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Staffing Standards and Care Outcomes in For-Profit and Not-For-Profit Religious-Based Nursing Homes

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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

Vulnerable older adults residing in nursing homes continue to experience poor care outcomes due to nurse staffing levels that are below the levels required for maintaining their well-being. Studies have shown that patient care outcomes in nursing homes are related to nurse staffing standards/levels, which are affected by profit maximization on adherence to registered nurses and licensed nurse staffing standards. The purpose of this descriptive study was to determine if there was a relationship between adherence to staffing standards and care outcomes in for-profit (FP) and not-for-profit religious-based (NFPRB) nursing homes using the profit maximization theory. Research questions focused on the relationships that profit maximization and nurse staffing standards had on the quality of care outcomes measures and the differences between the nursing homes on these variables. Secondary data were collected from public database and analyzed using the descriptive and inferential statistics, nonparametric tests, and binary logistic regression. Findings showed that profit measures were not related to staffing standards and care outcome measures in the NFPRB. There was a significant relationship between FP nursing homes and standards to care outcomes in FP but not in the NFPRB nursing homes. FP nursing homes did worse than NFPRB on care outcomes. Further research, using qualitative and mixed methodologies, is needed to study the effects of profit measures on nursing home care outcomes. The results of this study can effect positive social change by informing policy makers and healthcare professionals/leaders, and, by reducing adverse events, untimely death, and positively affecting the quality of care and life of the frail and vulnerable older adults residing in nursing homes.

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Dedication

To God be the Glory for the Grace He Bestowed upon me during this process. To my late loving father who believed in me and hoped that I would attain greatness in education. Big thanks to my mother, who made the sacrifice and gave me the gift of high education when and where many did not believe in girls' education, I am very grateful mom. And, to my late loving father-in-law who used his educational experience, position, and substance to inspire and help many in his community to attain higher education. I love you, dad.

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Table of Contents

List of Tables v

List of Figures vii

Chapter 1: Introduction to the Study 1

Background 2

Problem Statement 5

Purpose 7

Research Questions and Hypotheses 8

Theoretical Framework 9

Nature of the Study 11

Definitions of Terms 12

Assumptions 16

Scope and Delimitations 16

Limitations 17

Significance 18

Summary 19

Chapter 2: Literature Review 21

Literature Search Strategy 22

Theoretical Foundation 23

Literature Review Related to Research Methodologies and Designs 28

Qualitative Method 28

Quantitative Method 28

Mixed Methods 29
Literature Review Related to Key Variables and Concepts.....30
Nurse Staffing Standards 30
Nurse Staffing Levels 35
The Relationship Between Nurse Staffing Standards and Staffing Levels..... 37
Falls…..... 43
The Relationship Between Nurse Staffing Standards/Levels and Falls..... 45
Pressure Ulcers..... 48
The Relationships Between Nurse Staffing Standards/Levels and Pressure Ulcers 51
Staffing Related Quality Deficiencies 56
The Relationship Between Staffing Standards/Levels and Quality Deficiencies..... 58
Profit Maximization..... 61
The Relationship Between Profit Maximization and Nurse Staffing Standards/Levels 64
Summary and Conclusion.....66
Chapter 3: Research Method.....68
Research Design and Rationale 69
Methodology.....70
Population 70
Sampling and Sampling Procedures 71

Operationalization of Variables 73
Data Analysis Plan 75
Research Questions and Hypotheses 76
Threats to Validity 79
Ethical Procedures 80
Summary 81
Chapter 4: Results 82
Introduction 82
Data Collection 83
Time Frame for Data Collection 83
Discrepancies in Data Collection 83
Representativeness of Sample 84
Changes in Analysis Plan 84
Results 86
Descriptive Characteristics 86
Evaluation of Statistical Assumptions 91
Statistical Analysis Findings 91
Research Question 1 91
Research Question 2 100
Research Question 3 102
Summary 104
Chapter 5: Discussion, Conclusions, and Recommendations 106

Introduction....106
Interpretation of Findings....106
Limitations of the Study....112
Recommendations....113
Implications....114
Conclusion....115
References....117

List of Tables

Table 1 Normality Test: Continuous Variables-RN/LN HPRD, Falls, PUs, Patient/Total Profit Margins 85

Table 2 Frequency Table Representing Types of Ownership 86

Table 3 Descriptive Statistics for the Continuous Variables: Profit Margins, Staffing Levels, Falls, and PUs in both Nursing Homes 87

Table 4 Descriptive Statistics for the Continuous Variables: Profit Margins, Staffing Levels, Falls, and PUs by Nursing Home Types 88

Table 5 Descriptive Statistics: Categorical Variables-RN/LN Staffing Standards and Staffing Related Deficiencies for all Nursing Homes 90

Table 6 Spearman's Correlation: Patient and Total Profit Margins, PUs, and Falls 92

Table 7 Binary Logistic Regression for PPM/TPM and Categorical Variables by NH Types 93

Table 8 Crosstabs: Relationship between RN Staffing Standard and F353 Deficiency Citation Counts 95

Table 9 Crosstabs: RN Staffing Standards and F354 Deficiency Citation Number Counts 95

Table 10 Crosstab: RN Staffing Standard and F353 Deficiency Severity 96

Table 11 Crosstab: LN Staffing Standards and F353 Deficiency Citation Number Counts 96

Table 12 Crosstab: LN Staffing Standards and F354 Deficiency Citation Number Counts 97

Table 13 Crosstab: LN Staffing Standards and F353 Deficiency Severity 98

Table 14 MWU Ranks: Relationship between RN Staffing Standards and Falls, PUs, Patient/Total Profit Margins 99

Table 15 MWU Ranks: LN Staffing Standards and Falls, PUs, Patient/Total Profit Margins 100

Table 16 Crosstab: Differences between NH Types on RN Staffing Standards..... 101

Table 17 Crosstab: Differences between NH Types on LN Staffing Standards..... 101

Table 18 MWU Ranks: NHs on RN/LN Hours Per Resident Day, Falls, and PUs..... 102

Table 19 Crosstab: Differences in F353/F354 Deficiency Citation Number Counts 103

Table 20 Crosstab: F353 Deficiency Severity 104

List of Figures

Figure 1. Model: Illustration of the theoretical foundation and variables of study 27

Chapter 1: Introduction to the Study

The issue of adequate nurse staffing levels in nursing homes continues to be a concern in the health care system for all geriatric health care professionals and organizations, patients' advocates, patients and their families, governments, insurers, as well as the public. As part of the 1987 Omnibus Budget Reconciliation Act (OBRA), the Nursing Home Reform Act (NHRA) was passed in response to concerns over quality of care, requiring that nursing homes have specified minimum nurse staffing levels on duty for 24/7 resident care (Dellefield, Castle, McGilton, & Spilsbury, 2015). In this research, I focused on investigating and comparing the extent to which for-profit (FP) and not-for-profit religious based (NFPRB) nursing homes (NHs) adhered to the government's minimum nurse staffing standards. Although it has been almost 30 years since the NHRA staffing standards were enacted, many NHs, particularly those that are FP, continue to be in violation of government regulations, while the older adult residents continue to suffer from health issues related to inadequate staffing (Dellefield et al., 2015; Harrington, Olney, Carrillo, & Kang, 2012; Lin, 2014; Park & Stearns, 2009).

The occurrences of staffing-related quality deficiencies in NHs necessitated a resident-centered and quality improvement oriented change or amendment of policy. It was, therefore, important to examine the extent to which these two categories of NHs adhered to the required nurse staffing levels. Similarly, it was necessary to understand the influence of profit maximization as a motivating factor in the use of adequate levels of nursing staff and its consequences on residents' care outcomes. Adherence to staffing standards means using appropriate nurse staffing levels for care delivery and spending an

adequate amount of time, in hours, for close monitoring, closer considerations of residents' issues, and prompt intervention. Implementation of the study results would prevent adverse events and improve residents' quality of care and life outcomes (Harrington, Stockton, & Hooper, 2014; Shin, Park, & Hyun, 2014). Cost of care would be reduced and rechanneled in taking care of other issues by all those involved in carrying the financial burden of these residents.

In this chapter, I describe the topic and the rationale for conducting the study, including the potential positive social change and study implications. I also discuss the contextual background, problem statement, purpose, and the nature of the study. I equally focus on the research questions and hypotheses, theoretical framework, concise definitions of concepts, scope and delimitations, significance, and limitations.

Background

Older adults in NHs continue to experience less than optimal outcomes due to lack of adherence to nurse staffing standards and its consequent insufficient staffing levels. Research has shown that there is a relationship between nurse staffing standards/levels and quality of care outcomes. Positive relationships were shown to occur with increased staffing standards/levels, resulting in improved quality care outcomes (Chen & Grabowski, 2015; Dellefield et al., 2015; Harrington, Olney, et al., 2012; Lee, Blegen, & Harrington, 2014; Lin, 2014; Paek, Zhang, Wan, Unruh, & Meemon, 2016; Shin 2013; Shin & Hyun, 2015). The researchers found that pressure ulcers (PUs), weight loss, falls, and other adverse events in NHs were related to staffing levels. NHs with poor quality outcomes were found to be more likely cited for staffing delinquencies

(McDonald, Wagner, & Castle, 2013). Not all of the literature reviewed reported the clear relationship between adequate staffing levels and positive outcomes. Four studies found conflicting evidence with no relationships between increased staffing standards/levels and process or outcome measures (see Backhaus et al., 2016; Lee et al., 2013; Matsudaira, 2014; Park & Stearns, 2009). For instance, Lee et al. (2013) found no relationship between registered nurses' staffing hours and urinary tract infection, loss of weight, and use of antipsychotic medication and urinary catheter. However, Backhaus et al. (2017), Leland, Gozalo, Teno, and Mor (2012), and Shin and Hyun (2015) found mixed relationships between staffing levels/hours of resident per day and PUs or falls.

In the studies that focused on nurse staffing standards adherence, findings showed that the facilities that were operating with lower staffing levels prior to the new requirements increased staffing levels while those that were already operating at/or above the required standards reduced total staffing or substituted licensed practical nurses (LPNs) or licensed vocational nurses (LVNs) with less paid certified nurse aides (CNAs)/nurse aides (NAs) (Bowblis, 2011; Bowblis & Ghattas, 2016; Chen & Grabowski, 2015; Park & Stearns, 2009; Matsudaira, 2014). While some NHs were found to be out of compliance with staffing standards, some that complied did not experience significant improvement in all the quality of care measures (Bowblis & Ghattas, 2016; Matsudaira, 2014; Park & Stearns, 2009). Towsley, Beck, Dudley, and Pepper (2011) stated that even though most rural NHs were doing better on staffing than the homes in the urban areas, 87% were below national staffing standards. Lower than required staffing standards/levels and poor quality of outcomes were commonly seen in the NHs

that were FP compared to the NFP NHs (Harrington, Olney, et al. 2012; Harrington, Stockton, & Hooper, 2014; Park & Stearns, 2009).

Despite the availability of studies on minimum staffing standards and/or regulations and their impact on quality outcomes for NHs' residents, studies that particularly compared adherence to staffing standards and quality of care outcomes in FP and NFPRB NHs were found to be rare. In this study, I intended to fill the gap in the literature by comparatively examining the differences in adherence to staffing standards/ levels and the effects of such behaviors on residents' care outcomes between FP and NFPRB NHs. Furthermore, although previous researchers addressing staffing standards/levels in NHs concluded that FP NHs had worse staffing related quality outcomes than those that are NFP (Aaronson, Zinn, & Rosko, 1994; Harrington, Olney, et al., 2012), it was very rare to find studies that used the profit maximization theoretical framework to examine the relationships between these variables.

In this study, therefore, I expanded the knowledge and contributed to the discipline by using profit maximization theory (PMT). As a theoretical lens, PMT contributed to an understanding of microeconomic behaviors of NHs operators as they seek to maximize their economic utility and profit while minimizing costs in relation to adherence to nurse staffing standards/levels (Alhabeeb & Moffitti, 2013; Simon, 1959). The study was needed to fill in these gaps and, most importantly, to improve the lives and give voice to the older adults residing in NHs.

Problem Statement

More than 1.4 million frail and vulnerable older adults reside and/or receive care services by health care providers in the nation's more than 15,600 diverse types of NHs (Center for Medicare and Medicaid Services [CMS], 2016) which include FP, NFP, privately owned, government owned, and NFPRB types. A personal working experience showed that the residents in NHs were inadequately cared for when there was inadequate staffing of nurses. Hence, staffing of an adequate number of nurses is important for the older adults' care delivery in NHs. This frail and vulnerable population continues to experience neglect and poor care outcomes in the hands of their health care services providers, resulting from the nonadherence to minimum nurse staffing standards. Quality and safe care outcomes, a significant issue for the NH residents, were found to lag behind the expected quality care indicators (Castle & Fergusson, 2010; Dellefield, et al., 2015; Harrington, Olney, et al., 2012; Harrington, Schnelle, McGregor, & Simmons, 2016; Lin, 2014; Shin, 2013).

Researchers have concluded that optimal or poor care outcomes and safety in NHs are related to nursing staffing hours per resident day adequacy or its lack thereof (Chen & Grabowski, 2016; Lee et al., 2015; Lin, 2014; Paek et al., 2016). Although there are government regulations and standards guiding staffing of nurses in NHs, researchers have identified lack of adherence to staffing regulations, inadequate levels of nurse staffing, and focus on profit making as having a causal relationship with the prevalent poor care outcomes (Castle & Fergusson, 2010; Harrington, Olney, et al., 2012; Harrington et al., 2014; Lee et al., 2015; Lerner, 2013; Lin, 2014; Shin, 2013; Shin et al., 2014; Zhang,

Unruh, & Wan, 2013). These poor outcomes include repeated bladder/bowel incontinence, incessant use of indwelling catheter, falls, frequent use of physical restraints, fecal impaction, weight loss, pressure ulcer, and fractures.

In particular, most NHs that are FP were found to be in violation of staffing regulations and had the most serious problems with the CMS's NH quality of care indicators' outcomes (CMS, 2017; Geraedt, Harrington, Shumacher, & Kraska, 2016; Harrington, Olney, et al., 2012; Harrington et al., 2014; Hsu, Berta, Coyte, & Laporte, 2016; Lin, 2014; Park & Stearns, 2009). Compared to the NFP NHs, researchers showed that FP NHs had inadequate registered nurse (RN) staffing levels, lower nurse staffing levels, insufficient total nursing hours per resident day, increased patient to staff ratio, and frequent substitution of cheaper staffing labor of CNAs/NAs and LPNs for RNs (Caravan, Aldridge Carlson, Sipsma, & Bradley, 2013; Harrington, Olney, et al., 2012; Paek et al., 2016; Paul III, Godby, Saldanha, Valle, & Coustasse, 2016; McDonald et al., 2013). Furthermore, in many studies, FP NHs were found to be characterized by a higher number of hospitalization of residents, more quality deficiency citations, and poorer quality of care outcomes than the NFP NHs (Abrahamson et al., 2013; Grabowski, Feng, Hirth, Rahman, & Mor, 2013; Harrington, Olney, et al., 2012; Harrington et al., 2014; Hirth, Grabowski, Feng, Rahman, & Mor, 2013; Paul III et al., 2016).

Despite the availability of studies on these variables, no study was found that specifically compared adherence to staffing standards and care outcomes in NFPRB and FP NHs. Data were needed that compared outcomes in NFPRB to FP NHs. This study added to knowledge in the area of geriatric nursing care and health policy, enhanced the

evidence base for policy making, provided information for policy enforcers and other healthcare stakeholders, and provided basis for change in the process of care for the older adults living in NHs. It was proposed to help nurse leaders and educators to adequately respond to the issue of geriatric nursing education (Dellefield et al., 2015).

Purpose

The purpose of this quantitative correlational cross-sectional study was to determine and compare if there was a relationship between adhering to government staffing regulations and resident care outcomes in FP and NFPRB NHs. I examined the impact of profit maximization on adherence to staffing standards and care outcomes and determined whether the NFPRB NHs were similarly characterized with profit making at the expense of quality care. Using a correlational descriptive approach, information was collected from government public records, Certification and Survey Provider Enhanced Reporting (CASPER) and Minimum Data Set (MDS), to determine how the independent variables, adherence to staffing standards and profit maximization, were related to falls, PUs, and staffing related quality deficiencies. I provided a definition for staffing standards according to the CMS's hours per resident day recommendation while quality of care outcomes were defined in terms of total number and scope/severity of staffing related quality of care deficiency (Chen & Grabowski, 2015; Harrington, Olney, et al., 2012; Hyer et al., 2011; McDonald et al., 2013) and by NHs quality measures measured as the percentage of residents who experienced one or more falls with major injury and percentage of high-risk residents with PUs for long stay residents (CMS, 2015).

Research Questions and Hypotheses

Research Question #1: What is the relationship of profit maximization between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs?

Research hypothesis/$H1_a$: There is a relationship between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs and profit maximization.

Null hypothesis/$H1_0$: There is no relationship between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs and profit maximization.

Research Question #2: What are the differences between FP and NFPRB NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes?

Research hypothesis/$H2_a$: There is a difference between FP and NFPRB NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes.

Null hypothesis/$H2_0$: There is no difference between FP and NFPRB NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes.

Research Question #3: What are the differences in staffing related quality deficiency citations issued for failure to meet federal quality standards in FP and NFPRB NHs?

Research hypothesis/$H3_a$: There is a difference in occurrence of staffing related quality deficiency citations between FP and NFPRB NHs.

Null hypothesis/$H3_0$: There is no difference occurrence of staffing related quality deficiencies between FP and NFPRB NHs.

Theoretical Framework

This quantitative study was articulated within the context of PMT. The theory originated from microeconomics, a branch of economics that focuses on the behavior of the individuals, families, and firms as they seek to maximize their economic utility and, in the case of firms, to maximize profits while minimizing costs (Alhabeeb & Moffitti, 2013; Simon, 1959). The PMT, a component of managerial economics, constitutes one of the decision making tools in normative microeconomics (Alhabeeb & Moffitti, 2013; Simon, 1959). The theory is defined as the level at which the organization will produce quantity and quality of commodities up to the point where the marginal cost of production or improvement equals the marginal financial gain (Aaronson et al., 1994; Alhabeeb & Moffitti, 2013; O'Boyle, 2012). The main assumptions of the theory include the following propositions:

- The firm exists, in a perfectly competitive market, purposely to make profits for the owners and shareholders.
- Given the market conditions of supply and demand, the firm operates in a way that maximizes profits.
- The entrepreneur has a perfect knowledge of the market demand and supply conditions (Simon, 1972).

