. The purpose of the advanced notification letter from the director of NCHS was to highlight the importance of the 2016 Adult Day Services Center Questionnaire (CDC, 2018b). According to the CDC (2018b), the letter contained information on the purpose of the survey as well as a notification of the questionnaire packet that will follow.

According to the CDC (2018b), 5 to 7 days after the advance notification letter was sent, the first questionnaire packet was mailed with a cover letter from the NCHS director. The letter contained information pertaining to the web login, provider-specific results from the 2014 questionnaire, national provider association letters of support a confidentiality brochure from the CDC, the questionnaire, and a business reply envelope that was pre-addressed and had pre-paid postage (CDC, 2018b). According to the CDC (2018b), about one week from after the second questionnaire packets were mailed out, a thank you/reminder letter was sent to the ADSCs. The purpose of this letter was to encourage those who had not completed and returned the questionnaire to do so and to

thank those who did (CDC, 2018b). The ADSCs that did not respond to previous mailings received two additional follow-up questionnaire packets and reminder letters or emails. According to the CDC (2018b), about a month after the second follow up questionnaires were sent, ADSCs that did not respond were called by telephone interviewers. Those ADSCs that did not complete the survey either by web or mail by mid-September 2016 were given a full computer-assisted telephone interview (CDC, 2018b). Once all the data was collected, it was edited for accuracy, consistency, completeness, and logicality (CDC, 2018b).

The data from the 2016 Adult Day Service Questionnaire is publicly available; however, access to restricted data required special permission. To gain access to the data set, I submitted a written proposal to NCHS' Research Data Center and Walden University IRB. The conditions for using the data were as follows:

- Data must only be used for analysis and statistical reporting
- Do not try to make use of any identity of person or establishing
- Report any errors in the data file
- Inform the Long-term Care Statistics Branch of any publications or presentations based on the data
- Cite relevant National Study of Long-Term Care Providers documentation/data when appropriate. (CDC, 2018a).

In addition to the proposal, there was a Student Advisor Agreement that had to be reviewed and signed by the student (myself) and the advisor (Chair) that is guiding the research. The agreement states that the student and advisor will abide by all the rules and

restrictions of the NCHS Research Data Center. Other documents that were included to use with the data file are data dictionary or codebook, the survey questionnaire, and the methodology documentation (CDC, 2018a; CDC, 2018b). Amendments to the proposal could be done later as the research evolves; however, the Research Data Centers analyst must be made aware, and the amendment must include the date, the changes and why, highlight, or "tracking" of changes. There were no amendments to the proposal for this study.

Instrumentation

According to Frankfort-Nachmas et al. (2014), addressing the validity of the data collection process is important in maintaining the integrity of the research and the validity of the data collected. According to personal communication from the CDC, there is no data or documents on the reliability or validity of the National Study of Long-Term Care Providers 2016 Adult Day Services Center Questionnaire (T. McNeil, personal communication, March 14, 2017). However, the measures in the National Study of Long-Term Care Providers 2016 Adult Day Services Center Questionnaire are derived from measures in previously fielded studies such as the National Nursing Home Survey, National Home and Hospice Care Survey, and the National Survey of Residential Care Facilities. The measures are also derived from studies elsewhere in the National Center for Health Statistics (T. McNeil, personal communication, March 14, 2017).

According to Frankfort-Nachmias et al., 2014, when discussing reliability, the focus is on accuracy, trustworthiness, and reputability of the data. This reliability lends to the accuracy of the results of the study. According to personal communication received

from T. McNeil from the CDC on March 14, 2017, most of the previously used instruments have been used numerous times in pretests, pilots, or full surveys. Over the years, the CDC has cognitively tested the National Study of Long-Term Care Providers 2016 Adult Day Services Center Questionnaire and made tweaks based on the results (T. McNeil, personal communication, March 14, 2017). The CDC also continually benchmark to make sure the data match other national or state findings (T. McNeil, personal communication, March 14, 2017).

The instrument used for data collection was the 2016 Adult Day Services Center Questionnaire, which is publicly available on the CDC website. The survey was developed by the National Center for Health Statistics and the Division of Health Care Statistics operating under the CDC. The OMB control number is 0920-0943, with an expiration date of 05/31/2019. This instrument is appropriate to the current study in that the data obtained by the CDC is important and relevant, so there is no need to duplicate the study. The study provides a national picture of providers and services that will allow generalization of the results.

Operationalization of Constructs

Research Question 1 was the following: Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services? Research Question 2 was the following: Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services? The independent variables for both research questions were the following: socioeconomic and environmental determinants of health (ownership type, licensure/certification type, staff

profile, number of clients, funding type, and model type). The dependent variable for RQ1 was therapeutic services (PT, OT, speech therapy). The dependent variable for RQ2 were nursing services (RN, LPN).