- The firm achieves maximum profits when marginal cost is equal to marginal revenue (Alhabeeb & Moffitti, 2013; O'Boyle, 2012).
- Pure profit is the economic reward for the services and goods produced by the firm's assumption of risks (Hawley as cited in Kirzner, 2002).
- Production would not occur without the prospect of a surplus gain as an inducement for the risks assumed, and risks will not be taken without the expectation of surplus gain (Hawley as cited in Kirzner, 2002).

Based on previous studies that have used this theory, I used the theory to explain the behavioral differences between FP and NFPRB NHs with regard to adherence to nurse staffing regulations adherence, profit making/maximization, and their effects on patient care outcomes.

The model was appropriate to the study. The purpose of this study was to examine the relationship that profit maximization had on the decision of NHs investors or owners to adhere or not to nurse staffing standards and the care outcomes that resulted from such behavior. In economics, firms are set up for the main goal of maximizing profit for the owners, which in accounting translates to operating at a level of difference between total revenue and total cost or where marginal cost is equal to marginal revenue (O'Boyle, 2012). Researchers have shown that profit making NHs are strongly inclined to choose the profit maximizing levels of quantity and quality of care while quality and safe care have been compromised when administrators are required to maximize profits within the context of compliance to staffing standards (Aaronson et al., 1994; Harrington et al., 2014; Park & Stearns, 2009).

Many FP NHs have difficulty with the realization of state imposed minimum quality standards and were found to have significantly lower staffing levels and poorer outcomes because production of quality product and profit making were considered to be antithetical to each other (Fottler, Smith, and James as cited in Aaronson et al., 1994). Given its definition, propositions, usage, and previous use, the PMT is related to the study topic and research questions and was used to examine profit maximization and NHs' investors/owners' behaviors toward nurse staffing standards and the care outcomes that resulted from these behaviors. The theory provided a theoretical lens to determine whether the quality of care occurring in FP NHs is related to factors such as adherence to staffing standards, keeping the labor cost low, neglecting the quality care services, and maximizing the profit (Harrington, Olney, et al., 2012; Park & Stearns, 2009).

Nature of the Study

The nature of this study was a correlational cross-sectional quantitative method using descriptive and inferential statistics and PMT framework to determine the relationship between profit maximization and adherence to government staffing standards (independent variables) and falls, PUs, and staffing related quality deficiencies (dependent variables) in the two types of NHs. The units of analysis, NHs, was selected using the stratified sampling method, and archival data were collected from the CMS's Nursing Home Compare (NHC). Profit measures were accessed from the CMS's Medicare Cost Report (MCR). Choosing the quantitative method strengthened the study in terms of generalizability, reproducibility, and validity (Plano Clark & Creswell, 2008).

As a strategy, the design was an easy, straightforward, and efficient one for the study implementation (see Creswell & Plano Clark, 2011).

Definitions of Terms

In this study, nurse staffing standard, nurse staffing levels, profit maximization, and care outcomes which, as stated in the research question, included falls, PUs, and staffing related deficiency citations, constituted the variables of measure. Nurse staffing standard adherence was defined as the extent to which NHs adhered or complied with the CMS recommendation for registered and licensed nurses' hours per resident day (HPRD). The federal nurse staffing requirements, as specified in the NHRA, required that NHs must have at least one RN for 8 hours a day for 7 days/week and a licensed nurse (LN), either RN/LPN/LVN, for 24 hours/day (CMS, n.d; OBRA, 1987). In terms of HPRD, this requires 0.08 and 0.30 of RNs and LNs HPRD respectively. However, the CMS has recommended that a total of 4.1 (0.75 RNs, 0.55 LVN, and 2.78 CNAs) HPRD is necessary for prevention of serious harm and jeopardy to residents (Abt. Associates, 2013). To the extent that CMS is using the recommended HPRD in its five-star quality rating of NHs (CMS, 2015), in this study, I focused on the recommended HPRD as staffing standards/levels measuring indicator. Researchers have used HPRD to determine adherence to nurse staffing standards for all the categories of nurses providing care in NHs (Bowblis & Ghatta, 2016; Chen & Grabowski, 2015; Harrington, Olney, et al., 2012; Harrington, Choiniere, et al., 2012; Matsudaira, 2014; Paek et al., 2016).

Profit maximization was measured by the NH facilities' annual gains information derived from the government record, the MCR. MCRs are financial reports comprising

itemized financial and utilization information submitted annually by all Medicare-certified facilities (Bowblis, 2015). Profit measures focused on NHs patient profit margins, the profitability of providing services to the patient, calculated from patient revenues and costs and the total operating profit margin, which excluded incomes from donations, investment, and interest payments (Bowblis, 2015; Pradhan, Weech-Maldonado, Harman, Laberge, & Hyer, 2013).

Falls, planned, or unplanned lowering of an individual's body to the floor (Kalisch, Tschannen, & Lee, 2012), are common and medically expensive incidents happening to older adults residing in NHs. The frailty and reduced physiological functionality predispose this population to increased danger of falling and, in some cases, sustenance of injuries like fractures, traumatic brain injury, poor quality of life, and/or eventual deaths (Cantalice Alves et al., 2016; Álvarez Barbosa et al., 2015; Center for Disease Control and Prevention [CDC], 2017; McArthur, Gonzalez, Roy, & Giangregorio, 2016). NH residents were found to experience worse outcomes and complication rates after falls and upon admission to the hospital when compared to their community counterparts (Botwinick et al., 2016). Falls constitute an important quality of care indicator used by the CMS for assessment and reporting of NHs quality performance. In this study, falls were measured among the long stay residents who had been residing in the NH for more than 101 days. Measurement focused on the percentage of these residents who experienced one or more falls with major injuries that included bone fracture, joint dislocations, and traumatic brain injury (Abt Associates, 2017; CMS, 2017; RTI International, 2017).

Pressure ulcers (PUs) , also known as pressure sores, bed sores, or decubitus ulcers, are injuries to the skin tissue and underlying soft tissue occurring over a bony prominence as a result of intense and/or prolonged pressure (Matsudaira, 2014; The National Pressure Ulcer Advisory Panel [NPUAP], 2016). PUs were measured in terms of the percentage of long stay high-risk residents who experienced Stages II to IV PUs during the period under study (CMS, 2017). Stage II is partial thickness loss of skin with exposed dermis, Stage III is a full thickness loss of skin involving adipose, granulation, and epibole or rolled wound edges, and Stage IV is full thickness loss of skin and tissue, and fascia, muscle, tendon, ligament, cartilage, or bone (NPUAP, 2016). PUs and falls are preventable incidences that happen to residents when there are inadequate care givers to assist the residents with repositioning, turning, or ambulation as needed (Matsudaira, 2014). Falls and PUs have been used as measures of NHs quality of care (Backhaus et al., 2016; Bowblis & Ghatta, 2016; Chen & Grabowski, 2015; Lerner, 2013; Mukamel et al., 2012).

NHs are evaluated and cited for poor performance on quality indicators due to violations of federal regulations and expected standards developed by the CMS (CMS, 2017; McDonald et al., 2013). These quality deficiencies are then ranked by scope in terms of how many residents are affected and severity, which is the extent of harm caused by the quality standards violation (CMS, 2017). Researchers have examined the relationships between staffing standards/levels and NHs quality deficiencies (Chen & Grabowski, 2015; Harrington, Olney, et al., 2012; Harrington et al., 2014; Hyer et al., 2011; Lerner, 2013). In this study, the quality deficiencies were defined by the total

number of occurrences and severity of staffing-related quality deficiency citations categories F353 and F354 (McDonald et al., 2013). F353 is issued when there is inadequate nurse staffing levels to care for every resident in a way that maximizes the well-being of the resident while F354 is issued when specific requirements for staff coverage and qualifications are not met, in this case, inadequate RN levels for 8 hours a day, 7 days a week (CMS, 2017; McDonald et al., 2013).

FP NHs are being operated to make and maximize profits and are presumed to set output, input, quality, and residents case mix in order to achieve the goal of profit maximization (Grabowski et al., 2013; Harrington, Carrillo, & Garfield, 2015; Harrington et al., 2014; Harrington, Olney, et al., 2012). These NHs are publicly-owned by investors who have shares in the business and are expected to benefit from its profits and investments reward (Harrington et al., 2014; Hirth et al., 2013; Weech-Maldonado et al., 2012), thereby adding the pressure of maximizing profits to the operators of the facilities.

The NFP NHs are nongovernmentally owned by religious, community groups, or agencies and operated as nonprofit organizations (Ronald, McGregor, Harrington, Pollock, & Lexchin, 2016). They are precluded from an assignment of property rights; they do not have defined shareholders, are not subject to the pressure of distributing profits (Grabowski et al., 2013; Harrington, Olney, et al., 2012; Hirth et al., 2013; Weech-Maldonado et al., 2012), and are expected to use the profit derived from operation for the benefit of the clients (Ronald et al., 2016). This category of NHs, especially the religious-based NHs, exist to provide value based services (Paul III et al., 2016). Jacobs and Polito (2012) wrote that the performance of the NFPRB NHs are measured by the

outcomes in how well they provide services and take care and meet the immediate needs of customers. The two NH ownership types were derived from the CMS's NHC report data.

Assumptions

There were various assumptions underlying this study. It was assumed that high quality of care was desirable for the NHs residents and that there would be a healing environment, clinical knowledge, caring, communication, and patient-centeredness for the occurrence of care outcomes. Assumptions were also made concerning the profit maximization principles positing that organizations exist for the main purpose of making profits and operating in a way that maximizes profit for the gainful benefit of the owners and the shareholders rather than maximizing social capital (Alhabeeb & Moffitti, 2013; O' Boyle, 2012; Simon, 1959). In addition, I assumed that the information collected from the public record would be objective and complete.

Scope and Delimitations

In this study, I used four variables of quality of care outcome measures that included registered and licensed nurse staffing levels, falls, PUs, and quality deficiencies as the dependent variables while profit maximization and nurse staffing standards constituted the independent variables. The study was limited by its scope and focus on the FP and NFPRB Medicare certified nonhospital-based NHs and, therefore, was lacking in generalization and applicability of findings to other NHs. The nursing organization and outcomes model has also been used to study the variables of interest and could have been used for this study (see Dellefield et al., 2015). Comprising structure, process, and

outcomes measures, Donabedian (2005) proposed that organizational structure affects processes which in turn affect outcomes in medical care. The model could have been appropriate for the study given that nursing structural variable like staffing, skill mix, or professional environment are directly or indirectly associated to patient (and staff) outcomes (Rochefort, 2006).

Limitations

The methodology and design limitations that affected the study interpretation included the use of a cross-sectional approach, which was limiting to the study compared to a longitudinal study. Although Lin (2014) wrote that the source of data, CASPER, was considered to be reliable and accurate, the information was self-reported by NH staff and could have undermined the objectiveness of the study outcomes. The stratified sampling strategy could have been affected by selection bias.

The un-obstructive and nonreactive process involved in using the archival data made the study strong for external validity and reliability issues. Threats to construct and internal validity (Cuffaro, 2011) were addressed by using the quality measures definitions provided by the CMS while the planned stratified sampling strategy was another measure to strengthen the study validity. However, the convenient large number of NHs analyzed for the study provided adequate statistical power, alpha, and effect size that effectively detected relationships or differences between the variables of measurements (Houser, 2015).

Significance

Government agencies, healthcare organizations and practitioners, NHs residents and their families, residents' advocates, insurers, and the public continue to have concerns about the quality of care/life and safety associated with nurse staffing in NHs. The need for this comparative study on nurse staffing standards in NHs was related to its significance to nursing profession and/or practice, public health policy process, and the potential positive effects on the lives of the older adult NHs residents. The findings of this comparative study not only recommend for policy change but lead to a new discussion on a moral basis for NHs staffing and public health policy change. It will contribute to knowledge in the field of geriatric nursing and provide information for nurse educators and leaders on the need to improve curriculum on care of older adults, prepare students for careers in geriatric nursing, and make the field attractive to nursing staff (Dellefield et al., 2015). The study is unique to the field of nurse staffing standards/levels scholarly activity because I focused on a topic that has rarely been studiedand used theoretical foundations that have been rarely employed for studying the phenomenon of interest.

The study is important and will contribute to positive social change in diverse ways. The study results can serve as an advocacy instrument for the elderly residents who constitute a vulnerable and voiceless population. Morally speaking, implementing the study is the right thing to do for the NH residents. It will equally contribute to the enhancement of the evidence base for public policy making by providing information for policy makers and enforcers, healthcare stakeholders, and basis for change in the process

of care for NH residents. In addition, implementation of study results could positively impact the cost of healthcare (Lin 2014) when adverse events and deficiencies are reduced as staffing is increased to the required standard levels. More importantly, older adults may experience better care and quality of life. Management quality scores will also improve as evidenced by lower deficiency scores, and this will positively affect marketability and attract residents to the NHs (Edgman-Levitan, 2014; Hyer et al., 2011).

Summary

The issue of adequate nurse staffing hours per resident day in NHs continues to be a growing concern in health care systems. In 1987, the NHRA specified nurse staffing requirements and the CMS later recommended higher HPRD for NHs, but nonadherence and poor staffing levels continue to characterize NH care operations. The population of vulnerable older adults in NHs continue to suffer from less than optimal quality of care outcomes, worse in the FP than the NFPRB NHs. The comparative study on adherence to nurse staffing standards and its impact on the occurrences of PUs, falls, and staffing related quality deficiencies in the FP and the NFPRB NHs is a scholarly activity that needed to be studied for its potential contribution to knowledge, nursing education and practice, policy making, and older adult residents' quality of life.

In this study, I used PMT and tested the hypotheses that focused on the effect of profit maximization on the relationship between adherence to nurse staffing standards and quality of care outcomes, defined in terms of falls, PUs, and staffing related quality deficiencies. I used a correlational cross-sectional quantitative methodology and collected secondary information on staffing data and quality of care measures from the CMS's

NHC and MDS 3.0. The information was analyzed using descriptive and inferential statistics. While the scope of the study included six constructs of measurement in the two categories of NHs, the use of a point in time, cross-sectional approach, and staff self-reported sources of data, CASPER and MCR, could have constituted some significant limitations to the study outcomes.

In the next chapter, I discuss the introduction to the study with a restatement of the problem and concise synopsis of the literature that established the problem relevance. I list the key searched databases and terms used as well as the scope of the literature reviewed. In addition, the theoretical foundation, comprehensive literature related to variables of study and the research questions are enumerated in detail.

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Chapter 2: Literature Review

Many of the 1.4 million frail and vulnerable older adults who reside and/or receive care services by health care providers in the nation's more than 15,600 diverse types of NHs (CMS, 2016) continue to suffer from poor quality care outcomes. Studies have shown that a quality and safe care outcome lagged behind the expected quality care indicators (Castle & Fergusson, 2010; Shin, 2013). The less than optimal care outcomes and lack of safety were related to low nursing staffing hours per resident day (Lee, Blegen, & Harrington, 2014; Lin, 2014). Despite the government's regulations and standards guiding staffing of nurses in NHs, researchers have identified lack of adherence to staffing regulations, inadequate levels of nurses, and focus on profit making as having a causal relationship with the prevalent poor care outcomes (Castle & Fergusson, 2010; Harrington, Olney, et al., 2012; Lee et al., 2014; Lin, 2014; Shin, 2013; Shin et al., 2014; Zhang et al., 2013). Most NHs that are FP were found to be in violation of staffing standards/regulations and had the most serious problems with resident care outcomes and high staffing related quality deficiencies (Grabowski et al., 2013; Harrington, Olney, et al., 2012; Lin, 2014; Park & Stearns, 2009).

The purpose of this quantitative study was to determine and compare if there was a relationship between adhering to government staffing regulations and residents care outcomes in FP and NFPRB NHs. In this study, I examined the impact of profit maximization on adherence to staffing standards and care outcomes. I focused on determining whether the NFPRB NHs were similarly characterized with profit making at

the expense of quality care and the relationship between adherence to staffing standards and falls, PUs, and staffing related quality deficiencies.

In this chapter, I review the scope of the vast literature related to the impact of adherence to staffing standards in NHs, profit maximization/making, and resident care outcomes. I describe the key search terms, accessed databases, years of publication, and types of literature sourced. In addition, the theoretical framework and its relevance to the study, major study constructs, methodology, and studies related to the research questions are reviewed, discussed, and synthesized.

Literature Search Strategy

I used the following key search terms for the literature review: *registered nurse staffing, nurse staffing, staffing levels, nursing homes, quality of care/life, staffing standards, staffing regulations, care outcomes, resident health outcomes, quality measures, quality deficiencies, staffing related deficiencies, falls, pressure ulcers, profit making,* and *profit maximization*. Other terms used were *long term care, personnel staffing, personnel scheduling, scheduling standards, nursing manpower, nurse-patient ratio, quality of health care, housing for the elderly, for profit, not for profit, nonprofit, nursing homes economics, nursing homes administration, faith-based, religious,* and *religion*. Databases such as CINAHL Plus, Business Source Complete, Medline Complete, Academic Search Complete, ProQuest Dissertation, ProQuest Nursing, Allied Health Source, and Google Scholar were used as sources for information on the topic. Information was also retrieved from Sage Encyclopedia, Google, textbooks, CMS, and American Nurses Association website. In most cases, dates of publication were limited

from 2011 to 2016. Other limiters used for the search included English language and peer-reviewed journals.

Theoretical Foundation

In order to determine and compare the relationship between adhering to government staffing standards/levels and residents care outcomes in FP and NFPRB NHs, this quantitative study was articulated within the context of PMT. The PMT, a component of managerial economics, originated from economics and constitutes one of the decision making tools in normative microeconomics (Alhabeeb & Moffitti, 2013; Simon, 1959). Microeconomics is a branch of economics that focuses on the behavior of the individuals, families, and firms as they seek to maximize their economic utility and, in the case of firms, to maximize profits while minimizing costs (Alhabeeb & Moffitti, 2013; Simon, 1959).