Data Analysis Plan

The data from the 2016 Adult Day Service Questionnaire was requested from the NCHS Research Data Center. The data from the 2016 Adult Day Service Questionnaire is publicly available; however, access to restricted data required special permission to order to protect the confidentiality of the clients. To gain access to the data set, I submitted a written proposal as well as the Student Advisor Agreement to NCHS' Research Data Center and Walden University IRB. Once the RCD approved the proposal, I was assigned a researcher from RDC to work with me in creating a data file specific to my research questions.

Once the RDC researcher approved my proposal, I made arrangements to visit the CDC in Atlanta to access the data as it was not available remotely. There was a setup fee and a fee for each day you spend at the site analyzing the data. I spent one day. The RDC researcher converted the data from SAS-callable SUDAAN into SPSS. In addition to the restricted data, I had access to a data dictionary or codebook, the survey questionnaire, and the methodology documentation (CDC, 2018a; CDC, 2018b), which is publicly available. Everything I needed was placed on a computer specific to me in the RDC. No outside notes etc. was allowed and phones had to be placed in a locker.

The SPSS statistical software (SPSS 19) was used to analyze the data. Data cleaning was also be done by using SPSS to check the validity of the variables. I assessed

and reviewed the dataset for any missing data. Any changes to the data was documented. If data for any of the variables are missing, it was removed from that record to allow for generalizability appropriate power in the statistical test (Mertler & Vannatta, 2017).

Descriptive statics was obtained to provide a summary of the data. According to Mitchell and Jolley (2012), descriptive statistics allows the research to explore and describe the variables being studied. In addition, frequencies and percentages was used to describe the variables. Using the data obtained from the survey, I used binomial logistic regression analysis to examine the predictive relationships among the variables and test the hypotheses provided parametric and non-parametric procedures are met. The log (*logit*) addressed the assumption of linearity to determine if the significance of the interaction between the independent variable and the log transformation (Field, 2013). I also checked the assumptions for regression analysis, such as outliers, independence of errors, and multicollinearity (Field, 2013).

The goodness-of-fit statistics was used to assess the overall fit of the logistic regression model and the reduction of errors (Field, 2013). The Nagelkerke *R* Square was used to assess the variability of occurrence in the dependent variables accounted by the independent variables. The statistics that was reported included the significance level, the odds ratio, the classification accuracy of the regression model, F-tests, confidence intervals, and the reduction in errors due to the regression model.

Research Questions and Hypothesis

RQ1: Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services?

$H_0$1: Socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering therapeutic services.

H_a1: Socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering therapeutic services.

RQ2: Socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services?

$H_0$2: Socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering nursing services

H_a2: Socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering nursing services.

The statistical test that was used to test the hypotheses is a binomial logistic regression for both research questions. I explored the statistically significant differences across determinants of health and therapeutic services and nursing services provided.

Threats to Validity and Reliability

According to Frankfort-Nachimas et al. (2014), addressing the validity of the data collection process is important in maintaining the integrity of the research and the validity of the data collected. This process helps in the detection of possible errors. The threats to validity are usually determined not only by the data collection process but also based on the type of design, sampling, and data analysis (Mertens, 2013; Pedhazur & Schmelkin, 2013). Threats to internal validity are not relevant to this study as it was non-experimental (Mertens, 2013).

According to the CDC (2018b), a potential threat to the validity of the study was that each ADSCs self-selected to participate in the survey. The reliance on this voluntary method of recruiting clients could significantly limit the number of clients and responses, which may have affected sample size. The use of a multimode survey protocol (mail, web, computer-assisted telephone interview) helped to rectify this possible threat to validity (CDC, 2018b). Edit checks were programmed into the questionnaire completed via the web to check consistency, ensure the internal validity of the data (CDC, 2018b) and generalization.

According to the CDC, estimates from the survey met reliability criteria based on the relative standard error (RSE or coefficient of variation). The RSE is determined by "dividing the standard error of an estimate by the estimate itself" (CDC, 2018b, p. 7) and then converting to a percentage. Estimates of 60 or more sampled cases and an RSE of less than 30% were considered reliable and used in the study (CDC, 2018b). RSE with an estimate of 30-59 sample cases and more than 30% was not considered reliable. Sample cases with less than 30 were indicated with a (*) and not reported (CDC, 2018b). The CDC has set guidelines for enhancing the accuracy and reliability of survey data (CDC, 2018b).

Ethical Procedures

Confidentiality standards were followed by NCHS to ensure the non-disclosure of respondents. This study did not involve any human clients. Rather, de-identified secondary data was analyzed from NCHS questionnaire. I kept this data confidential by ensuring that all identifiers was permanently removed and that no specific individual or

facility can be identified. Therefore, this study does not pose any ethical concern for human clients or the facilities involved.

IRB approval was obtained from Walden University at the completion of the proposal and before using the data. The IRB approval number (IRB# 03-08-19-0379942) was provided with the Student Advisor Agreement as part of the request to access the data from the NCHS Research Data Center. There was no direct contact with participants, so informed consent was not required. In addition, once the data was retrieved from the NCHS, it was safeguarded on a computer that is password protected.

Summary and Transition

This study explored to what degree do determinants of health variables predict the likelihood that ADSCs offers therapeutic services or nursing services. A quantitative approach using a correlational design was used to examine the archival data from the CDC. Binomial logistic regression was used as the statistical test of analysis using SPSS software. Chapter 3 included an overview of the research methodology and design; population and sample, data collection procedures; instrumentation, and the plan for data analysis. Chapter 4 offers more detailed information and discussion of data collection, results, data analysis and a summary of the research questions.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to determine if there is a predictive relationship between the determinants of health (staff profile, number of clients, ownership type, licensure/certification, funding type, and model type) and the availability of therapeutic services and nursing services provided at ADSCs in the United States. I conducted the research using secondary data from The National Study of Long Term Care Providers 2016 Adult Day Services Center Questionnaire. The research questions and hypotheses were as follows:

Research Questions and Hypotheses

RQ1: Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services?

$H_0$1: Socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering therapeutic services.

H_a1: Socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering therapeutic services.

RQ2: Socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services?

$H_0$2: Socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering nursing services

H_a2: Socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering nursing services.

This chapter is organized around the research questions and the associated hypotheses. In this chapter, I described the data collection process and timeframe used by the CDC in the dataset. I also discussed the results from the statistical analyses I performed. I then conclude the chapter with a summary of the findings as they relate to the research questions.

Data Collection

I used a secondary data set from The National Study of Long Term Care Providers 2016 Adult Day Services Center Questionnaire. The data was accessed on-site at the CDC in Atlanta, Georgia. Permission to access the data was requested and granted by both the Walden University IRB and the CDC. The RDC researcher assigned to me downloaded the data onto a computer within the CDC research center and imported it into SPSS 19 for analysis.

The NCHS has conducted the National Study of Long-Term Care Provides Adult Day Services Center Questionnaire every 2 years since 2012 (CDC, 2019a). The survey provides the CDC with information about long-term care that may inform policy, service provision, research, and practice (CDC, 2019a). The 2016 Adult Day Services Center Questionnaire was used for this study and was comprised of responses provided by 2,836 ADSCs. Clients completed the survey via a mail-in questionnaire, computer-assisted interview, or a web questionnaire (CDC, 2018a). The time frame for data collection was August 2016 through February 2017, with a response rate of 61.8% (CDC, 2018a). The response rate is representative of 4,600 ADSCs nationally, and 286,300 clients served.

Response rates varied by states from 46% to 94% and were calculated using the AAPOR's Response Rate 4 (CDC, 2018b).

The sample consisted of 4,600 ADSCs provided by the NADSA, and the ADSCs are from all states and the District of Columbia. ADSCs that had multiple centers at the same address were included as separate centers and all duplicates were deleted (CDC, 2018b). Of the 4,600 ADSCs surveyed, only 2,836 completed the survey and participated in the study (CDC, 2018b). The CDC (2018b) used the Office of Management and Budget's (OBM) September 2006 Standards and Guidelines for Federal Statistics to report weighted and unweighted response rates. The total population that is measured by respondents is measured as weighted rates/proportion (CDC, 2018b). The proportion of the sample that responded was represented by unweighted rates (CDC, 2018b). The survey provides a national picture of providers and services, allowing for generalization of the results.

According to the CDC (2018b), the ADSCs were randomly divided into three groups as part of a methods experiment. The first group received a technical advance notification letter, the second group received an advanced letter that was less technical, and the third group did not receive an advanced notification letter. A packet with a cover letter from the NCHS was sent 5-7 days after the advanced notification letter. It included information on how to login to the web survey as well as results from the 2014 survey that was specific to that ADSC (CDC, 2018b). The packet also contained a national association provider letters of support, a provider-specific questionnaire, a business reply envelope that was addressed and stamped, as well as a CDC confidentiality brochure

(CDC, 2018b). A week later, another packet was mailed with thank you letters to those who submitted their surveys and reminders to those who did not (CDC, 2018b). ADSCs that did not respond were mailed two additional follow-up questionnaire packets with reminder letters. Four weeks following the second packet, telephone interviewers called ADSCs that did not submit mail or web surveys by mid-September 2016 (CDC, 2018b). These centers were selected for the computer-assisted telephone interviews to complete the survey (CDC, 2018b).

Study Results

Assumptions

Binary logistic regression is used to predict membership of two categorical outcomes (Field, 2013). According to Laerd Statistics (2019), the following assumptions must be met to determine that binary logistic regression is the appropriate statistical test to analyze the data: (a) a dichotomous dependent variable, (b) one or more independent variables, which can be either continuous variables or nominal variables, (c) independence of observations, (d) mutually exclusive and exhaustive dichotomous dependent variable and all nominal independent variables , and (e) a minimum of 15 cases per independent variable.