Profit economists proposed that the making of profit over and above all costs is an economic reward for the entrepreneur's assumption of business's risks, engagement in the uncertainties associated with business, and investing resources (Friedman, 1962; Hawley as cited in Kirzner, 2002). Since the business creates the burden of providing the special service caused by the need of buyers, Hawley (as cited in Kirzner, 2002) argued that the business is entitled to the market rewards or profit as an inducement for rendering the services and for the continuation of the product. It is important to note, from Hawley's perspective, that for the business to make profits and for the consumers to get their sought for products and services, the consumers will be forced to pay high prices to permit profit making.

Maximization of profit is considered to be the central goal for businesses operating in a competitive market environment, without which the businesses would neither thrive nor improve (Alhabeeb & Moffitti, 2013; O'Boyle, 2012; Simon, 1959). Profit, generally speaking, is the difference between total cost of producing goods and services and the total revenue (Alhabeeb & Moffitti, 2013; O'Boyle, 2012; Simon, 1959). Profit maximization is the level at which the firm produces quantity and quality of commodities up to the point where the marginal cost of production equals the marginal revenue (Alhabeeb & Moffitti, 2013; O'Boyle, 2012; Simon, 1959). Maximization is the pure profits or maximum residual share the firm makes (Simon, 1959). This is represented as follows:

Profit (Pr) = Total Revenue (TR)-Total Cost (TC)

Profit maximization (Pm) = Marginal Revenue (MR) = Marginal Cost (MC)

The propositions for this theory include that the business exists to make and maximize profits for the owners and shareholders in a competitive market, given the market conditions of supply and demand. The entrepreneur has a perfect knowledge of the market conditions and maximizes profits when MC is equal to MR (Alhabeeb & Moffitti, 2013; O'Boyle, 2012; Simon, 1972). Businesses are induced to take risks for production of goods and services by the expectation of a surplus gain and economic rewards (Hawley as cited in Kirzner, 2002).

Researchers have used profit maximization, either as a theory/model or as a conceptual guide, to study staffing standards, staffing levels, and quality of care in NHs

and/or long-term care facilities. Studies on behavioral differences between FP and NFP NHs, using profit maximization assumptions, showed that profitability goal and the requirement to minimize costs were the main foci for FP NHs (Aaronson et al., 1994; Harrington et al., 2014; Hsu et al., 2016; Park & Stearns, 2009). These goals were related to shifting of production costs to the higher self-pay private residents, substitution of cheaper labor, fewer hours of direct resident care, and inadequate staffing levels by profit making NHs (Aaronson et al., 1994; Harrington et al., 2014; Hsu et al., 2016; Park & Stearns, 2009). In this study, I examined the impact of profit maximization on adherence to staffing levels in the two types of NHs.

Park and Stearns (2009) used the profit maximizing model as a framework for examining the effects of staffing standards on NH staffing levels and residents' quality of care. They opined that profit maximizing "nursing homes will produce quantity and quality of care up to the point where the marginal cost of improvement equals the marginal financial gain from doing so" (Park & Stearns, 2009, p. 63). Given the strong incentives to choose the quantity and quality of care production that would maximize profits, profit making NHs tend to lower or not increase the staffing standards/levels and lower the quality of outcomes (Park & Stearns, 2009; Harrington et al., 2014). Hence, Park and Stearns (2009) found significant increases in RNs, nurse aides, and total staff hours in NFP NHs' response to staffing standards compared to FP NHs.

The profit maximization model was equally employed to examine the effects of ownership on quality of postacute care, residents' hospitalization, quality deficiencies citations, and other care outcomes (Aaronson et al., 1994; Grabowski et al., 2013;

Harrington et al., 2014; Hirth et al., 2014; Park & Stearns, 2009). Pressure for profitability and the obligation for distribution of accounting profits to owners and shareholders were pertinent factors for setting the output, quality, inputs, and patient mix at levels to achieve profits by profit making NHs (Grabowski et al., 2013; Harrington et al., 2014; Hirth et al., 2014), which culminated into poor care outcomes.

The NFP NHs, on the other hand, do not have similar obligation; rather, they enjoy certain taxes incentive to maximize objectives other than profit maximization (Grabowski et al., 2013; Hirth et al., 2014). O'Neill, Harrington, Kitchener, and Saliba (2003) used the concept of profit maximization to elucidate the trade-off between profit making and quality of care. In their explanation, they stated that since staffing is the largest elements of NHs cost of production, it becomes necessary to decrease staff time and wages in order to increase profits. Given that staffing constitutes the significant factor for producing quality of care, increasing the profits would adversely impact on quality. Profits located within certain threshold were negatively related with total and serious deficiencies in FP NHs (O'Neill et al., 2003). Figure 1 shows the illustration and interrelatedness of profit maximization and variables of the study.

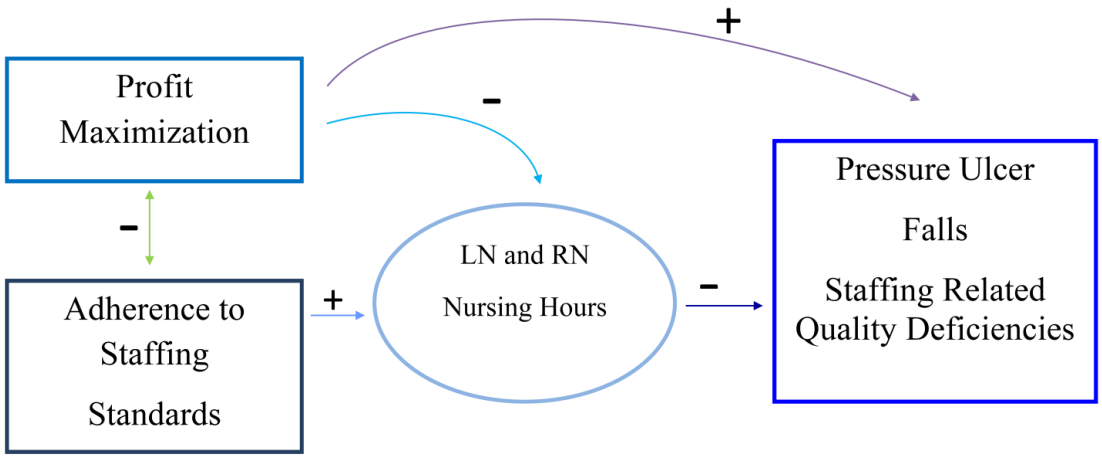

Figure 1. Model: Illustration of the theoretical foundation and variables of study.

The PMT is an appropriately relevant theoretical foundation for this study. The model was employed in this study, similar to what has been previously done by researchers, to form the basis for examining the behavioral differences between the FP and NFPRB NHs with regards to adherence to staffing standards. It constituted the theoretical lens with which I examined the factors motivating the decision for compliance to staffing standards, labor costs of production, and quality of outcomes (Aaronson et al., 1994; Grabowski et al., 2013; Harrington et al., 2014; Hirth et al., 2014) among the two categories of NHs. The study research questions and hypotheses were built with a focus on the model. Hence, the PMT was deductively tested to determine whether the quality of care occurring in the FP NHs was related to factors such as adherence to staffing regulation, keeping the labor cost low, neglecting provision of quality care, and maximizing business profits (Harrington, Olney, et al., 2012).

Literature Review Related to Research Methodologies and Designs

Qualitative Method

The qualitative method of inquiry is an approach to engaging in scholarly activities with a goal of exploring facts, understanding issues, generating theories/framework of explanation, and making sense of people's life and behavior according to their beliefs, custom, and values (Creswell, 2009). The method is used when little is known about a problem area to create an in-depth understanding of an issue from the perspectives of the participants; it tends to involve small samples or case studies (Creswell, 2009). The process involves the researcher as the key information gathering instrument and interpreter of data, a collection of multiple types of data at the participants' setting, inductive analysis of data, flexible report writing, and emerging questions and procedures (Creswell, 2009). The phenomenon of interest in this study had been previously studied and did not necessitate an exploration of facts. Therefore, the use of a qualitative method was inappropriate for the objective of the study.

Quantitative Method

The quantitative method is a research approach that is based on positivism and a postpositivism philosophical worldview and is used to test and verify theories by examining the deterministic relationship between two or more variables or to compare two or more study groups (Creswell, 2009). The researcher using quantitative design collects data, without being involved, using questionnaires, interviews, structured observation, or record reviews with close-ended questions. It is a deductive testing of theories that involves an empirical observation and numerical measurement of data on an

instrument, a descriptive method and use of statistical tests, and an objective interpretation of results (Creswell, 2009). The quantitative method was considered appropriate for this study because it is used to test theories and determine the relationship between variables by using statistical tests. Also, many of the studies reviewed on the variables of interest and research questions used a quantitative approach, as shown below.

Mixed Methods

A mixed method is the mixture of quantitative and qualitative strategies of inquiry and their related philosophical worldviews. Using pragmatism as a philosophical orientation, mixed methods combine quantitative and qualitative approaches for collection and analysis of data, integration of findings, and drawing of inferences with a purpose of providing a better understanding of the research problem (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). The process involves multiple research designs and ways of seeing, hearing, interpreting, and making sense of the social world using narrative and numerical information and analysis that integrates both statistical and thematic techniques (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). According to Trend (1979), the combination of the two methods provides a variety of data, allows different viewpoints, and supports finding a deeper answer to the research questions.

Researchers have used quantitative, qualitative, and mixed methods to examine the adherence to nurse staffing standards, the relationship between nurse standards and actual staffing levels, and the impacts of nursing standards/levels on NHs residents care outcomes. Studies on these variables have mostly used a quantitative method with a focus

on cross-sectional correlational design (Backhaus et al., 2017; Cho, Chin, Kim, & Hong, 2015; Dellefield et al., 2015; Harrington, Olney, et al., 2012; Kalisch et al., 2012; Lee et al., 2014; Min, Park, & Scott, 2016; Paek et al., 2016; Shin, 2013; Shin & Hyun, 2015; Shin et al., 2014; Staggs & Dunton, 2014). Few quantitative longitudinal studies included the works by Bowblis (2011), He, Staggs, Berquist-Beringer, and Dunton (2016), McDonald, Wagner, and Castle (2013), Stagg, Knight, and Dunton, (2012), Whitehead, Parsons, and Dixon (2015), and Wagner, McDonald, and Castle (2013). Chen and Grabowski (2015) and Bowblis and Ghattas (2016) employed a quasi-experimental quantitative approach in their studies on topics related to the study. The qualitative method has been rarely used as a sole approach in determining the relationship between the variables of interest in this study. Rather, two recent studies used mixed methods to examine the relationship between staffing standards/levels and NHs resident care outcomes (Backhaus et al., 2016; Harrington et al., 2014), and Towsley et al. (2011) used mixed methods in their study on staffing levels in rural NHs.

Literature Review Related to Key Variables and Concepts

Nurse Staffing Standards

The 1987 federal government's Omnibus Budget Reconciliation Act (OBRA) addressed the minimum nurse staffing standards for NHs care services operations in the NHRA. The law specified that NHs must have at least one RN for eight hours a day for seven days/week and a LN, either RN/LPN/LVN, for 24 hours/day (CMS, n.d; OBRA, 1987). The law stipulated that RNs must assess the residents, and, in collaboration with other licensed nurses, LPN/LVN, implement care plans, treatment, and evaluation of

residents' health outcomes while the CNAs/NAs provide activities of daily living care for the residents under the supervision of LNs (Bowblis, 2011; CMS, n.d; Chen & Grabowski, 2015; Matsudaira, 2014). NHs are, additionally, required to provide services that maintain the dignity, wellbeing, and quality of life for the older adult residents using sufficient nurse staffing levels (Bowblis & Ghattas, 2016; CMS, 2015). The law, however, did not specify what nurse staffing levels are sufficient to be on each shift.

The CMS sets minimum staffing standards, among other quality and safety standards, and delegates monitoring principles to individual state that exercises the authority to interpret and apply the standards (Mukamel et al., 2012). In addition to the federal NHs nurse staffing regulation, diverse states (through different interpretation of sufficient staffing) have their individual minimum staffing standards, either at the federal or higher levels, which create variations in standards across the nation. While the federal law regulates staffing standards by HPRD, the states regulate either by HPRD, number of staff by shift, staff-to-resident ratio, or minimum staffing hours (Paek et al., 2016).

There have been studies on nurse staffing standards in NHs that were differentiated by scope of study with a focus on national or state(s) samples, types of nursing staff, and methodology and design. Although some researchers used ownership types as covariates (Bowblis, 2011; Bowblis, 2015; Bowblis & Ghattas, 2016; Chen & Grabowski, 2015; Mukamel et al., 2012; Paek et al., 2016; Park & Stearns, 2009) and Harrington et al. (2014) studied the effects of regulation on a large FP NH chain, no study was found with an explicit focus on comparing minimum nurse staffing standards in FP and NFPRB NHs. On a nation-wide scope, Mukamel et al. (2012) studied the impact of

states' additional standards and harshness of the sanction process on seven quality measures of 16, 352 Medicare and Medicaid certified NHs and their residents. Using primary and secondary data between 2005-2006, instrumental variables analysis techniques, Harrington Regulation Stringency Index, and two-stage least-squares models, the authors examined the correlation between stringent standards and quality measures that included the three types of nursing staff, CNAs, LPNs, and RNs, one process measure, and three outcome measures. Despite the coverage of the study, the authors did not compare possible differences of outcomes in the FP versus NFPRB NHs.

Another national study on nurse staffing standards was implemented to measure the impact of the states and/or federal regulations on actual staffing levels at the level that each facility must retain by its state's standards (Paek et al., 2016). Paek et al. (2016) collected information from the States' NHs Staffing Standards, Average State Medicaid Reimbursement Rates, Online Survey Certification and Reporting System (OSCAR), and Area Resource File (ARF). Employing a resource dependence theory and cross-sectional quantitative method, the authors used the hierarchical linear modeling with "Proc Mixed" of SAS program and descriptive statistics for data analysis. In addition to the focus on staffing standards and levels of RNs, LNs, NAs, and total nurse staffing (TN), the authors examined the relationship between staffing standards and covariates that included ownership types such as chained, FP, NFP, hospital based, and NFP government owned NHs. The analysis did not reveal differences in compliance.

Park and Stearns (2009) also conducted a nation-wide study on the effects of states' minimum staffing standards on staffing levels and quality of care in 15,217 NHs.

Profit maximization was utilized to explain whether NHs adoption of standards depended on the marginal cost of improvement in relation to marginal financial gain of compliance. Similar to other researchers on the topic, Park and Stearns used secondary sources of information that included Online Survey, Certification and Reporting (OSCAR), Brown University Survey of State Policies, State Data Book Area Resource File, and U.S Census Bureau. The three types of nurses and TN staff, five quality care outcome/process measures, and total number of deficiencies were examined against staffing standards in FP, nonprofit, government, and chain ownership NHs using difference-in-difference (DID) design with facility fixed effects and descriptive statistics. The behavior of NFPRB NHs in response to minimum staffing standards was not addressed in the study.

Bowblis (2011) examined the impacts of minimum direct care staffing standards on nurse staffing levels, skills mix, and quality of care. OSCAR data and supplemental information such as states' Medicaid reimbursement rates and weekly NHs worker wages from 1998-2004 were subjected to linear reduced form models of analysis. The quantitative secondary data study added a reliance on Medicaid factor as a basis for adherence or otherwise among the facilities. Staffing skills mix was constructed differently using RN and LPN as percentages of total nursing staff.

Using a quasi-experimental quantitative design, Chen and Grabowski (2015) studied the impact of minimum staffing standards on all types of nursing staff, indirect care givers, and quality of care in Ohio and California. Ten states that did not have existing minimum regulation during the study period were used as the study control states for comparison of compliance with the states of Ohio and California. The authors used

the economic model of perfect competitive market for theoretical explanation, five quality outcome/process measures, total count of deficiency citations, and all staffing types HPRD as the dependent variables. While using information mainly collected from OSCAR, the authors employed the DID, regression models, and panel data methods of analysis.

Bowblis and Ghattas (2016) focused their study on the states of Vermont and New Mexico that had already implemented 3.0 and 2.5 HPRD in 2001 and 2000 respectively as the new minimum staffing standards for the total number of nursing staff levels. In addition to determining the effects of standards on the staffing levels of RNs, LPNs, CNAs, and TN staff, Bowblis and Gahttas went further to examine its effects on contract nursing staff and the decision of the NHs operators to stop operating NHs. The data were analyzed using OSCAR information and NHs were classified into low staffed, high staffed, and control facilities that were already at the new standards level. They also used a similar quasi-experimental quantitative approach with DID and regression models of analysis.

Harrington et al. (2014) and Matsudaira (2014) studied the California NHs compliance with the new staffing standards. Harrington et al. (2014) used a mixed methods approach that assigned more weight to a qualitative historical single case study as the primary method to examine the impacts of standards (and litigation) on a large FP NH chain. The authors collected and compared information from multiple sources during two-period of times (2003-2009 and 2010-2011), and analyzed and triangulated findings for confirmation and reliability of outcomes. Matsudaira (2014) examined the effects of

the California state's staffing standards on actual levels of geriatric nurse practitioners, RNs, LVNs, NAs, and on the total number of nursing hours. Matsudaira analyzed the administrative data on staffing and facility characteristics data from California Office for Statewide Health Planning and Development and matched them with data from OSCAR. NHs were grouped into and compared according to those that were operating below the new staffing standards of 3.2 HPRD and those that were already in compliance prior to the new standards.

Staffing standards and their impacts on staffing levels were also studied for comparison across six countries- United States, Canada, Norway, England, Germany, and Sweden by Harrington, Choiniere, et al. (2012). The authors gathered data on NHs staffing standards from each country's government websites and utilized quantitative descriptive statistics methods of analysis. However, the study was limited by availability and standardization of data across these countries, leading to some subjectivity. The results of these studies are enumerated in the section on the relationship between staffing standards and staffing levels below.