The assumption that the dependent variables are dichotomous was met as both dependent variables (Y) only had a *yes/no* response. Logistic regression assumes that the function P (Y = 1) is the probability of the event occurring; it is, therefore, necessary that the dependent variable is coded accordingly. The data contains seven independent variables that are nominal. The sample size requirement was met as I had a sample size of

2,836 (n = 2,836). According to the G*Power 3.1 software that I used, a statistically calculated minimum sample size for logistic regression was 568 with an alpha of 0.05, power of 0.80, and an effect size of 0.80. This is consistent with the statistical assumption stipulating that a minimum of 15 cases per independent variable is expected when performing binary logistic regression. For this study, I had six independent variables combined for both RQs, which would be a sample size of 90. When seeking to establish a predictive model, it is best to select a large sample size. In using simple binomial logistic regression, there was no need for a linear relationship between the dependent and independent variables, and it was not necessary for the independent variables to be multivariate normal or have homoscedasticity (Laerd Statistics, 2019).

A codebook, descriptive statistics, and frequency tests were done to observe a basic summary and description of the data. I recoded the data (total number of clients served, funding type, and staff profile) into ordinal or categorical measurements instead of scale to ensure the assumptions for binomial logistic regressions were met. According to Portney and Watkins (2015), recoding is beneficial because it facilitates statistical analysis in logistic regression. I also ensured that the codebook represented the correct coding of the variables with the appropriate measurements and values. According to Portney and Watkins (2015), it is necessary to use descriptive analyses to ensure that the statistical tests were used correctly, and the interpretations are valid.

The frequencies check ensured there were no missing data fields in the data set. The CDC research center had adjusted for missing cases using the variable factstrat, which indicates the sampling stratum. The sample analyzed was n = 2836. Table 3

provides descriptive information of the sample specific to census region, licensure type, model type, staffing profile, number of clients served, funding type, ownership type and the provision of nursing and rehabilitation services.

Table 3

Descriptive Statistics of Independent and Dependent Variables (n=2,836)

Variable	Number	Percentage
Census region		
Northeast	572	20%
Midwest	517	18%
South	957	34%
West	790	28%
Licensed		
Yes	2612	92%
No	218	8%
Model type		
Social Model	2442	86%
Medical Model	372	13%
No Response	22	1%
Staffing by nurse		
Yes	2603	92%
No	0	0%
No Response	233	8%
Number of clients served		
Small	1898	67%
Medium	645	23%
Large	293	10%
Funding type		
Government	2265	80%
Private	444	16%
No Response	127	4%
Ownership type		
Not for profit	2656	94%
For Profit	132	5%
No Response	48	1%
Nursing services provided		
Yes	1957	69%
No	633	22%
No Response	246	9%
Therapeutic services provided		
Yes	1824	64%
No	762	27%
No Response	250	9%

Regression analyses were run by entering the six independent variables into a stepwise regression against the outcome variables for the provision of nursing and the provision of therapeutic services. Table 4 shows the Model Summary for Nagelkerke *R* Square of .063 for the provision of therapeutic services and .110 for the provision of nursing services. Both are appropriate as the Nagelkerke *R* ranges from 0 to 1.

Table 4

Model Summary for Nagelkerke R Square

Dependent variables	-2 Log likelihood	Nagelkerke R^2
Therapeutic services	2892.897[a]	.063
Nursing services	2589.571[a]	.110

A binomial logistic regression analysis to investigate RQ1 if socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services were conducted. The predictor variables, licensure type, model type, staffing profile, number of clients served, funding type, and ownership type was tested a priori to verify there was no violation of the assumption of the linearity of the logit. The predictor variable, the type of model, the total number of clients, and the funding type for RQ1 in the logistic regression analysis were found to contribute to the model. Please see table 5 for details regarding RQ1. For RQ1, the unstandardized Beta weight for the Constant; *B* = .513, *SE* = .221, *Wald* = 5.374, *p* = .020. The unstandardized Beta weight for the predictor variable type of model: *B* = 1.390, *SE* = .194, *Wald* = 51.356, *p* < .001. The estimated odds ratio favored an increase of nearly 2% [*Exp (B)* = 4.016, 95% *CI* (2.746,

5.873)] for therapeutic services every four unit increase of the type of model. The unstandardized Beta weight for the predictor variable total number of clients: B = .469, SE = .103, *Wald* = 20.967, $p < .001$. The estimated odds ratio favored an increase of 60% [*Exp (B)* = 1.599, 95% *CI* (1.306, 1.954)] for therapeutic services of every unit increase of the number of clients. The unstandardized Beta weight for the predictor variable funding type: B = .306, SE = .123, *Wald* = 51.356, p = .013. The estimated odds ratio favored an increase of nearly 4% [*Exp (B)* = 1.358, 95% *CI* (1.067, 1.746)] for therapeutic services of every unit increase of the funding type.