Nurse Staffing Levels

Nurse staffing levels are critical to the process and outcomes of care services in NH facilities. They have been found to be closely related to diverse quality of care measures (Gichungeh & Kim, 2015; Lee et al., 2015; McDonald et al., 2013; Shin, 2013). The three major categories of nurses or direct patient caregivers in the United States include, according to their levels of educational preparation, skills and knowledge acquired by training, RNs, LPNs/LVNs, CNAs/NAs (Harrington, Choiniere, et al., 2012).

The RNs are nursing personnel with the highest nursing education, at both baccalaureate and associate degrees levels, and have the knowledge and skills to conduct patients' assessment, draw conclusions about nursing diagnoses, perform appropriate and individualized care plans and interventions, and provide continuous monitoring of response to care through further assessment (American Nurses Association [ANA], n.d; Bowblis & Gahattas, 2016). The LPNs and LVNs have lesser educational attainment and training than RNs, their responsibilities include working together with RNs to implement, supervise, and evaluate care. The CNAs/NAs are educated at high school level and must receive 75 to 80 hour skills/competency training without additional educational requirements (Bowblis, 2015; Bowblis & Ghattas, 2016; Castle & Anderson, 2011; Gichungeh & Kim, 2015). The CNAs, working under the direction of a LN, assist the residents to perform activities of daily living such as eating, bathing, grooming, dressing, transferring, changing of bedding, toileting, and facilitates daily living activities (CMS, n.d; Gichungeh & Kim, 2015).

In accordance to the NHRA staffing law of 1987, which is still the current federal law on nurse staffing in NHs, NHs must have RN director of nursing, one RN on duty for at least eight hours a day, seven days a week, and either an RN or LPN/LVN for 24 hours a day (CMS, n.d; McDonald et al., 2013). In terms of HPRD, this requires 0.08 and 0.30 of RNs and LNs hours respectively. However, the CMS has recommended that a total of 4.1 (0.75 RNs, 0.55 LVN, & 2.78 CNAs) HPRD would help prevent serious harm and jeopardy to residents (Abt. Associates, 2013). In addition, the CMS is using a national average TN staff of 4.03 and RNs of 0.75 HPRD to calculate staffing quality in its Five-

Star Quality Rating system (CMS, 2015). It is important to note that, although the federal law requires the provision of staff enough to adequately take care of the residents, there is no current federal standard for the best NH staffing levels (CMS, n.d; Harrington et al., 2015).

Researchers on nurse staffing levels in NHs have concentrated on different nurse staffing levels which include focusing on one or two of the three nurse staffing levels (Dellefield et al., 2015; Lee et al., 2013; Lin, 2014). They have used the actual direct care providers' hours (Whitehead et al., 2015), the TN staffing skill mix of the three staffing levels, and/or in combination with the different staffing levels (Castle & Anderson, 2011; McDonald et al., 2013; Shin, 2013; Shin et al., 2014; Towsley et al., 2013). While Wagner et al., (2013) focused on the three different types of nurse staffing, Backhaus et al. (2016) studied all staff HPRD. The outcomes of these studies are discussed in the following section.

The Relationship Between Nurse Staffing Standards and Staffing Levels

The researchers that examined the influence of staffing standards, using the federal and/or states requirements, on the actual staffing levels nationally, included Bowblis (2011), Bowblis (2015), Bowblis and Ghattas (2016), Harrington et al. (2015), Mukamel et al. (2012), Paek et al. (2016), Park and Stearn (2009), and Zhang et al. (2013). Few researchers studied the effects of staffing standards on staffing levels, with a focus on the states, either by comparing how NHs in different states or within a state responded to the staffing requirements (Bowblis & Ghattas, 2016; Chen & Grabowski, 2015; Harrington et al., 2014; Matsudaira, 2014). Two internationally-focused studies

compared the outcomes of NHs staffing standards on staffing levels in six industrialized countries (Harrington, Choiniere, et al., 2012) and between the United States and Korea (Lee et al., 2015). The results of these studies were reported in terms of TN HPRD, LN HPRD, RN HPRD, CNA HPRD, LPN/LVN HPRD, professional skill-mix, and nurse staffing substitution.

Many of these studies showed positive association between staffing standards and staffing levels for RN, LN, and TN categories of nurses (Bowblis, 2011; Bowblis & Gahttas, 2016; Chen & Grabowski, 2015; Harrington, Choiniere, et al., 2012; Harrington et al., 2015; Lee et al., 2015; Matsudaira, 2014; Paek et al., 2016; Park & Stearns, 2009; Zhang et al., 2013). States with higher or stronger staffing standards have higher actual staffing levels than states with lower staffing standards (Harrington, Choiniere, et al., 2012). According to Paek et al. (2016), NHs in states with stronger RN, LN, and TN nurse requirements responded with higher staffing levels for these categories and higher acuity index was also significantly related to higher nurse staffing levels for all the three levels. Although Paek et al. found that staffing levels were not increased as much as required by the states, NHs responded actively to LN and TN requirements, the former being higher than the latter.

In his study on state regulations, measured in terms of minimum direct care staffing requirements (MDCS), Bowblis (2011) found that higher MDCS requirements increased the TN staffing levels in all NHs and increased use of RNs in staffing skill-mix. Bowblis (2011) and Zhang et al. (2013) observed increases in TN, RN, LN, and RN skill-mix in Medicaid concentrated NHs. In contrast, Paek et al. (2016) stated, in their study,

that Medicare concentrated NHs were positively related to the staffing requirements for all the three categories of nurses. In another recent study, Bowblis (2015) posited that more stringent staffing standards had positive effects on all nursing staffing levels, albeit, to the detriment of non-nursing staff.

A persistent, more than three years, positive impact of 5% increase in TN direct care HPRD was found with the implementation of staffing standards in Ohio and California (Chen & Grabowski, 2015). In the post-regulation periods, nationally and, in Ohio, California, New Mexico, and Vermont, NHs that had initial low-staff levels responded positively and increased their TN HPRD by hiring more nurses for all the three types of nursing levels (Bowblis & Ghattas, 2016; Chen & Grabowski, 2015; Matsudaira, 2014; Park & Stearns, 2009). In addition, a nation-wide as well as California studies showed a higher RN, TN staffing levels, and increase employment of LNs in NHs that were initially low-staffed or out of staffing requirement compliance. Compared to the CMS's recommended HPRD, slight increases were observed in the levels of TN and LN, from 3.9 to 4.0 and 0.7 to 0.8 HPRD between 2009-2014 (Harrington et al., 2015) while TN median HPRD, RN median HPRD, and LN median HPRD increased from 3.6 to 3.85, 0.51 to 0.63, and 1.29 to 1.43 from 2008 to 2011 (Lee et al., 2015). These increases, though were below the CMS's recommended RN, LN, and TN HPRD, were in the positive direction towards the minimum staffing standards. In prior study by Harrington et al. (2012), 23 states had higher LN HPRD while 20 states had higher RN HPRD than the federal minimum staffing standard requirements.

The federal and/or state minimum staffing standards have not yielded the expected outcome for the required RN, RN skill-mix, LN, and TN nursing staffing levels in many NHs across the nation. Within many of the studies referenced above and other studies, there were results that indicated negative association between NHs staffing standards and actual staffing levels for one or more of these nurse types (Bowblis, 2011; Bowblis & Ghattas, 2016; Chen & Grabowski, 2015; Harrington et al., 2014; Harrington et al., 2015; Paek et al., 2016; Matsudaira, 2014; Mukamel et al., 2012; Zhang et al., 2013;). For instance, NHs that had higher staffing hours or levels that are close to the required standards prior to the introduction of staffing standards were found to either reduce or not change the RN, LN, and TN staffing levels (Bowblis, 2011; Bowblis & Ghattas, 2016;Chen & Grabowski, 2015; Matsudaira, 2014; Park & Stearns, 2009).

The staffing standards had no impact on all the staffing levels for NHs that were located in some least competitive markets environment (Chen & Grabowski, 2015) while no change in RN proportion of LN skill-mix and decreased LN staffing levels were found in response to MDCS (Bowblis, 2011). Negative responses for LN and TN staffing levels in chained NHs and with all the three categories of nurses in increased Medicaid residents NHs were some of the outcomes of strong staffing requirement (Paek et al., 2016). Mukamel et al. (2012) equally wrote that there was an 8.7 percentage decrease of RN national means in response to stringent staffing standards during the years 2005 to 2006. Researchers that examined the gaps between nurse staffing levels and resident needs found some differences in the trends of nurse staffing levels by the different category of payers-Medicare, Medicaid, and private (Zhang et al., 2013). The authors concluded that,

from 1997-2009, RN and RN skill-mix decreased across all NHs while all types of nurse staffing levels declined in the Medicare concentrated NHs; RN HPRD and RN skill-mix declined the most and RN skill-mix was the only type of staffing that decreased in the private-payer concentrated NHs.

Harrington et al. (2015) wrote, in their report on NHs, staffing, residents and deficiencies from 2009-2014, that actual staffing levels were lower than the CMS's recommended levels for TN. Although the comparative study of the staffing standards and staffing levels in the United States and Korea showed some increases in the staffing levels, the RN and TN HPRD were below the recommended hours for the years 2008 through 2011 (Lee et al., 2015). Furthermore, inverse relationship between staffing standards and actual staffing levels was found to be characteristic of FP and chain FP NHs for RN, LN, and TN HPRD (Harrington et al., 2014; Paek et al., 2016; Park & Stearns, 2009). Nation-wide, the FP NHs that were operating at a higher staffing levels prior to staffing standards decreased their TN HPRD between 1998-2001 (Park & Stearns, 2009) while 22 facilities of a large FP NH chain in California had TN HPRD lower than the state requirements for a period of nine years, from 2003-2011 (Harrington et al., 2014).

Many of the studies reviewed showed statistically significant findings between minimum staffing standards and LPN or CNA HPRD, which indicated substitution of lower-skilled nurse staffing levels for professional higher-skilled RN staffing and RN skill-mix; an attempt by the NHs to fulfill the quantity and not the quality of LN and TN HPRD requirements (Bowblis, 2011; Bowblis and Ghattas, 2016; Chen & Grabowski,

2015; Harrington et al., 2012; Harrington et al., 2015; Lee et al., 2015; Matsudaira, 2014; Mukamel, 2012; Park & Stearns, 2009; Zhang et al., 2013). Considered as unintended effects of adherence to staffing standards in Ohio and California, Chen and Grabowski (2015) found fewer professionals and higher NAs proportions of nurse staffing skill-mix resulting from increase in LPN and CNA mean HPRD. In their study, seventy-one percent of the increase found in TN HPRD came from CNA while the rest came from LPN.

Many NHs reduced the RN hours, hired increase number of CNA and/or LPN, thereby moving the skill-mix of TN towards the use of more CNA and, among the LNs, the use of LPN/LVN (Bowblis, 2011; Bowblis and Ghattas, 2016; Matsudaira, 2014; Park & Stearns, 2009). For instance, about 2/3 (Park and Stearns, 2009) or higher percentage (Harrington et al., 2015) of the TN hours was due to increase in non-licensed staff. Mukamel et al. (2012) found an 8.7 percent decrease RN national mean hours when there were increases of 8.7 and 5.4 percent increases in LPN and CNA national mean hours respectively. Matsudaira (2014) showed a more pronounced nurse staffing substitution when he concluded that there was a reduction in RN worked hours for all study facilities, usage of more LVN to replace RNs in facilities with higher initial staffing levels, 35 percent or more increase CNA employment, and an increase of 23 percent for every one hour below the 3.2 TN HPRD state in NHs with the lowest initial staffing levels.

The increased median LPN HPRD of 0.78 from 2008 to 0.80 in 2011 were above the expected hours of 0.65 and 0.68 during these years while the increased median RN

HPRD of 0.51 from 2008 to 0.63 in 2011 were below the expected 1.08 and 1.12 HPRD during these years (Lee et al., 2015). And, the trends of nurse staffing between 1997 and 2009 showed a decrease in RN and RN skill-mix across all NHs and a rising trend in the LPN and NA HPRD in Medicaid concentrated NHs (Zhang et al., 2013). Substitution, though increases the TN HPRD, is a detrimental shortage of the appropriate and adequate required nurse staffing standards.

Falls

Falls are an unfortunate common occurrence in the elderly. The incidence of falls is reported to be happening to 50-75% of the 1.4 million older adult nursing home residents every year in the United States (Center for Disease Control and Prevention [CDC], 2015). Frailty and reduced physiological functionality predispose this population to increased danger of falling and, in some cases, the older adult residents sustain injuries such open wounds, fractures, and traumatic brain injury which leads to functional disability, morbidity, poor quality of life, and/or eventual deaths (Álvarez Barbosa et al., 2015; Cantalice Alves, et al., 2016; CDC, 2017; Damian, Pastor-Barriuso, Valderrama-Gama, & Pedro-Cuesta, 2013; McArthur et al., 2016; Oxtoby, 2017). NH residents are found to experience worse outcomes and complication rates after falls and upon admission to the hospital when compared to their community counterparts (Botwinick et al., 2016; McArthur et al., 2016). Impact of falls on the residents and their families continue to be a source of concern for NHs health care stakeholders. Hence, in order to underscore the significance of fall prevention among the older adults, the CMS uses falls as an important quality of care indicator for assessment and reporting of NHs' quality

performance while the ANA includes fall rate among its nursing sensitive quality indicators.

To contribute to effective preventive and treatment measures, researchers examined the different causes of falls among the older adults population. Results revealed that the causes of fall were most commonly due to presence of multiple diseases, cognitive impairment, increased mobility and physical activities, poly-pharmacy, urinary incontinence, unsafe gait/balance difficulty, weak body parts, malnutrition, limb impairment, decreased peak muscle power, and inadequate safety equipment (Álvarez Barbosa et al., 2015; Clancy, Balteskard, Perander, & Mahler, 2015; Damian et al., 2013; Lannering, Ernsth Bravell, Midlöv, Östgren, & Mölstad, 2016). Fall risk was correlated to lower limb performance; thereby predisposing older adult residents who have some increased mobility, self-care, functional independence (Álvarez Barbosa et al., 2015), ability to stand unaided, and intermediate level of functioning (Damian et al., 2013) to high risk of falls. Successful prevention of falls measures would involve assessment and identification of risk factors, especially the modifiable factors, and effective focused intervention activities (Álvarez Barbosa et al., 2015; Kadono & Pavol, 2013) which involve care delivery by higher skilled nurses.

Some studies have revealed that NH residents experience falls in different locations such as hallways, dining rooms, lounges, and the greater occurrences associated with fractures happen in the residents' bedrooms and bathrooms (McArthur et al., 2016; Robinovitch et al., 2013). Majority of the falls among residents happened during unknown activities (this implies that the staff was unaware of what and how happened

when the falls occurred), followed by when walking and transferring; and, infrequently during reaching, sitting, and standing (McArthur et al., 2016; Robinovitch et al., 2013). Residents were also found to fall during all hours of the day, with the most incidences happening in the early morning hours from 5 a. m to 8 a. m (McArthur et al., 2016). This time window is when care delivery process is heightened and the need for nursing care and assistance by the older adults from nurses is usually higher.

The Relationship Between Nurse Staffing Standards/Levels and Falls

Adequate nurse staffing levels are critical to NH residents' quality of care outcomes. Different levels of nurse staffing, skill-mix, and TN hours have been studied as predictors of falls among the NH residents and hospital patients (Backhaus et al., 2016; Cho et al., 2016; Sandoval Garrido et al., 2014; He et al., 2016; Horn et al., 2016; Kalisch & Tschannen, 2012; Leland et al., 2012; Schuelke, Young, Folkerts, & Hawkins, 2014; Shin & Hyun, 2015; Staggs & Dunton, 2014). In NHs, impact of nurse staffing levels on falls incidences were examined using total nurse HPRD and RN skill-mix (Backhaus et al., 2016), RN, RN skill-mix, and CNA HPRD (Shin & Hyun, 2015), CNA (Horn et al., 2016), TN HPRD (Sandoval Garrido et al., 2014), and CNA and LN HPRD (Leland et al., 2012). Similar trends, using these different types of nurse staffing levels, were observed in hospital-based studies (Cho et al., 2016; He et al., 2016; Kalisch & Tschannen, 2012; Schuelke et al., 2014; Staggs & Dunton, 2014; Staggs et al., 2012).

Insufficient number of nurse staffing HPRD affects the process and quality of care provided to the residents, including being with and supervising their activities in ways to prevent falls. Researchers, using different approaches that included quantitative

longitudinal, cross-sectional, as well as qualitative, or mixed methods, have shown an existence of relationships between nurse staffing levels, nurse staff to resident ratio, or nurse HPRD and older adults falls in NHs/long term care facilities and hospitals (Cho et al., 2015; He, et al., 2016; Kalisch & Tschannen, 2012; Shin & Hyun, 2015; Whitehead et al., 2015).

Overall, within and across studies, there was an inconsistent and mixed conclusions on the effects of nurse staffing levels and the rate of falls among the older adults. For instance, in the hospital settings, studies showed that at staffing trend levels, higher number of TN and RN skill mix HPRD (He et al., 2016), reduced number of patients per RN (Cho et al., 2015), increased number of RNs in moderately and/or highly staffed units (Staggs & Dunton 2012; Staggs et al., 2014), and increased TN HPRD (Kalisch & Tschannen, 2012) are associated with lower rates of falls or unassisted falls. Conversely, some of these studies showed positive relationships between RN, RN skill-mix, Non-RN, TN HPPD and falls/unassisted falls among the older adults; showing that increase in these staffing levels HPRD have led to increase in falls at seasonal levels or in certain hospital units (He et al., 2016; Staggs & Dunton, 2012; Staggs et al., 2014). In addition, no significant non-linear or lack of associations were evident with non-RN HPRD, RN HPRD when staff was at its lowest and unassisted falls (Staggs & Dunton, 2012; Staggs et al., 2014).

In NHs or long term care facilities, outcomes of studies on the relationships of nurse staffing and falls among the older adults were equally inconsistent and mixed (Leland et al., 2012; Shin & Hyun, 2015; Whitehead et al., 2015). Researchers found out

that the higher the number of TN (CNA and RN) per 100 residents (Sandoval Garrido et al., 2014), increase direct RN HPRD and increase ratio of RN to CNA skill-mix (Shin & Hyun, 2015; Whitehead et al., 2015), consistent staffing and higher CNA, RN/LPN HPRD (Horn et al., 2016; Leland et al., 2012) were related to fewer number of fall incidences in NHs and facilities providing long term care services for the older adults. In determining the RNs and LPNs' knowledge on eight causes of falls, Gray-Miceli, de Cordova, Crane, Quigley, & Ratcliffe (2016) found that RNs had higher average knowledge scores than the LPNs, even though neither correctly identified all the causes of falls among the older adults. The authors considered RNs' scores an indication of better performance in falls prevention (Gray-Miceli et al., 2016); making increased RN staffing level a positive factor in reduction of falls.

However, some of these studies showed a lack of statistically significant relationship between occurrence of falls and nurse staffing levels or skill-mix, all direct care nurse staffing HPRD including CNA, NA, LVN, baccalaureate prepared RN, trained feeding assistants, untrained staff, and trainees (Backhaus et al., 2016; Shin & Hyun, 2015; Whitehead et al., 2015) among the older adult NHs residents. A mixed methods study on newly admitted short-stay NHs residents concluded that LNs were not significantly associated with falls (Leland, et al., 2012), while a study by Backhaus et al. (2017) showed an increase in falls among the older adults in somatic facilities (wards that provide care for residents with physical disabilities) that employed baccalaureate prepared RN.

Pressure Ulcers

Pressure ulcers (PUs), also known as pressure injuries, pressure sores, bed sores, or decubitus ulcers are injuries to the skin tissue and underlying soft tissue occurring over a bony prominence as a result of intense and/or prolonged pressure (Matsudaira, 2014; The National Pressure Ulcer Advisory Panel [NPUAP], 2016). The development of PUs among the older adults, ages 65 and above, is an adverse, nursing care sensitive outcome that nationally or internationally pervades the lives of the geriatric population, either at the hospital setting, in the community, or NHs and other long-term care facilities (Castle & Anderson, 2011; Chiari et al., 2017; Dellefield & Magnabosco, 2014; Khor et al., 2014; Lannering et al., 2016; Lee et al., 2013; Mukamel et al., 2012; Rasero et al., 2015).

PUs adversely impact not only on the older adults' quality of life, but affect all NHs stakeholders, including the residents' families, policy makers, staff, health care organizations, health care payers, and governments. The affected residents experience impaired skin integrity, pain, infection, less than optimal quality of life, and death (Khor et al., 2014). In order to improve nursing care services and reduce or eliminate the prevalence of PUs, the CMS continues to use PUs as a quality of care indicator and safety measure for NHs performance evaluation (Backhaus et al., 2016; Bowblis & Ghatta, 2016; Chen & Grabowski, 2015; Lerner, 2013; Mukamel et al., 2012; RTI International, 2017). In the same vein, the Agency for Healthcare Research and Quality has also used PUs to assess quality of care in previous research.

Each year in the United States, PUs affect 1.3 to 3 million adults with an annual cost of treatment that range from $9.1 to 11.6 billion (Berlowitz, n.d; The Joint

Commission, n.d). In 2014, the prevalence of PUs in NHs was 5.1%, 5.3%, 4.8%, and 4.2% respectively for all facilities, FP, NFP, and government NHs (CMS, 2015). Deficiency citations for PUs continue to be high for NHs' failure to prevent or treat ulcers. All NH facilities received 12.8% deficiency citations for PUs in 2013 and 2014 respectively (CMS, 2015).

A recent longitudinal study of hospital inpatients showed that average rate of PUs among the patients with at least one PU was 1.8% over the five years of study (Bauer, Rock, Nazzal, Jones, & Qu, 2016). In an Italian-based cross-sectional study of 47 hospitals, 57 NHs, 37 home care services, and 11,957 older adult participants, researchers found that 24.66% (2949) and 50.75% (6067) patients and/or residents already had ulcers or had the risks of developing ulcers respectively (Rasero et al., 2015). A study on hospitalized older adults ages 60 and above revealed that 22.7% of 1083 participants developed 277 incidences of PUs between October 2013 and January 2015 while another study showed that 106 of 684 patient participants admitted to the hospital from the community and NHs between October 2012 and May 2013 had PUs (Chiari et al., 2017; Khor et al., 2014).

Pressure ulcers disease process involves redness and skin breakdown induced by prolonged lying or sitting down without movement (Jaul & Menzel, 2014). The immobility causes pressure, compresses blood perfusion, oxygen deprivation, and eventual damage to the skin and underlying sub-cutaneous tissue in the coccyx, sacrum, Ischia tuberosity, occiput, ear, and heels (Aygör et al., 2014; Bergstrom et al., 2014; Jaul & Menzel, 2014; Mallah, Nassar, & Badr, 2015; Matsudaira, 2014; NPUAP, 2016).

Factors predisposing the older adults to PUs, either as hospital inpatients or NH residents, are multidimensional, and, can be categorized into two: intrinsic and extrinsic factors. The intrinsic factors are related to normal aging process and presence of multiple diseases while the extrinsic factors are, in most cases, related to facilities' structural and process characteristics.

Intrinsic factors include advance age, limited functional ability, decreased mobility, ageing skin, impaired cognition, and urine and/or fecal incontinence (Aygör, et al., 2014; Jaul & Menzel, 2014; Kang, Tzeng, & Miller, 2016; Lannering et al., 2015; Rasero et al., 2015; Sving, Idvall, Hogberg, & Gunningberg, 2014). Others are gender, with male being affected more than female, race, where blacks are affected more than white, a low Braden Scale assessment score, dehydration, and weight lower than normal **(**Chiari et al., 2017; Kang et al., 2016; Kottner, Gefen, & Lahmann, 2011; Mallah et al., 2015). Multiple diseases contribute to the development of ulcers in older adults (Aygör et al., 2014; Bauer et al., 2016; Jaul & Menzel, 2014; Rasero et al., 2015). In a seven months' retrospective study of 209 hospital patients with a mean age of 78 years, rheumatoid arthritis (40%) and multiple myeloma (24%) were found to be the most common co-morbidities of the patients with PUs (Aygör et al., 2014) while in another retrospective, five years study of 670,767 patients, malnutrition (11.5%) was the highest associated risk factor followed by hypotension, peripheral vascular diseases, diabetes, and fractures (Bauer et al., 2016). In the randomized control trial study comprising 942 NH residents recruited from 20 United States and seven Canadian NHs, Bergstrom et al.

(2014) concluded that cardiovascular disease (75.7%) and dementia (71.3%) were the most common co-morbidities that contributed to the rate of PUs among the older adults.

Extrinsic risk factors of significance are the staffing characteristics as well as the care giving process. These include appropriate scheduling and skill-mix of nursing staff, sufficient TN HPRD, proper equipment, staff continuing education, knowledge, and periodic training about the geriatric care and PUs (Almeida Tavares, Silva, Sá-Couto, Boltz, & Capezuti, 2014; Dellefield & Magnabosco, 2014; Mallah et al., 2015; Jaul & Menzel, 2014; Rasero et al., 2015). Considering that prevention and reduction of PUs among the older adults largely depends on risks assessment, diagnosis, skin inspection, monitoring, observational reporting, and appropriate interventions like repositioning, skin care, nutritional support, skin care, and application/use of equipment (Chiari et al., 2017; Dellefield & Magnabosco, 2014; Jaul & Menzel, 2014; Kang et al., 2016; Mallah et al., 2015; Sving et al., 2014), staffing is an important factor that could help minimize the impacts of the extrinsic risk factors. The relationship between nurse staffing levels and development or prevention of PUs, albeit somehow inconsistent, is enumerated below.

The Relationships Between Nurse Staffing Standards/Levels and Pressure Ulcers

As stated above, PUs are one of the long-stay quality indicators that are most sensitive to care processes and staffing levels in NHs (Castle & Anderson, 2011). Association between nurse staffing levels and the development of PUs has been widely studied and shown to be characterized by three types of relationships: negative, positive, or lack of association. This is an indication of lack of agreement on the impact of nurse staffing on the development and prevention of PUs.

Two teams of researchers reported a positive, harmful, and contrary effects of the increase in nurse staffing levels, increase nurse-patient ratio, and/or higher nurse staffing HPRD and occurrences of PUs (Kang et al., 2016; Sandoval Garrido et al., 2014). Studying the facility characteristics and the risk of developing PUs in the United States' 1174 NHs and 12,507 participants, Kang et al. (2016) pointed out that an increase in TN HPPD increases PUs stages II-IV. In a quasiexperimental study on the relationship between facilities' structural characteristics and quality outcomes in Japan long-term care facilities, Sandoval Garrido et al. (2014) found a positive relationship between a higher number of RNs per 100 residents and 24-hour availability of nurse staffing and development or PUs outcome. Castle and Anderson (2011), on the other hand, found a lesser significance relationship between LPN staffing level and PUs outcome.

There is a consensus among researchers on the positive effects that higher nurse staffing is having or has had on development and prevention of PUs among the older adults. Studies showed that adequate staffing for all levels of nurses, especially RN, higher RN skill-mix, and TN hours impact the development and/or prevalence of PUs by reducing its prevalence and severity (Backhaus et al., 2014, 2017; Castle & Anderson, 2011; Cho et al., 2016; Dellefield & Magnabosco, 2014; He et al., 2016; Kang et al., 2016; Lee et al., 2013; Lerner, 2013; Lin, 2014; Park, Boyle, Bergquist-Beringer, Staggs, & Dunton, 2014; Sving et al., 2014; Whitehead et al., 2015). For instance, while all nursing staff levels were found to be negatively related to PUs in a systematic review of longitudinal studies on the variables of interest (Backhaus, Verbeek, van Rossum, Capezuti, & Hamers 2014), a longitudinal study of 2839 NHs showed positive influence

for RNs (11.7/100 residents), NAs (30.4/100 residents), and higher professional staff mix in relation to PUs (Castle & Anderson, 2011), and, another longitudinal study by He et al. (2016) found an inverse association between increase TN hours, RN skill-mix and PUs at the study trend level.

In addition, there is an agreement among some researchers on the inverse association between a number of patients/workload per RN and PUs quality outcome (Cho et al., 2016; Dellefield & Magnabosco, 2014; Dellefield et al., 2015). A large number of patients per RN, specifically, an addition of one patient per RN was found to result in 1% increase in PUs development (Cho et al., 2015). In a mixed methods study that explored nurses' perceptions of individual and organizational characteristics on PUs development in Veterans Home, Dellefield and Magnabosco (2014) found that teamwork, communication, and commitment among the NAs and LNs are required for inspection, detection, and successful prevention and reduction of PUs. Increased number of patients and workload per nursing staff was reported as a barrier to prevention and treatment of PUs.

In an integrative review study that focused on RNs and NH quality, Dellefield et al. (2015) concluded that most of the 67 studies reviewed showed that RNs and a higher ratio of RNs in nurse staffing skill-mix impacted positively on the development of PUs. Presence of a medical director or director of nursing was found to be a significant factor in lowering the risk of PUs development among 12,507 residents studied in 1,174 NHs (Kang et al., 2016) and presence of a caregiver, for at least half a day, was a protective

factor that is negatively related to development of PUs in older adults hospitalized for hip fractures (Chiari et al., 2017).

Studies that focused on RN hours and quality outcomes by Whitehead et al. (2015), Lee et al. (2014), and Sving et al. (2014) concluded that there were negative relationships between RN and TN HPRD and development of PUs. Whitehead et al. found higher RN staffing hours to be a protective factor against the additional development of PUs in the older adults residing in continuing care hospitals long-term care facilities; increase in RN HPRD results in the reduction of PUs. While, Sving et al. reported that decreased number of TN hours of care was associated with reduced likelihood of patients' repositioning and significant relationship with higher odds of PUs development, Lee et al., in their study on Colorado NHs' response to minimum staffing standards, reported that an increase in RN HPRD resulted in a robust relationship of 11.3% reduction of PUs rate of prevalence.

Contrary to the findings of negative and positive relationships on the impact of nurse staffing and PUs occurrences, some studies showed a lack of significant association between these variables. Examining some states NHs' responses to minimum staffing standards and its eventual impact on quality of care outcomes, few researchers reported no association between improved staffing levels and PUs (Bowblis & Ghattas, 2016; Chen & Grabowski, 2015; Matsudaira, 2014; Mukamel et al., 2012; Park & Stearn, 2009). In their study on NHs' responses to staffing standards and quality outcomes in New Mexico and Vermont, Bowblis and Ghattas (2016) found out that despite the

positive effects of staffing regulations on staffing levels, the latter neither impacted the facility-acquired PUs nor improve other quality outcomes.

In a study on the impact of California's increase direct care HPRD from 2.7 to 3.2 hours on outcomes in NHs, Matsudaira (2014) found no correlation between staffing levels, despite its increase, and care outcomes, including PUs. Similarly, in a nation-wide study of 16,352 NHs using instrumental variables techniques to examine the influence of state staffing regulatory stringency on NHs quality indicators, Mukamel et al. (2012) reported that risk-adjusted high-risk PUs had no statistically significant relationship with staffing regulations. Park and Stearns (2009), studying the effects of minimum staffing standards on staffing levels and quality of care in 15,217 NHs, also concluded that rate of pressure sores was not significantly related to increases in minimum staffing standards. Chen and Grabowski (2015) examined the effects of minimum staffing standards on staffing levels and NH quality measures in the states of Ohio and California and found no statistically significant relationship between the increase in nurse staffing HPRD of 5% that resulted from adherence to the regulation and PUs occurrences.

Four other studies on the impact of RNs staffing levels, RN staff-mix, and HPRD on care outcomes did not observe a correlation between these variables (Backhaus et al., 2016, 2017; Chen & Grabowski, 2015; Shin & Hyun, 2015). Backhaus et al. (2016) studied the relationship between HPRD, RN staff mix, and quality of care in Dutch NHs and concluded that quantity of nursing staff was not related to development and prevalence of PUs. Hence, they stated that extra manpower will not produce better quality care in NHs. In a subsequent cross-sectional study of 95 Dutch long-term

facilities that examined the impact of baccalaureate-prepared RNs (BRNs) on the quality of care, Backhaus et al. (2017) found no significant relationship between BRNs and the development of nursing home acquired PUs. However, Backhaus et al. explained that the very low, 4.8 minutes (which is lower than the required 0.75 RN HPRD in the US NHs) mean amount of BRNs time spent for care delivery per resident day might have caused the lack of a relationship. Shin and Hyun (2015) reported no significant relationship between RNs and PUs in Korean NHs' study that focused on the relationship between nurse staffing and quality of care.

Staffing Related Quality Deficiencies

Deficiency citation is a primary method for measuring NHs quality, for determination of Medicare and Medicaid funding, continuing certification, and for the public report of NHs performance (CMS, 2016: Harrington et al., 2014). Nursing homes are evaluated and cited for poor performance on quality indicators due to violations of federal regulations and expected standards developed by the CMS (CMS, 2016; McDonald et al., 2013; Lerner, Johantgen, Trinkoff, Storr, & Han, 2014). Quality deficiencies are cited by a team of state surveyors, during an annual inspection, for failure to comply with standards and the ensued citations represent the overall quality of care measures (Lerner et al., 2014; Matsudaira, 2014; Harrington, Olney, et al., 2012).

Named and tagged by the specific violated standard, the quality deficiency citations are ranked by scope, in terms of how many residents are affected; severity, which is the extent of harm caused by the quality standards violation, and rated by weighted scores from "A" – "L" with categories "G" through "L" being the most severe

deficiencies (Bowblis, 2011; CMS, 2016; Towsley, Beck, & Pepper, 2013; Wagner et al., 2012). The higher the deficiency score assigned to each category, the more serious and widespread the quality violations (CMS, 2016).

Researchers have used diverse approaches to measure NH quality with deficiency citation outcomes. Studies have focused on number counts and severity of citations in one or more specific major categories of quality indicators that include quality of care (QoC), quality of life (QoL), resident behavior (RB), and total health deficiencies (Lerner, 2013; Lerner et al., 2014; McDonald et al., 2013; Harrington et al., 2012; Hyer et al., 2011; Towsley et al., 2013; Wagner et al., 2012). Similarly, number counts and severity were employed in measuring deficiencies of quality indicator subcategories such as staffing, use of physical restraints and restrictive side rails, pressure sores, falls, physical decline, urinary tract infection, supervision to prevent accident, unnecessary drugs, and medication errors (Bowblis, 2011; Matsudaira, 2014; McDonald et al., 2013; Wagner et al., 2012). In addition to other methods of measurement, some studies employed the total number of deficiency scores, either at the state or national levels (Bowblis, 2011; Chen & Grabowski, 2013; Matsudaira, 2014; Hyer et al., 2011) while some studies dichotomized deficiency scores into percentiles for a consistent measurement and comparison (Lerner et al., 2014; McDonald et al., 2013; Wagner et al., 2012). F353 is issued when there is inadequate nurse staffing levels while F354 is issued when specific requirements for staff coverage and qualifications are not met (CMS, 2016; McDonald et al., 2013).

The implications of staffing related deficiency citations are significant for quality of care and quality of life for NH residents (Harrington, Olney, et al., 2012; Hyer et al.,

2011). Total deficiencies, QoC, and QoL, used as indicators of NHs quality performance, directly depend on adequate and appropriate nurse staffing levels (Harrington, Olney, et al., 2012; Matsudaira, 2014). It follows, therefore, that NHs policy makers and other NHs stakeholders continue to emphasize the importance of adherence to the minimum or recommended nurse staffing standards/levels.

The Relationship Between Staffing Standards/Levels and Quality Deficiencies

In the studies mentioned above, the majority of the researchers found negative significant correlations, a positive impact, between minimum nurse staffing standards or staffing levels and quality of care deficiency citations in NHs. Registered nurse staffing level was found to be correlated with reduced quality of care and total health deficiencies in many states' and nation-wide focused studies (Bowblis, 2011; Lerner, 2013; Harrington, Olney, et al., 2012; Harrington et al., 2014; McDonald et al., 2013; Park & Stearns, 2009; Wagner et al., 2012). In a study that focused on staffing related deficiencies, McDonald et al. (2013) discussed that RN staffing levels reduced the QoC and severe deficiencies. In the studies that determined the impact of direct care staffing requirements or standards on nursing care practices, staffing levels, and QoC (Bowblis, 2011; Park & Stearns, 2009), findings showed that increased staffing requirements were associated with fewer total deficiencies, reduced likelihood of a specific deficiency occurrence (Bowblis, 2011), and reduction in total health deficiencies for all NHs except FP NHs (Park & Stearns, 2009).