Table 5

Variables in the Equation for Therapeutic Services

Independent variables	B	*SE*	Wald	*Df*	Sig.	Exp(B)	95% *CI* for EXP(B) Lower	Upper
Region	.194	.094	4.203	1	.40	1.214	1.009	1.460
Licensed	.254	.177	2.056	1	.152	1.289	.911	1.824
Model Type	1.390	.194	51.356	1	.000*	4.016	2.746	5.873
Funding	.306	.123	6.210	1	.013*	1.358	1.067	1.727
Ownership	-.080	.216	.137	1	.711	.923	.605	1.409
Num clients	.469	.103	20.697	1	.000*	1.599	1.306	1.954
Constant	.513	.221	5.374	1	.020	1.670		

Note: * indicates statistical significance

A binomial logistic regression analysis to investigate RQ2 if socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services were conducted. The predictor variables, licensure type, model type, staffing profile, number of clients served, funding type, and ownership type was tested a priori to verify there was no violation of the assumption of the linearity of the logit. The predictor

variable, the type of model, and the total number of clients for RQ2 in the logistic regression analysis were found to contribute to the model. Please see table 6 for details regarding RQ2. For RQ2, the unstandardized Beta weight for the Constant; $B = 1.562$, $SE = .248$, $Wald = 39.803$, $p < .001$. The unstandardized Beta weight for the predictor variable type of model: $B = 1.796$, $SE = .250$, $Wald = 51.509$, $p < .001$. The estimated odds ratio favored an increase of nearly 3% [*Exp (B)* = 6.027, 95% CI (3.690, 9.842)] for nursing services every six unit increase of the type of model. The unstandardized Beta weight for the predictor variable total number of clients: $B = .539$, $SE = .113$, $Wald = 22.823$, $p < .001$. The estimated odds ratio favored an increase of nearly 72% [*Exp (B)* = 1.715, 95% CI (1.375, 2.140)] for nursing services each unit increase of the number of clients.

Table 6

Variables in the Equation for Nursing Services

Independent variables	B	*SE*	Wald	*Df*	Sig.	Exp(B)	95% *CI* for EXP(B) Lower	Upper
Region	-.906	.113	64.070	1	.000*	.404	.324	.505
Licensed	.351	.189	3.425	1	.064	1.420	.980	2.058
Model Type	1.796	.250	51.509	1	.000*	6.027	3.690	9.842
Funding	.240	.129	3.437	1	.064	1.271	.986	1.638
Ownership	-.157	.236	.445	1	.505	.854	.538	1.357
Num clients	.539	.113	22.823	1	.000*	1.715	1.375	2.140
Constant	1.562	.248	39.803	1	.000	4.769		

Note: * indicates statistical significance

Summary

In Chapter 4, I provided information about the data collected from The National Study of Long Term Care Providers 2016 Adult Day Services Center Questionnaire in addition to the analysis of the results of my investigation. A binomial logistic regression was performed to determine if there is a predictive relationship between the determinants of health (staff profile, number of clients, ownership type, licensure/certification, funding type, and model type) and the availability of therapeutic services and nursing services provided at ADSCs in the United States.

The logistic regression model was statistically significant for RQ1 (Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services?), $\chi^2(6) = 112.028$, $p < .001$, and for RQ 2 (Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services?), $\chi^2(6) = 191.458$, $p < .001$. The model explained .063 and .110 (Nagelkerke R^2) for RQ1 and RQ2, respectively. The model correctly classified 71.2-75.5% of cases. Sensitivity was 100% for both research questions, and specificity was 0% for both research questions. Of the six predictor variables, only two were statistically significant: type of model and the total number of clients for both research questions.

The type of model of the ADSC had four times higher odds to offer rehabilitative services and six times higher odds to offer nursing services. The total number of clients at an ADSCs also had 1.599 times higher odds to offer rehabilitation services and 1.715 times higher odds to offer nursing services. Based on the results of the analysis, I have

rejected the null hypothesis that socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering therapeutic services and also that socioeconomic and environmental determinants of health are not predictors of the likelihood of ADSCs offering nursing services. Although licensure/certification type and funding sources were not statistically significant, they had an odds ratio of 1.420 and 1.271, respectively.