Examining the relationship between staffing levels, skill-mix, and deficiencies in Maryland NHs, Lerner (2013) found that RN HPRD was the only factor that significantly

impacted negatively on the severity of deficiencies. Indicating a negative association, Harrington, Olney, et al. (2012) found an inadequate number of RNs and insufficient HPRD as predictors of 36% higher total and 41% serious deficiencies found in the largest 10 FP NH chain while Wagner et al. (2012) showed that higher RN staffing level had a positive impact (negative association) on the quality of care and severity of deficiencies for physical restraints and restrictive side rails. An exception to these results was the study by Matsudaira (2014) who find no statistically significant relationship between staffing levels and QoC and total health deficiencies.

Except for Matsudaira (2014) who did not find a relationship between any staffing level and deficiencies, Towsley et al. (2013) who found a positive relationship between increased LPN skill-mix and total/QoC deficiencies, and McDonald et al. (2013) who reported a positive LPNs and deficiency citation relationship, researchers have equally shown a negative association between LPN staffing level and quality deficiencies (Bowblis, 2011; Chen & Grabowski, 2015; Harrington et al., 2014; Park & Stearns, 2009; Wagner et al., 2012). The studies on the impact of staffing standards on total number and severity of deficiencies showed that increased LPN staffing level resulted in fewer deficiencies (Chen & Grabowski, 2015; Park & Stearns, 2009).

Chen & Grabowski (2015) added that, in California and Ohio, adherence to staffing standards decreased the total number of deficiencies by 2.8%, severe deficiencies by 24%, and NHs with severe deficiencies by 60% over 10 years-1996-2006. Harrington et al. (2014) concluded that the 22 facilities belonging to a California large FP chain NH received more than three thousand QoC, QoL, and severe deficiency citations for poorer

staffing levels, including LPN, during 2003-2009 (Harrington et al., 2014). Higher LPNs were also found to be associated with decreased deficiency citations for use of restraint and restrictive side rail (Wagner et al., 2012).

In relation to CNA or NA staffing levels, there is almost a total consensus among researchers on their positive impact on the quality deficiency citations in NHs. Lerner (2013) stated that CNA had a positive influence on the number of deficiency citations while Lerner et al. (2014) found that increased CNA turnover in NHs was significantly related to the odds of having increased QoC, quality, RB, and total health deficiencies. Hyer et al. (2011) also found a negative relationship between CNA staffing levels and QoC or total deficiency scores. They concluded that each additional CNA HPRD and six minutes increase in CNA HPRD were found to reduce total deficiency scores by 10% and QoC by 3% respectively. Chen and Grabowski (2015), Bowblis (2011), Harrington et al. (2014), and Park and Stearns (2009) also reported a negative association between CNA HPRD and total health, QoC, QoL deficiencies. Conversely, Wagner et al. (2012) findings showed higher deficiency citation count and severity with higher number of NAs; Matsudaira (2014) reported a lack of statistically significant relationship between NAs and deficiencies.

Although there is rarity of studies that focused on examining the effect of LN (RN + LPN/LVN) on NHs quality deficiencies, one of the studies reviewed reported that higher LN turnover rate in NHs was significantly related to total and QoC deficiencies; a reduced LN and LN skill-mix were associated with increased deficiencies and reduced quality (Lerner, 2014). There was no statistically significant correlation between LN

staffing ratio (Hyer et al., 2011), LN and CNA staff mix (McDonald et al., 2013) and deficiencies.

Profit Maximization

In NHs, as in other organizations providing social and health care services, the goals for the enterprise may or may not include maximizing profit for the investors and shareholders. In accounting, maximization of profit translates to operating an industry at a level of surplus difference between total revenue and total cost or where marginal cost is equal to marginal revenue (Harrington et al., 2014; Park & Stearns, 2009; O'Boyle, 2012; Weech-Maldonado et al., 2012). In accordance with the conditions underlying the economics of supply and demand, profit maximization occurs when the market is perfectly competitive, the entrepreneur has a perfect knowledge of the market and is willing to assume risks, consumers are well informed, and production are made with a prospect of having surplus gain (Alhabeeb & Moffitti, 2013; Hawley as cited in Kirzner, 2002; O'Boyle, 2012; Simon, 1972).

Maximizing profits in NHs involves adopting the strategies that focus on increasing revenue and containing operating costs and expenses (Weech-Maldonado et al., 2012). Nursing homes can increase their revenue and profit by engaging in upcoding business activities by providing additional services to patients or coding them as sicker, changing the mix of residents towards more profitable payers, and admitting residents that have profitable case-mixes (Bowblis, 2015; Bowblis & Brunt, 2014). Increased use of ultra-high therapy Resource Utilization Groups and selling of stocks constitute other means by which NHs could increase revenue (Paul III et al., 2016).

Since health care labor cost incurred on staffing is the most expensive operating cost, decisions to increase profits and contain costs could involve reducing or maintaining lower nurse staffing levels, increasing patient-nurse staff ratio, reducing employee job benefits, and substituting cheaper lower skill staffers for higher skilled licensed nurse staffing that are more expensive, and reducing quality in other areas of residents care (Bos, Boselie, & Trappenburg, 2016; Bowblis, 2015; McDonald et al., 2013; Gichungeh & Kim, 2015; Harrington, Olney, et al., 2012; Hsu et al., 2016; Park & Stearn, 2009; Paul III et al., 2016). It is suggested that FP facilities are more likely to transfer their clients to the skilled facilities for financial gain from Medicare payments for skilled nursing care (Givens, Selby, Goldfeld, & Mitchell, 2012).

Profit maximization is almost always the goal of business for the FP category of NHs while the NFP, especially the religious-based NHs, exist to provide value based services (Grabowski et al., 2013; Harrington et al., 2015; Harrington et al., 2014; Harrington, Olney, et al., 2012; O'Boyle, 2012; Paul III, et al., 2016; Weech-Maldonado et al., 2012). FP NHs are presumed to set output, input, quality, and residents case mix in order to maximize profits (Grabowski et al., 2013). These NHs are publicly-owned by investors who have shares in the business and are expected to benefit from its profits and investments reward (Harrington et al., 2014; Hirth et al., 2013; Weech-Maldonado et al., 2012) thereby adding the pressure of maximizing profits to the operators of the facilities.

The NFP NHs, on the other hand, are non-governmentally owned by religious, community groups or agencies and operated as nonprofit organizations (Ronald, McGregor, Harrington, Pollock, & Lexchin, 2016). These facilities are precluded from an

assignment of property rights; they do not have defined shareholders, and are not subject to the pressure of distributing profits (Grabowski et al., 2013; Harrington et al., 2012; Hirth et al., 2013; Weech-Maldonado et al., 2012). On the contrary, the NFP facilities are expected to use the profit derived from operation for the benefit of the clients (Ronald et al., 2016). Effective performances of the NFPRB NHs are measured by the outcomes in how well they provide services; take care and meet the immediate needs of customers (Jacobs & Polito, 2012).

Studies have concluded that FP NHs performed financially better than NFP NHs in operating revenue, operating profit margin, and total profit margin (Harrington et al., 2014; Pradhan et al., 2013; Weech-Maldonado et al., 2012). Harrington et al. (2016) reported that Medicare profit margins in FP NHs were three times more than that of NFP NHs. Bos et al. (2016) concluded, in their systematic review study on NHs financial performance, that client and employee well-being that FP NHs had a better financial performance with higher profit margins and better efficiency than the NFP NHs. In situations that predispose FP NHs to possibility of having reduced profits, profit maximizing decision would rather jeopardize QoC services and outcomes (Bos et al., 2016; Harrington, Olney, et al., 2012; Harrington et al., 2014; Harrington et al., 2016; Hirth et al., 2014). Profit making NHs are strongly inclined to choose the profit maximizing levels of quantity and QoC (Aaronson et al., 1994; Harrington et al., 2014; Park & Stearns, 2009).

The Relationship Between Profit Maximization and Nurse Staffing Standards/Levels

The impact of maximizing profit, which is characteristic of FP NHs, has been studied in relation to nurse staffing levels in NHs. Prioritization for profit maximization in NHs have been reported to be significantly correlated to lower nurse staffing levels, serious staffing quality related deficiencies, and poor care outcomes in other areas of quality measures (Caravan et al., 2013; Gichungeh & Kim, 2015; Harrington, Olney, et al., 2012; Hsu et al., 2016; McDonald et al., 2013; Paul III et al., 2016). Examining the effect of profit status and chain affiliation in Ontario long-term-care homes, Hsu et al. (2016) found out that, despite the complexity of needs and the rise in proportion of residents who needed care services, the FP facilities had marginal to lack of growth in RN staffing level and higher use of cheaper, less skilled, support care workers. Hsu et al. added that the religious organizations had more direct care nursing hours than the FP organizations.

In a similar study, over 2003-2009 period, by Harrington et al. (2014), the profit maximizing chain of twenty-two NHs in California was found to have increasing high resident acuity (44-67% of total residents) and 34-44% revenue increase that were much high than other NHs. Nurse staffing hours were lower than the state required 3.2 TN for one-third of the total days during these years of study. These culminated in sixty-two annual or complaints surveys and several staffing-related deficiency citations throughout twenty-two facilities.

In most cases, RN HPRD have been shown to be compromised when administrators are required to maximize profits within the context of compliance with staffing standards (Aaronson et al., 1994; Dellefield et al., 2013; Harrington, Olney, et al., 2012; Harrington et al., 2014; Park & Stearns, 2009). RNs staffing level, the most important but more expensive nursing skill category, and their higher ratio in staffing skill-mix were found to be at a lower level in FP maximizing NHs compared to NFP NHs (Caravan et al., 2013; Gichungeh & Kim, 2015; Harrington, Olney, et al., 2012; Harrington et al., 2014; Hsu et al., 2016; Paek et al., 2016; Park & Stearns, 2009; Paul III et al., 2016). Likewise, these authors concluded that TN HPRD were also generally reduced in the FP NHs.

Harrington, Olney, et al. (2012) and Harrington et al. (2014) stated that all FP chains and other FP NHs had lower TN HPRD than their counterpart NHs operators. In response to nurse staffing standards and levels, FP NHs had lower staffing levels for all nurses (Paek et al., 2016). In their study on the relationship between ownership, staffing, and quality in Indiana using the CMS's five-star rating system, Gichungeh and Kim (2015) concluded that 35.9% of FP NHs received "above average" and "much above average" compared to 66.1% overall nurse staff rating received by the NFP NHs.

There are few studies that reported exceptions to reduced nurse staffing HPRD in the FP NHs. Harrington, Olney, et al. (2012) found higher TN HPRD in the FP NHs when there was an increasing percentage of residents who had limitations doing activities of daily living. Gichungeh and Kim (2015) reported no difference in LPN staffing levels in the two categories of NHs and McDonald et al. (2013) reported no conclusive evidence

of significant relationship between FP NHs and staffing-related deficiency citations. Bos et al. (2016), in their systematic review study on financial performance, employee and client well-being, found a study that failed to find differences in staffing levels between FP and NFP NHs.

Summary and Conclusion

The literature showed that TN staffing level was found to be improved in response to nurse minimum standards, mostly in the states with stronger minimum staffing standards. In many cases, NHs that positively responded to staffing standards decreased the RN, RN skill-mix, and LN HPRD by hiring more lower-skilled non-licensed staff like CNA to fulfill the TN requirements. Pressure ulcers/sores/injuries and falls are increasingly prevalent among the older adult NH residents due to their frailty, old age process, medical conditions, and vulnerability. It was evident that adherence to staffing standards and adequate staffing levels in NHs were negatively related to occurrences of PUs, falls, and staffing related quality deficiencies. Increased RN, RN skill-mix, and higher LN staffing levels were found to be significantly positive for avoidance of these adverse events. Profit maximization, on the other hand, was positively related to PUs, falls, and staffing related quality deficiencies but negatively associated with appropriate and/or required nurse staffing levels. Compared to the NFP NHs, the FP NHs, with a goal to maximize profits, were reported to have a better financial performance, reduced staffing levels, substitution of the most important but expensive RN staffing level, and poorer QoC outcomes.

To the best of my knowledge, there was no study that specifically examined the relationship between staffing standards, staffing levels using RN and LN HPRD, and the combination of PUs, falls, and staffing related quality deficiencies. As significant as profit maximization could be as an economic deterministic motivation for lack of adherence to staffing standards in NH industry, it was rare to find studies that used PMT as a theoretical framework for examining the relationship between these variables. I expanded the knowledge on this topic by using PMT as a theoretical lens to understand the microeconomic behaviors of the NHs in relation to adherence to nurse staffing standards/levels. In addition, most studies have focused on the FP and NFP groups of NHs while comparison of FP and NFPRB was found to be rare.

The current study contributed to knowledge by comparing the adherence to staffing standards and its impact on the variables of study in the FP and the religious subset of the NFP NHs. I used a quantitative correlational cross-sectional approach to examine the impact of profit maximization on the relationship between adherence to nurse staffing standards/levels, measured in terms of RN and LN HPRD, and occurrences of PUs, falls, and staffing related quality deficiencies in the two NHs of study. I describe the research design, sources of data, sampling strategy, and statistical data analysis procedure in the following chapter.

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Chapter 3: Research Method

The purpose of this quantitative, correlational, retrospective cross-sectional study was to determine and compare if there was a relationship between adhering to government staffing standards/regulations and residents care outcomes in FP and NFPRB NHs. I examined the impact of profit maximization on adherence to staffing standards/levels and their relationships to falls, PUs/sore/injuries, and staffing related quality deficiencies. I determined whether the NFPRB NHs were similarly characterized with profit making at the expense of quality care.

Using a correlational descriptive approach, information was collected from the CMS's CASPER, MDS 3.0, and MCR to determine how the independent variables, adherence to staffing standards, and profit maximization were related to falls, PUs, and staffing related quality deficiencies. I provided definition for staffing standards according to the hours per resident day recommended by the CMS while the quality of care outcomes was defined in terms of total number counts and severity of staffing related deficiency scores (Lerner, 2013; McDonald et al., 2013) and by the percentage of residents experiencing one or more falls with major injury and the percentage of high-risk residents with PUs for long stay residents (CMS, 2015).

Focusing on the use of government secondary sources information on NHs that have been made available to the public, in this chapter, I identify and discuss the study research design and the rationale for its usage and describe the chosen methodology, including the target population, unit of analysis, and sampling and sampling procedures. The process of collecting the information is discussed and the reputability of sources of

data is demonstrated. I also focus on the operational definitions of the variables of interest, analytical and statistical tests plans, a description of internal and external threats to validity, and an explanation of ethical procedures.

Research Design and Rationale

There are six variables of interest in this study. The independent variables were profit maximization and nurse staffing standards/levels, with a concentration on RNs and LNs-a combination of RNs and LPNs/LVNs. The dependent variables included actual facility nurse staffing levels (RNs and LNs), falls among the long-stay residents, Stages II-IV PUs/sores/injuries among the long-stay residents, and staffing related quality deficiency citations. NHs, the units of measurement, were also independent variables with two levels of measurement, which included the FP and NFPRB NHs. A correlational cross-sectional quantitative method using archival public data and descriptive/inferential statistics was appropriate for the study. The design was used to determine the relationship between profit maximization and adherence to staffing standards/levels and falls, PUs, and staffing related quality deficiencies with a focus on comparison of the two types of NHs of interest.

A cross-sectional design involves a collection of study information at a point in time (Creswell, 2009) and was useful for examining the information that has been collected and stored during the previous NHs survey. In cross-sectional designs, unlike experimental designs, the researcher does not have to be involved in the more complex random assignment of participants to study groups (Creswell, 2009; Frankfort-Nachmias & Nachmias, 2008). The design addressed the research questions on the phenomenon of

interest. The variables of study, nurse staffing standards, staffing levels, and quality outcomes in NHs, have been widely researched using cross-sectional correlational design (Dellefield et al., 2015; Harrington, Olney, et al., 2012; Lee et al., 2014; Min et al., 2016; Paek et al., 2016). The design is cost-effective and time-saving.

Secondary data analysis constitutes a common approach to studying the topic of nurse staffing standards/levels and care outcomes in NHs (Harrington, Olney, et al., 2012; McDonald et al., 2013; Paek et al., 2016; Shin & Hyun, 2015; Shuelke et al., 2014). The information of study has been collected by NHs government agencies, validated for reliability, published publicly online, and made available for easy access from the agencies' websites. The use of secondary data and a cross-sectional strategy reduced the cost of study administration, allowed for access to a large sampling frame, and provided a sample size with sufficient power to offset the threats to validity (Creswell, 2009). In addition, the quantitative design method strengthened the study in terms of generalization, validity, and reproducibility of results (Plano Clark & Creswell, 2008). As a strategy, the design is an easy, straightforward, cost-effective, time saving, and efficient for the study implementation (Creswell & Plano Clark, 2011).

Methodology

Population

The target population of interest in this study was older adults ages 65 and above, residing in NHs across the country. There are more than 1.4 million frail and vulnerable older adults residing and receiving care services by health care providers in approximately 15,600 diverse types of NHs (CDC, 2016; CMS, 2017a). The study

population included two categories of NH facilities: FP and NFPRB NHs. The FP NHs comprised 69.6% (10,895) and the NFPRB NHs comprised 3.6% (561) of the total NH population (CMS, 2017).

Sampling and Sampling Procedures

Proportional stratified random sampling (PSRS) was used to select an appropriate number of participating NH units from the two categories of NHs in the CMS's Nursing Home Compare CASPER report. In PSRS, the population is divided into homogeneous strata on the basis of characteristics of interest, and a determined sampling fraction is randomly chosen from each stratum to ensure that the proportion selected from both strata is representative of the units' proportion in the population (Frankfort-Nachmias & Nachmias, 2008; Polit & Beck, 2008; Teddlie & Tashakkori, 2009). In this study, data were collected and stratified into FP and NFPRB stratums, and the sample size was selected in relation to the proportional percentages in the sampling frame to ensure appropriate representativeness and minimize bias. The study sample was selected from the sampling frame using a simple random approach. All Medicare and Medicaid certified FP and NFPRB facilities that provided long-term care services for older adults 65 years and above were included in the study. Church related NFP and all types of FP were included while the government NHs were excluded from the study.

The PSRS was a beneficial approach to the study implementation. In addition to ensuring that the attributes of interest were present in all the groups, the strategy helped to reduce the probability of overrepresentation and underrepresentation of either group in the sample (see Houser, 2015). While the predetermination of proportional percentage or

ratio is beneficial for control of any extraneous variable that could threaten the validity and reliability of the study, the approach also ensured for a better representation of the population and elimination of bias (see Houser, 2015).

The percentage of the FP and NFPRB NHs, out of the total 15,662 NHs, are 69.6% (10,895) and 3.6% (561; CMS, 2017). NH participants were selected in proportion to the sampling frame of 10,895 and 561 for the FP and NFPRB NHs respectively. Using a *SE* of 5.0% and CI of 95%, a combined total of 604 (234 for the NFPRB and 370 for the FP) NH units constituted an appropriate sample size for the overall population of 11,452 NHs (The Research Advisors, 2006). This total number of sampled units was large enough to have sufficient statistical power and reduced sampling error by using a high statistical power of 0.80, an alpha set at 0.05, and a calculated adequate effect size (see Burkholder, n.d). This sample size was more likely to be normally distributed, represented the population without bias, had a minimal error, and revealed statistically significant differences between groups of study.

A collection of data for the study involved accessing the CMS's websites for information from the NHC published reports on staffing, providers, and surveys of residents' health. Similarly, MDS 3.0 was accessed from the same website for information on NHs quality measures-falls and PUs/sore/injuries. Contacts were made, as necessary, with the state of Idaho representative for the CMS's CASPER data for guidance and clarification on data usage and website navigation. These were not historical or legal types of data. The CMS was equally accessed for the profit maximization measures. There was no specialized permission required by the CMS for

gaining access to the data. The data were the NHs performance reports that were published for public consumption. The information can be accessed at https://data.medicare.gov/ and https://www.cms.gov/research-statistics-data-and-systems/downloadable-public-use-files/cost-reports/.

Operationalization of Variables

Nurse staffing standard, nurse staffing levels, profit maximization, PUs/sores/injuries, falls, and staffing related quality deficiency citations were the variables of interest in the study. The nurse staffing standard was defined as the extent to which the facility adheres or complies with the CMS's recommended nurse staffing requirements in terms of actual staffing hours spent by HPRD. Although the NHRA specifications, in terms of HPRD, required 0.08 and 0.30 of RNs and LNs hours respectively, the CMS recommended that a total of 4.1 (0.75 RNs, 0.55 LVN, and 2.78 CNAs) HPRD is necessary for prevention of serious harm and jeopardy to residents (Abt. Associates, 2013). Therefore, in this study, I focused on the CMS's recommended HPRD as the staffing standards/levels measuring indicator for the RN and LN HPRD. Researchers have used HPRD as measurements for all categories of nurse staffing standards/levels in NHs (Bowblis & Ghatta, 2016; Chen & Grabowski, 2015; Harrington, Olney, et al., 2012; Matsudaira, 2014; Paek et al., 2016).

Profit maximization is the achievement of maximum profits by NH entrepreneurs given their perfect knowledge of the market and the underlying condition of a perfectly competitive market (Alhabeeb & Moffitti, 2013; O'Boyle, 2012). NH entrepreneurs maximize profits when the facilities produce quantity and quality of care services to the

residents up to the point where the marginal cost of production or improvement equals the marginal financial gain (Aaronson et al., 1994; Alhabeeb & Moffitti, 2013; O'Boyle, 2012). Profit maximization was measured by the NH facilities' annual gains information derived from the MCRs. MCRs are financial reports comprising itemized financial and utilization information submitted annually by all Medicare-certified facilities (Bowblis, 2015). Profit measures, in this study, used the patient profit margins (PPM), the net income after operating expenses/costs have been deducted from patient care services revenues, and total operating profit margins (TPM) (Bowblis, 2015; Pradhan et al., 2013). The TPM excluded incomes from donations, investment, and interest payments (Bowblis, 2015; Pradhan et al., 2013). Bowblis (2015) and Pradham et al. (2013) have used these measures of profit maximization in previous research studies.

Falls was defined as the planned or unplanned lowering of the body to the floor and causing injuries (Kalisch et al., 2012) to long-stay NH older adult residents. Falls measurement focused on the incidence among the long-stay residents who have been residing in the NHs for more than 101 days. Average percentage of the residents who have experienced one or more falls with major injuries for Quarters 2, 3, and 4 in 2016 and Quarter 1 in 2017 was used (CMS, 2017a). The injuries included bone fracture, joint dislocations, and traumatic brain injury, and were calculated using the information from the CMS's NHC (Abt Associates, 2017; RTI International, 2017). Similarly, PUs/sores/injuries, defined as injuries to the skin tissue and underlying soft tissue occurring over a bony prominence due to intense and/or prolonged pressure (Matsudaira, 2014; NPUAP, 2016), was measured using the CMS's information on older adults with

the incidence. In this study, I used the average percentage information for Quarters 2, 3, and 4 in 2016 and Quarter 1 in 2017 on the long stay high-risk residents who experienced Stages II to IV Pus, and falls (CMS, 2017b).

Quality deficiency situations occur when NHs violate and perform poorly below the federal regulations and expected standards developed by the CMS (CMS, 2017a; Lerner, 2013; McDonald et al., 2013). The staffing related quality deficiencies was measured by the sum total number of occurrences and scope/severity of staffing related quality deficiency citations categories F353 and F354 (Lerner, 2013; McDonald et al., 2013). The total number of citations and the most severe levels of deficiency citations, J, K, and L, considered to be the worst level of quality outcomes that could cause harm and endanger the life of residents (CMS, 2015), were used as measuring indicators. F353 is issued when there are inadequate nurse staffing levels to care for every resident in a way that maximizes the well-being of the resident while F354 is issued when specific requirements for staff coverage and qualifications are not met; in this case, inadequate RN level for 8 hours a day, 7 days a week (CMS, 2017a; McDonald et al., 2013). These indicators were used in studies by Lerner (2013), McDonald et al. (2013), and Wagner et al. (2012).

Data Analysis Plan

The Statistical Package for the Social Sciences (SPSS) computer software program was used for all the statistical tests involved in this study. Information collected from the CMS's NHC has been processed and validated by the record keepers and checked for data abnormality and errors using SPSS. Datasets were collected for 2016

survey cycles of inspection. NHs listed as actively operating during this year were matched with quality measures of interest collected from CASPER, MDS 3.0, and the MCR.

Research Questions and Hypotheses

Research Question #1: What is the relationship of profit maximization between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs?

Research hypothesis/$H1_a$: There is a relationship between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs and profit maximization.

Null hypothesis/$H1_0$: There is no relationship between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs and profit maximization.

Research Question #2: What are the differences between NFPRB and FP NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes?

Research hypothesis/$H2_a$: There is a difference between NFPRB and FP NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes.

Null hypothesis/$H2_0$: There is no difference between NFPRB and FP NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes.

Research Question #3: What are the differences in staffing related quality deficiency citations issued for failure to meet federal quality standards in NFPRB and FP NHs?

Research hypothesis/$H3_a$: There is a difference in the occurrence of staffing related quality deficiency citations between NFPRB and FP NHs.

Null hypothesis/$H3_0$: There is no difference in the occurrence of staffing related quality deficiencies between NFPRB and FP NHs.

I used tests, including descriptive and inferential statistical tests, multiple linear regressions, and one-way multivariate analysis of variance (MANOVA) for describing, organizing, summarizing, comparing, and interpreting the data for a meaningful outcome (Frankfort-Nachmias & Nachmias, 2008; Green & Salkind, 2014). I analyzed the information collected using frequency distribution, measures of central tendency, independent *z*-test, and MANOVA. And, I carried out multicollinearity testing of the relationship between the independent variables to detect their correlation and prediction of the outcome variables.

I chose these tests for detecting the existing patterns and relationships useful for understanding the nature of the variables of measurement (Teddlie & Tashakkori, 2009). I used multiple regressions to know the predictive values of independent variables in research question one and MANOVA for research questions two and three. Inferential tests are useful in determining the magnitude of effects and whether the findings are occurring in actual sense or by chance/random error in the sample drawn for adequate representation of the population (Frankfort-Nachmias & Nachmias, 2008; Green & Salkind, 2014; Teddlie & Tashakkori, 2009). The tests, effectively, helped to predict and

explain the differences in profit maximization and adherence to nurse staffing standards, the two independent variables, and their impacts on falls, PUs, and quality deficiencies, the dependent variables, in the two groups of NHs.

I interpreted the study results based on the outcomes of tests that I calculated using the SPSS program software. In using the measures of central tendency, the mode represented the most occurring observation scores in the distribution while the two levels of NHs represented the nominal variables. Median and mean helped in determining the measures of dispersion and variability of quality of care indicators that represented the continuous level of variables (Frankfort-Nachmias & Nachmias, 2008; Hallstone, n.d). Independent statistical *z*-test was used to test for the statistical differences of the two NHs on the variables of measure, as stated in the hypotheses. The groups' statistical tables, generated from SPSS, reported the descriptive values that included mean, standard deviation-a value that represented how close or wide spread the data points were to their mean in each group, N-number of samples in each group, and a smaller standard error value indicated that the sample mean was more representative of population mean (Green & Salkind, 2014).

In the independent *z*-test table, calculated at 95% confidence interval and 0.05 *p*-value, an outcome *p*-value that was less than the 0.05 set value indicated a statistically significant difference in the means of the two groups of NHs. A narrower level of confidence interval provided higher certainty of confidence around the effect measure and representation of the actual population. I used MANOVA to determine the variability and the mean differences of the main effects and interactions between the NHs on the

dependent variables and provided information on whether the means between the groups were statistically significant (Green & Salkind, 2014; Houser, 2015; Laureate Education, 2009). Also, I used MANOVA to compare the variance of observations between the groups to the variance within each group (Houser, 2015).

Threats to Validity

In this quantitative study, there was less concern about threats to external validity and reliability issues due to the use of archival records or secondary sources of data. Archival data are unobtrusive in nature and include written public or private records of previously conducted studies and information initially produced for public consumption which is stored in various formats (Teddlie & Tashakkori, 2009). The source of my information made the study process un-obstructive and nonreactive, and allowed me to study the phenomenon without interfering with it and without the participants realizing that they are being, neither, studied nor reacting to it (Teddlie & Tashakkori, 2009). Hence, the study was strong for external validity.

Threats to internal and construct validity could be an issue in using archival or secondary sources of data (Cuffaro, 2011). Related threats to internal validity included confounding and selection bias. I addressed confounding problem and made sure that no variable other than independents variables caused the dependent variables by using appropriate statistical procedures that controlled for other factors that could have caused a spurious relationship with the dependent variables of the study. I used adequate statistical power, alpha, and effect size to, effectively, detect a relationship or difference between the variables of measurements (Houser, 2015). Using the PSRS strategy, I was able to

address the threats of selection bias. Furthermore, I randomly selected the two categories of NHs using a simple random approach and a predetermined fraction based on their proportions in the population.

Construct validity problem occurs when inadequate definitions and measures of variables are used in a study (Creswell, 2009). In order to address threats to construct validity, I used the CMS's definitions and measures, derived from CASPER and MDS 3.0, for the study constructs and variables. This information was considered reliable, consistent, and stable over time because it has been validated by the reporting public agency officials and used by previous researchers (Creswell & Plano Clark, 2011; Shin, 2013). In addition, the study data that I used were specific to the older adult population residing in NHs.

Ethical Procedures

I used secondary data that were already generated and published online for public consumption by the CMS. The datasets were a public record type of archival data, collected by the CMS from NHs on nurse staffing levels and assessment of the quality of care outcomes. The CMS collects, validates, and summarizes these forms of data from NHs survey inspections (Hyer et al., 2011). I collected the information from the CMS's NHC website and the CMS's homepage website, which did not require a user agreement and permission for access. Aside from NHs owners' information, which was not used for the study purpose, the CMS reports the staffing, quality of care outcomes, and health deficiency citation information mainly at the facility level without disclosing residents' identifiers.

There was, therefore, no resident privacy and confidentiality issues that could have endangered, harmed, or disempowered the vulnerable older adult population in this study. However, I complied with Walden University and Idaho State University Institutional Review Boards. The Walden University Institutional Review Board approval number for my study is 08-22-17-0242077. I made the information used for the study accessible to the dissertation committee member and statisticians. It is stored with password protection and would be destroyed after seven years.

Summary

The impacts of nurse staffing levels, especially RNs, and profit maximization on the development of PUs, occurrences of falls, and health deficiencies among the older adult residing in NHs necessitated a systematic inquiry implemented in the current study. In this study, I examined and compared the influence of profit maximization on adherence to nurse staffing standards/levels and the relationship of the latter to the care outcomes of interest between FP and NFPRB NHs. I used quantitative cross-sectional design, secondary data from the CMS's websites, stratified proportional random sampling strategy, and two main statistical tests, MANOVA and multiple regression, to implement the study. The nature and sources of data and the sampling strategy made the study less vulnerable to external validity, internal validity, construct validity, and free from research ethical problems. I present the study results in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this quantitative correlational cross-sectional study was to determine and compare the relationship between adherence to government staffing regulations and residents care outcomes in FP and NFPRB NHs. Furthermore, I examined the impact of profit maximization on adherence to staffing regulations/standards and care outcomes to determine whether the NFPRB NHs are similarly characterized with profit making at the expense of providing quality of care. Three research questions and three hypotheses constituted the foci of interest in this study.

The research questions focused on the relationship of profit maximization between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs; the differences between these NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes; and how the two NHs differ in staffing related quality deficiency citations. The three alternative hypotheses of study were as follows: (a) There is a relationship between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs and profit maximization, (b) there is a difference between FP and NFPRB NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes, and (c) there is a difference in occurrence of staffing related quality deficiency citations between FP and NFPRB NHs.

In this chapter, I present the time frame and discrepancies associated with data extraction/collection, change in sampling strategy, representativeness of the sample, and

change in analytical test plan. In the results section, I report the appropriate descriptive statistics characterizing the two groups of study and the statistical findings. I organize the findings by the three research hypotheses, and I provide and a summary of the answers to the hypotheses at the end of the chapter.

Data Collection

Time Frame for Data Collection

Secondary data for the study were collected from the publicly published CMS's NHC information and the MCR archive (CMS, 2017a, 2017b). Information on NHs' staffing, provider types, ownership types, falls, PUs, and staffing related deficiency citations were accessed from the CMS's Medicare.gov website. Time challenges with these variables included cleaning and matching the variables with the providers and/or ownership types. The MCR, unlike other variables, was very challenging to access. Therefore, it took a lengthy period of time to acquire the information. I contacted the data host support staff, used published literature, and a computer programmer for a successful extraction of the reports.

Discrepancies in Data Collection

The PSRS strategy that was intended for the selection of the sample size from the two categories of participating NHs was changed. I included all the available NH populations for study analysis, with the exceptions of NHs that were certified by the CMS to provide Medicare and Medicare services in 2016 and 2017, since the study was meant to use 2016 cycle survey data. Other criteria of selection included Medicare and/or Medicare and Medicaid only providers and nonhospital based NHs. Availability of data,

high representativeness, effective generalization of results, and adequate statistical power (see Houser, 2015) constituted the rationale for the change in sampling strategy. Previous studies on staffing standards/levels and quality of care outcomes in NHs have used available and a large number of existing NHs equally, rather than using a fraction of the population or sampling frame (Bowblis & Hyer, 2013; Park, Zhang, Wan, Unruh, & Meemon, 2016; Park & Stearns, 2009; McDonald et al., 2013).

Representativeness of Sample

All of the available FP and NFPRB NHs that met the above-mentioned criteria for selection were included in the sample. At the time of data collection, there were 10,895 FP (for all the four categories) and 561 NFPRB NHs (CMS, 2017). A total of 96% (10,525) FP and 89% NFPRB NHs were included in the study analysis, making the sample representative of the two populations of NHs being studied.

Changes in Analysis Plan

The planned statistical analysis for the study was changed after determining the data had not met the assumptions for the tests. Multiple linear regression was originally planned to test for (a) the relationship between profit maximization measures and falls, PUs, and deficiency citation measures and (b) the relationship between RN and LN staffing standards and falls, PUs, and deficiency citation measures in Research Question 1. The change was implemented because the continuous variables negated normality assumptions. For instance, staffing levels, measured by RN and LN HPRD, had skewness scores of 2.627 (*SE* of 0.023) and 2.046 (*SE* of 0.026) respectively. Normality tests results, using Kolmogorov-Smirnov, is reported in Table 1. The statistical significant

values of these variables were 0.000, which were less than 0.05, leading to the conclusion that the variables were not normally distributed. The skewness values were, also, more than double their *SE* values.

Table 1

Normality Test: Continuous Variables-RN/LN HPRD, Falls, PUs, Patient/Total Profit Margins

Variables	Kolmogorov-Smirnov[a]			Skewness	Std Error
	Statistic	*Df*	Sig.		
RN hours per resident day	.108	8701	.000	2.627	.026
LN hours per resident day	.109	8701	.000	2.046	.026
Total percentage of falls	.084	8701	.000	1.098	.026
Total percentage of PUs	.065	8701	.000	1.297	.026
Patient profit margin	.213	8701	.000	-9.041	.026
Total profit margin	.154	8701	.000	-2.216	.026

Therefore, I used Spearman correlation, a nonparametric test that does not assume normality for testing variables (Green & Salkind, 2014; Grove, Burns, & Gray, 2013), to determine the strength of the existing relationship between the ranked continuous variables, and binary logistic regression to determine the relationship between the ranked continuous independent variables and dichotomous dependent variables. I used cross-tabulation to determine the relationship between dichotomous independent and dependent variables.