In Chapter 5, I will discuss my purpose for conducting this study. I will also present the findings of my research and how it compares to the literature. Finally, I will also include recommendations for action and further research as well as address the implications for social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to determine if there is a predictive relationship between the determinants of health (staff profile, number of clients, ownership type, licensure/certification, funding type, and model type) and the availability of therapeutic services and nursing services provided at ADSCs in the United States. I conducted this study to fill the gap in the literature regarding the predictive nature of determinants of health in ADSCs (see Anderson et al., 2013; Dabelko-Schoeny et al., 2016; Gaugler, 2014b) specifically as they relate to nursing services and therapeutic services. Results from the logistic regression analysis indicated that socioeconomic and environmental determinants of health are predictors of the likelihood of ADSCs offering therapeutic services and nursing services; therefore, I rejected the null hypothesis for both research questions and concluded that socioeconomic and environmental determinants of health may predict whether or not an ADSC offers therapeutic or nursing services.

In addition to summarizing the findings of this research, in this chapter, I also discuss the interpretations of the findings in the context of the theoretical framework and the existing literature. In addition, I address the limitations of the study and make recommendations for future research. I conclude the chapter with a discussion on the implications of the study for social change.

Interpretation of Findings

Alignment of Findings With Theory

The theoretical framework that guided this study was open system theory. The findings from the study aligned with system theory. Several of the variables that were significantly predictive are associated with elements of the system. Specifically, the model type (social versus medical), size of the facility as measured by the number of clients, and funding type (government versus private). The results showed that the social model is the largest model type, accounting for 86% of ADSCs, and it is predictive of therapeutic and nursing services being offered at ADSCs. However, it is also necessary to take into consideration that some ADSCs have a combined model. If ADSCs were marked as primarily social or only social, it was documented as a social model. If it was marked as primarily medical/health or medical/health only, it was documented as a medical/health model.

According to Jennings-Sanders (2004), social models are those that promote nutrition and recreation services, social activities, and maintenance of function. It could then be surmised that ADSCs with a social model comes from a community health and wellness promotion perspective as they look at the functional capabilities and emotional wellbeing of their clients. This approach is more holistic and is in alignment with systems theory and how each part is interrelated and interdependent on the next. The services may also be offered in a group versus an individual basis, and payment for the services may be all inclusive versus in a medical model. The services may need to be on an individual

basis, and the organization may need to show medical necessity for the billing of services.

The size of the facility, as measured by the number of clients at the ADSCs, is also a predictor of therapeutic and nursing services being offered by ADSCs. Small facilities account for 67% of ADSCs. Small facilities are defined as facilities that have 1 to 63 clients. As a reminder, the average number of clients served at an ADSC is 40 (CDC, 2019b). In alignment with systems theory, it can be theorized that smaller systems are easier to manage as it pertains to the organization and provision of services.

The third variable that plays a significant role in the provision of therapeutic services is the funding type. Funding type was significant for the provision of therapeutic services $p = .013$ but not for the provision of nursing services $p = .064$. Funding provided through government sources is the largest source of funding for ADSCs. Medicare, although a government provider, does not currently pay for ADSCs. According to the CDC (2019b), 77% of ADSCs were authorized or certified to participate in Medicaid. There are numerous factors that cannot all be accounted for with this single study (see Garavan, 2007).

Systems theory was appropriate for this study as it is a theoretical perspective that examines systems or organizations as a whole rather than separate parts (Mele et al., 2010) and allows for the consideration of numerous factors (Garavan, 2007). The results of this study showed that the type of model and the total number of clients was significant in the organization decision to offer therapeutic or nursing services. Staff profile, ownership type, licensure/certification, and funding type (for nursing), although not

significant, are part of the throughput or feedback loop that contributes to changes in the organization.

According to Buller and McEvoy (2016), open systems theory is appropriate in addressing systems that are dynamic, complex, and interconnected. ADSCs, as a system, use various resources (socioeconomic and environmental determinants of health: staff profile and the number of clients) as inputs. Policies, procedures, and protocols are the processes in the organizational systems that are transformed via throughputs (socioeconomic and environmental determinants of health: ownership type, licensure/certification, funding type, and model type). The output (environmental determinants of health: therapeutic and nursing services) is the outcome/services provided to the clients that are exported out of the system. In open system theory, there is a feedback loop that allows for continuous adjustments in inputs, throughputs, or outputs into the system (Buller & McEvoy, 2016). Social, physical, and financial environments influence business decisions on what services to offer and not offer. The findings from this binomial logistic regression extend the knowledge regarding ADSCS and how the provision of services is determined using a system theory approach.

Interpretation Pertaining to RQ1 and RQ2

The first research question was as follows: Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer therapeutic services? According to Brown et al. (2014), Marak (2018), and the NADSA (2018), only about 50% of ADSCs provide any therapeutic services. Brown et al., Marak, and the NADSA supported my findings of 64% of ADSCs that provide therapeutic services using in house

personnel as opposed to outsourcing the services. This means that the ADSCs either provided the services by paid employees or arranged for the service to be provided by outside service providers; otherwise, it was documented that they did not provide therapeutic services.

According to the findings from this study, the socioeconomic and environmental determinants of health that were significant in predicting the likelihood that ADSCs would offer therapeutic services were the type of model, the total number of clients, and funding type. Eighty-seven percent of ADSCs models are social models, and only 13% are primarily medical models. Although not statistically significant ($p = .040$), the Southern Region of the United States has the most (957 or 34%) ADSCs. A contributing factor may be due to the number of older adults living in the southern states. For example, Florida has the highest percentage of older adults of all the states (United Census Bureau, 2020). However, there is no logical rationale for one region having the most ADSCs, and, as noted in systems theory, there are numerous factors that cannot all be accounted for with this single study (see Garavan, 2007).

The total number of clients served was also significant, $p < .001$, in determining whether or not ADSCs provided therapeutic services and nursing services. According to the CDC (2019b), the average number of clients in ADSCs is 40. Harris-Kojetin et al. (2019) reported that there is a total of 286,300 clients enrolled in ADSCs throughout the United States. ADSCs' capacity ranged from two clients to a maximum of 530 (Harris-Kojetin et al., 2019). For this study, the size of the facilities was used as a way to indicate the number of clients enrolled at the ADSC. As was previously mentioned, small-sized

facilities were considered those with 1 to 63 clients. Medium-sized facilities were those with 64 to 128 clients, and large facilities were those with 129 or more clients. Sixty-seven percent of ADSCs were considered to be small sized facilities, meaning that they had 1 to 63 clients enrolled. Findings from Harris-Kojetin et al. showed that the West region has the highest capacity specific to how many ADSCs can be operational in that region for the number of clients allowed. However, as previously mentioned, results from this study indicated that the Southern region has the most ADSCs.

The second research question was as follows: Do socioeconomic and environmental determinants of health predict the likelihood that ADSCs offer nursing services? Ninety two percent of ADSCs were staffed by either an LPN or an RN. The results from my study indicated that, currently, 69% of ADSCs reported that they provided nursing services. This is consistent with the findings from the CDC (2019b) of 65% but is inconsistent with the NADSA (2018) finding that about 80% of ADSCs provides nursing services. Staffing of a nurse could be an RN or LPN employed full or part-time or an independent contractor/agency staff. Research regarding the role of nurses in ADSCs is scant (Jennings-Sanders, 2004), which makes it difficult to give a reasonable rationale for the disparity between 92% facilities being staffed by an RN or LPN and only 69% providing nursing services. Data about the provision of nursing services at the ADSCs was derived from responses to the question “This adult day services center provides or arranges for skilled nursing services-must be performed by an RN or LPN and are medical in nature” (CDC, 2018c, p. 6). It is likely that the nursing staff in the 2442 social model ADSCs in the sample practice from a community health perspective.

Some of these services may include family health education programs, caregiver respite programs, client advocates, and case management, which are not clinical in nature. Another factor may be that because ADSCs are not federally regulated, each state may decide what the role of the nurse is.

This study revealed no significant relationship between the funding type and the provision of therapeutic or nursing services. The statistical significance was $p = 0.013$ for therapeutic services and $p = 0.064$ for nursing services. ADSCs are funded by Medicaid, the Older Americans Act, the Veterans Administration, other federal, state, or local governments, out-of-pocket payments by the client or family, private insurance, or other sources (CDC, 2018c). For this study, Medicaid, the Older Americans Act, the Veterans Administration, and other federal, state, or local governments were all considered to be funded by the government whereas, out-of-pocket payment by the client or family, private insurance, or other sources were considered private funding.

ADSCs funded by the government was 84%, and private funding was 16%. Although not statistically significant $p > .001$, funding type estimated odds ratio favored an increase of 35% [*Exp (B)* = 1.358, 95% CI (1.067, 1.727)] for therapeutic services. Each unit increase of the funding type and an estimated odds ratio favored an increase of 27% [*Exp (B)* = 1.271, 95% CI (.986, 1.638)] for nursing services. According to Harris-Kojetin et al. (2019), Medicare did not reimburse services provided by ADSCs in 2016.

Limitations of the Study

Identification and mitigation of potential limitations associated with a study are important for future researchers to successfully replicate studies (Morrison et al., 2010).

Although I had a large sample size, the generalizability of the findings may be limited due to many variations of ADSCs in practice as well as in the literature. For example, ADSCs may follow a social model or a medical/health model (NADSA, 2018), and the findings of this study show that the model type is a significant predictor as to whether ADSCs provide therapeutic or nursing services. The large sample size and the use of purposeful sampling by the CDC mitigated the need for randomization in this study.

Bias is a limitation most researchers encounter. According to Smith and Noble (2014), bias can occur at any phase of the research process. However, most biases can be prevented through the selection of the most appropriate study design, implementation, and statistical tests to ensure the validity and reliability of the findings and interpretation of data (Smith & Noble, 2014). Sample bias was not an issue in this study as a large representative sample and replication of inquiry (see Babbie, 2013) was obtained from the data of the 2016 Adult Day Services Center Questionnaire. However, inadvertent bias may still be an issue as inadvertent bias often occurs when the researcher's preconceptions influence their research questions and methodology (see Elmes et al., 2011). The magnitude of inadvertent research bias is unknown (Elmes et al., 2011).

It was initially thought that a limitation of this study would be the use of secondary data from the CDC because the data are self-reported from ADSCs administrators or directors. The self-reporting of the ADSCs posed the possibility of biased reporting. According to Field (2013), bias must be looked at within three contexts: bias that affects the parameter estimates, bias that affects standard errors and confidence intervals, and bias that affects test statistics and *p*-values. If the test statistics are biased,

so will the conclusion of the study. Biased reporting was minimized or eliminated in this study by checking for and addressing outliers and violations of assumptions. Control of biases was filtered during data analysis, with the selection of the most appropriate study design. Although everything was done to control for biases, there is still no control over what the organization reported.

The data received from the ADSCs by the CDC were deemed valid and reliable, as it was not the first time the study was being conducted. The CDC is also regarded as a reputable organization. The 2016 Adult Day Services Center Questionnaire is the third wave of a questionnaire that took place in 2012, 2014, and now 2016. The CDC has specific guidelines for enhancing the accuracy and reliability of the data (T. McNeil, personal communication, March 14, 2017). Participation in the survey, although encouraged, was not mandatory, and not all ADSCs responded (2,836 completed the survey out of the 4,600 ADSCs). In using secondary data, it is difficult to control over operationalization of variables as well as ensuring that the unit of analysis is the same. For this study, the unit of analysis was the organization and is the same unit of analysis the CDC used as the questions were pertaining to the organization rather than the individual clients.

Recommendations

The unit of measurement for this study was the organization. Therefore, findings from this research study showed that future studies could focus on the impact of the rehabilitation and nursing services being provided in ADSCs. The 2018 survey that took place between July 2018 and February 2019 will have data on a random sample of

individual adult day services center clients. This is the first time that the survey will have data at the individual level versus the organization. It would be beneficial to know the functional status of the clients at centers that provide rehabilitation and or nursing services improve or stay at a high level compared to those who do not provide these services. The NCHS (2019) reported that clients in ADSCs required less assistance with activities of daily living (bathing, dressing, toileting, eating, getting into and out of bed, and walking) compared to those in skilled nursing facilities, residential care communities or receiving services from a home health agency.

The findings from this study also indicate that further research should be carried out to better understand the relationship between diagnoses of clients and the services available at the ADSCs. Finally, to further enhance the research findings and add to current knowledge, a mixed-methods approach should be strongly considered. Implementing these recommendations may further inform policymakers, consumers, and providers of long term care services, especially in the area of ADSCs.

Implications

Findings from this study may help to guide service provision in ADSCs and inform relevant policy decisions. There is potential for positive social change in programming, regulation, and advocacy. This social change is achievable by increasing awareness of clients, caregivers, case managers, and policymakers on how the determinants of health influence the provision of services in ADSCs.

The findings of this research study could assist public health providers and governmental agencies with the promotion of guidelines and interventions that may improve the experience of clients in ADSCs. Ultimately, the positive social change significance of this study could lay the foundation for future research related to ADSCs and the provision of services to meet the needs of consumers. Furthermore, the dissemination of the findings from this study may guide program development in ADSCs to better meet the complex needs of the older adult population. Disseminating the findings of this study through conferences and peer-reviewed journals could educate public health officials and organizational leaders about the importance of standardized programs/services in ADSCs.

Conclusions

The purpose of this quantitative study was to determine if there is a predictive relationship between the determinants of health (staff profile, number of clients, ownership type, licensure/certification, funding type, and model type) and the availability of therapeutic services and nursing services provided at ADSCs in the United States. The findings from this study imply that the number of clients/clients enrolled in ADSCs and the model type is significant in the availability of therapeutic services and or nursing services being provided at ADSCs. The results from the analysis also revealed that although not all the variables were significant in predicting the availability of services, they all contribute when the odds ratio is taken into consideration.

In 2050, the number of adults age 65 and older will increase from 47.8 million to 87.9 million, while those 85 and older will triple to 19 million (Harris-Kojetin et al.,

2019). As more and more people age, it is no surprise that they will need long term care and paying for long term care can be costly. However, if ADSCs are able to meet the needs of our elderly population at a lower cost than skilled nursing facilities, residential care communities, and even home care services while aging in place; then ADSCs is a viable long term care option and should be accessible for all. As can be surmised from previous research, including this study, a holistic preventive approach is necessary when working with older adults with various chronic conditions. This holistic approach should include services that will holistically focus on their physical, emotional, and psychosocial wellbeing. Studies such as this will lay the groundwork for future research to allow us to achieve this goal.

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