In Research Question 2, I changed the statistical test for examining the differences between the two types of NHs on staffing standards, staffing levels, falls, PUs, and deficiency citations from using MANOVA to Mann-Whitney *U* for the continuous test variables for the same reasons. I performed a simple analysis, using cross-tabulation, to find the differences in the categorical variables in Research Question 3.

Results

Descriptive Characteristics

A total of 11,022 NHs constituted the units of analysis for this study, as shown in Table 2. There were 497 NFPRB NHs (4.5% of the total study population) compared to 10,525 FP NHs (95.5% of the total study population). It is imperative to mention that these were all the nation-wide, nonhospital based NHs that provided Medicare and Medicaid services prior to 2016.

Table 2

Frequency Table Representing Types of Ownership

NH types	Frequency	Percent	Valid percent	Cum. Percent
Not-for-profit religious –based nursing homes	497	4.5	4.5	4.5
For-profit nursing homes	10525	95.5	95.5	100.0
Total	11022	100.0	100.0	

The descriptive statistics for the continuous variables are presented in Table 3 (all NH population) and Table 4 (by ownership types). The statistical analysis showed that 20.2% of studied NHs did not report their expenses and costs to the CMS in 2016 (CMS 2017), leaving many missing cost data. For all NHs, approximately a $70,000 total profit margin was made on the average while a loss of about $154,000 was incurred from the services to the residents. Similar trends of losses and gains on patient and total profit margins were observed for the two NH types. On PPM, NFPRB NHs incurred a higher mean loss of about $1.3 million than the FP NHs, which had a mean loss of about

$112,000. The NFPRB NHs also had a higher total profit margin than the FP NHs. Standard deviation indicated a wide dispersion of these measures.

Table 3

Descriptive Statistics for the Continuous Variables: Profit Margins, Staffing Levels, Falls, and PUs in both Nursing Homes

Variables	Mean	*SD*	95% CI for mean		Minimum	Maximum
			Lower bound	Upper bound		
Profit margins						
N = 8799 (79.8%)						
PPM	-153588	1783165	-190851	-116324	-49357544	10241946
TPM	70091	1346356	41956	98226	-32706560	29887944
Staffing levels						
N = 10890 (98.8%)						
RN HPRD	0.76	0.39	0.75	0.76	0.04	6.33
LN HPRD	1.61	0.51	1.60	1.62	0.23	6.75
Falls						
N = 11019 (100%)						
Total average %	3.16	2.29	3.11	3.20	0.00	22.55
PUs						
N = 11019 (100%)						
Total average %	5.75	3.81	5.68	5.82	0.00	39.39

Note. RN = Registered Nurse, LN = Licensed Nurse, HPRD = Hours Per Resident Day, PPM = Patient Profit Margin accrued from services to the residents, TPM = Total Profit Margin accrued from overall operating cost and expenses

Statistical information on staffing levels revealed a mean LN HPRD that was more than double the mean RN HPRD for all NHs (Table 3) and FP NHs, except with NFPRB NHs where the mean RN HPRD was about 54% of the mean LN HPRD (Table 4). The minimum and maximum values were generally lower for RN than LN HPRD for all the NHs (Table 3) and for each of the NH types. However, the minimum staffing levels were lower in FPs compared to NFPRB NHs while the reverse was observed for the maximum levels. The total average percentage of fall was lower than the total average percentage of PUs across all NHs. However, the FP NHs experienced a reduced average

percentage of fall but a higher average percentage of PUs than the NFPRB. Maximum values on the two outcomes were higher in the FP than NFPRB NHs.

Table 4

Descriptive Statistics for the Continuous Variables: Profit Margins, Staffing Levels, Falls, and PUs by Nursing Home Types

Ownership types	Measures	Mean	*SD*	Minimum	Maximum	Fall [1]mean%	PUs [2]mean%
						3.1	5.8
For-profit NHs	Profits margins						
	PPM	-111673	1691244	-49357544	10241946		
	TPM	65431	1333966	-32706560	29887944		
	Staffing levels						
	RN HPRD	0.75	0.39	0.04	6.33		
	LN HPRD	1.61	0.51	0.23	6.75		
	Falls						
	Total Average %	3.11	2.27	0.00	22.55		
	PUs						
	Total Average %	5.81	3.82	0.00	39.39		
						4.0	4.6
Not-for-profit RB NHs	Profit margins						
	PPM	-1345153	3290006	-23928087	2084336		
	TPM	202560	1657602	-6417809	6962882		
	Staffing levels						
	RN HPRD	0.92	0.43	0.17	4.54		
	LN HPRD	1.71	0.52	0.41	5.96		
	Falls						
	Total Average %	4.00	2.58	0.00	13.00		
	PUs						
	Total Average %	4.58	3.43	0.00	30.30		

Note. RN = Registered Nurse, LN = Licensed Nurse, HPRD = Hours Per Resident Day, PPM = Patient Profit Margin accrued from services to the residents, TPM = Total Profit Margin accrued from overall operating cost and expenses, PUs = Pressure Ulcers, % = Total Average Percentage in Quarters 2-4 (2016) and Quarter 1 (2017).

[1] Standard (or Benchmark) for the Fall Mean % nationally is: 5.3% (2014) (CMS, 2015).

[2] Standard (or Benchmark) for the Pressure Ulcers Mean % nationally is: 12.8% (CMS, 2015).

The descriptive statistics for categorical variables are reported in Table 5. Staffing standards for RN and LN levels as well as citations for F353 (inadequate staffing deficiency for all nurses) and F 354 (inadequate staffing deficiency for registered nurses) were dummy coded as being met or not being met and yes or no citation. The occurrences of scope and severity of F353 and F354 were reported based on types and percentages. Out of 10,896 NHs that reported staffing levels, a lower number of NHs (41.1%) met the standard for RN levels (set at 0.55 HPRD) compared to higher number of NHs (75.9%) that met the LN levels (set at 1.30). In contrast, about 58% and 23% of NHs did not meet RN and LN levels respectively.

The number counts of F353 and F354 staffing related deficiency citations showed a higher percentage of no citations for the F354 than the F353 deficiency levels. The scope and severity of deficiencies, labelled B through L occurred in the F353 and B through F occurred for F354. The most severe deficiency levels, categorized as “J”, “K,” and “L” were found in F 353. The severe deficiency levels indicated the greatest scope and severity which can result in immediate harm or jeopardy to residents (Wagner et al., 2012; Yue et al., 2015). Occurrence of a higher number of citations for F353 (all nurses deficient measure) than F354 (RN deficiency measure) was an unexpected statistic given that there were more NHs that met LN rather than RN staffing levels.

Table 5

Descriptive Statistics: Categorical Variables-RN/LN Staffing Standards and Staffing Related Deficiencies for all Nursing Homes

Variables	*N*		Percent
	Valid	Missing	
Staffing standards (SS)	10896	126	
Registered nurses SS			
Standard met	4535		41.1
Standard not met	6361		57.7
Licensed nurses SS			
Standard met	8365		75.9
Standard not met	2531		23.0
Staffing related efficiencies	11022	0	
F353-citations counts			
Yes citation	804		7.3
No citation	10218		92.7
F354-citations counts			
Yes citation	276		2.5
No citation	10746		97.5
F353-Deficiency scope severity			
None	10218		92.7
B	2		.0
C	4		.0
D	134		1.2
E	451		4.1
F	154		1.4
G	18		.2
H	14		.1
I	2		.0
J	9		.1
K	14		.1
L	6		.0
F354-Deficiency scope/severity			
None	10746		97.5
B	5		.0
C	44		.4
D	47		.4
E	37		.3
F	143		1.3

Evaluation of Statistical Assumptions

I assumed, at the proposal stage of the study, that there would be sufficient data reported from all NHs of interest for adequate statistical analysis and robustness of study outcomes. Equally, I assumed that the information for independent and dependent variables would be normally distributed for using parametric tests for statistical analysis. However, one of the main independent variables, profit maximization measures, was difficult to access even though the information had been published online. The measures also had a high occurrence of missing data. All the continuous variables were found to be highly skewed and efforts to normalize them did not yield the expected outcome. Therefore, nonparametric tests were used, in majority of the cases, for the study analysis.

Statistical Analysis Findings

Research Question 1

What is the relationship of profit maximization between adherence to nurse minimum staffing standards and quality of care outcomes in NFPRB and FP NHs? In examining the relationship of profit maximization between adherence to staffing standards and quality of care outcomes in the NHs under study, two steps of analysis were performed. First, the relationship between the profit maximization measures-patient profit margin (PPM) and total profit margin (TPM)-were correlated with the quality of care outcome measures-falls, PUs, staffing related deficiency citations and severity for F353/F354. In this step, the continuous variables were converted to rank values and Spearman Correlation (*rho*) was performed for the ranks PPM/TPM (IV) and the ranks of the continuous variables (DVs) as shown in Table 6 while binary logistic regression was

performed between the ranks of PPM/TPM and the categorical variables as shown in Table 7.

Table 6

Spearman's Correlation: Patient and Total Profit Margins, PUs, and Falls

	Variables		PUs	Falls
NFPRB NHs	PPM	Correlation coefficient	-.119	.074
		sig. (2-tailed)	.040	.203
		N	299	299
	TPM	Correlation coefficient	-.138	.027
		sig. (2-tailed)	.017	.640
		N	299	299
FP NHs	PPM	Correlation coefficient	-.040	-.050
		sig. (2-tailed)	.000	.000
		N	8498	8500
	TPM	Correlation coefficient	-.047	-.062
		sig. (2-tailed)	.000	.000
		N	8498	8500

Note. NFPRB NHs = Not-For-Profit Religious-Based Nursing Homes, FP NHs = For-Profit Nursing Homes

The Spearman's Correlation results indicated that there were statistically significant relationships (p = .040; .017) between the PPM/TPM and PUs occurrences in the NFPRB NHs. Howbeit, both were in the negative direction. The results were not statistically significant (p = .203) between the PPM/TPM and falls, leading to the failure to reject the null hypothesis and conclusion that there was no relationship between these variables in the NFPRB NHs. Among the FP NHs, there was a negative but statistically significant (p = .000) correlations between the profit measures and PUs and falls.

The results of the binary logistic regression of the two profit measures on categorical variables LN/RN staffing standards, F353/F354 number counts and severity (J, K, L deficiency levels) showed the same odds ratio, *Exp(B) = 1,* for these variables occurrence with PPM and TPM. For all the variables in the NFPRB NHs, the p values

were greater than 0.05. Among the FP NHs, the relationship between the PPM and RN/LN staffing standards were statistically significant and the TPM and LN staffing standard and F353 counts were statistically significant. On the other hand, the PPM and F353/F354 counts, and F353 severity were not statistically significant. The TPM and RN standard, F354 counts, and F353 severity did not show statistically significant relationship. Analysis showed that neither of the NH types had severe levels of F354 deficiencies while NFPRB NHs had less score on severe F353 deficiency levels.

Table 7

Binary Logistic Regression for PPM/TPM and Categorical Variables by NH Types

NH Types	D. Variables	Regression Coefficients			
		B	df	Sig	Exp(B)
NFPRB NHs	LN Standard				
	PPM	.000	1	.250	1.000
	TPM	.000	1	.420	1.000
	RN Standard				
	PPM	.000	1	.648	1.000
	TPM	.000	1	.234	1.000
	F353 Counts				
	PPM	.000	1	.112	1.000
	TPM	.000	1	.205	1.000
	F354 Counts				
	PPM	.000	1	.324	1.000
	TPM	.000	1	.742	1.000
	F353 Severity	-	-	-	-
	F354 Severity	-	-	-	-
FP NHs	LN Standard				
	PPM	.000	1	.000	1.000
	TPM	.000	1	.001	1.000
	RN Standard				
	PPM	.000	1	.001	1.000

table continues

NH Types	D. Variables	Regression Coefficients			
		B	df	Sig	Exp(B)
	TPM	.000	1	.054	1.000
	F353 Counts				
	PPM	.000	1	.398	1.000
	TPM	.000	1	.002	1.000
	F354 Counts				
	PPM	.000	1	.405	1.000
	TPM	.000	1	.112	1.000
	F353 Severity				
	PPM	.000	1	.530	1.000
	TPM	.000	1	.603	1.000
	F354 Severity	-	-	-	-

Note: NFPRB NHs had less than two values on F353 severity; neither of the NH Types had any severe F354 deficiencies.

In Tables 8 through 13, the relationship between staffing standard measures (LN and RN) and F353/F354 deficiency citation number counts and F353 deficiency severity levels were examined in the two types of NHs using Crosstabs/Chi-square tests. The results showed that the association between the staffing standards and the care outcomes measured in the NFPRB NHs was not significant. The NFPRB NHs had an insignificant number of severe deficiency levels J, K, and L for F353 and zero record for F354 severity. Among the FP NHs, results were statistically significant for RN staffing standard and F354; LN staffing standards and F353; and LN staffing standards and F354. The relationship between RN staffing standard and F353 deficiency citation counts and between RN/LN staffing standards and F353 severity levels were not significant. The FP NHs had no record for severe F354 deficiency levels.

Table 8

Crosstabs: Relationship between RN Staffing Standard and F353 Deficiency Citation Counts

NH Types				No citation	Yes citation	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	RN staffing standard	Not met standard	Count	183	6	189			
			Exp. count	182.0	7.0	189.0			
		Yes met standard	Count	288	12	300			
			Exp. count	289.0	11.0	300.0			
	Total		Count	471	18	489			
			Exp. count	471.0	18.0	489.0			
	Pearson chi-square						.223[a]	1	.637
FP	RN staffing standard	Not met standard	Count	5722	450	6172			
			Exp. count	5713.0	459.0	6172.0			
		Yes met standard	Count	3911	324	4235			
			Exp. count	3920.0	315.0	4235.0			
	Total		Count	9633	774	10407			
			Exp. count	9633.0	774.0	10407.0			
	Pearson chi-square						.472	1	.492

Table 9

Crosstabs: RN Staffing Standards and F354 Deficiency Citation Number Counts

NH Types				No citation	Yes citation	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	RN staffing standard	Not met standard	Count	185	4	189			
			Exp. count	186.3	2.7	189.0			
		Yes met standard	Count	297	3	300			
			Exp. count	295.7	4.3	300.0			
	Total		Count	482	7	489			
			Exp. count	482.0	7.0	489.0			
	Pearson chi-square						1.024[a]	1	.312
FP	RN staffing standard	Not met standard	Count	5960	212	6172			
			Exp. count	6017.2	154.8	6172.0			
		Yes met standard	Count	4186	49	4235			
			Exp. Count	4128.8	106.2	4235.0			
	Total		Count	10146	261	10407			
			Exp. count	10146.0	261.0	10407.0			
	Pearson chi-square						53.299[c]	1	.000

Table 10

Crosstab: RN Staffing Standard and F353 Deficiency Severity

NH Types				Not severe	Yes severe	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	RN staffing standard	Not met standard	Count	189		189			
			Exp. count	189.0		189.0			
		Yes met standard	Count	300		300			
			Exp. count	300.0		300.0			
	Total		Count	489		489			
			Exp. count	489.0		489.0			
	Pearson chi-square						.[a]		
FP	RN staffing standard	Not met standard	Count	6155	17	6172			
			Exp. count	6157.2	14.8	6172.0			
		Yes met standard	Count	4227	8	4235			
			Exp. count	4224.8	10.2	4235.0			
	Total		Count	10382	25	10407			
			Exp. count	10382.0	25.0	10407.0			
	Pearson chi-square						.785	1	.376

Note. [a]: No record for F353 among the NFPRB NHs

Table 11

Crosstab: LN Staffing Standards and F353 Deficiency Citation Number Counts

NH Types				Not citation	Yes citation	Total	Value	df	Asymp Sig (2-sided)
NFPRB	LN staffing standard	Not met standard	Count	74	3	77			
			Exp. count	74.2	2.8	77.0			
		Yes met standard	Count	397	15	412			
			Exp. count	396.8	15.2	412.0			
	Total		Count	471	18	489			
			Exp. count	471.0	18.0	489.0			
	Pearson chi-square						.012[a]	1	.913
FP	LN staffing standard	Not met standard	Count	2236	218	2454			
			Exp. count	2271.5	182.5	2454.0			
		Yes met standard	Count	7397	556	7953			
			Exp. count	7361.5	591.5	7953.0			
	Total		Count	9633	774	10407			
			Exp. count	9633.0	774.0	10407.0			
	Pearson chi-square						9.755[c]	1	.002

Table 12

Crosstab: LN Staffing Standards and F354 Deficiency Citation Number Counts

NH Types				Not citation	Yes citation	Total	Value	df	Asymp Sig (2-sided)
NFPRB	LN staffing standard	Not met standard	Count	77	0	77			
			Exp. count	75.9	1.1	77.0			
		Yes met standard	Count	405	7	412			
			Exp. count	406.1	5.9	412.0			
	Total		Count	482	7	489			
			Exp. count	482.0	7.0	489.0			
	Pearson Chi-Square						1.327[a]	1	.249
FP	LN staffing standard	Not met standard	Count	2360	94	2454			
			Exp. count	2392.5	61.5	2454.0			
		Yes met standard	Count	7786	167	7953			
			Exp. count	7753.5	199.5	7953.0			
	Total		Count	10146	261	10407			
			Exp. count	10146.0	261.0	10407.0			
	Pearson Chi-Square						22.973[c]	1	.000

Table 13

Crosstab: LN Staffing Standards and F353 Deficiency Severity

NH Types				Not severe	Yes severe	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	LN staffing standard	Not met standard	Count	77		77			
			Exp. count	77.0		77.0			
		Yes met standard	Count	412		412			
			Exp. count	412.0		412.0			
	Total		Count	489		489			
			Exp. count	489.0		489.0			
	Pearson chi-square						.[a]		
FP	LN staffing standard	Not met standard	Count	2447	7	2454			
			Exp. count	2448.1	5.9	2454.0			
		Yes met standard	Count	7935	18	7953			
			Exp. count	7933.9	19.1	7953.0			
	Total		Count	10382	25	10407			
			Exp. count	10382.0	25.0	10407.0			
	Pearson chi-square						.272[b]	1	.602

The results of the relationship between the RN/LN staffing standards (categorical variables, and PPM, TPM, falls, and PUs using Mann-Whitney *U* (MWU) were reported in Tables 14 and 15. Among the FP NHs, the mean of ranks for fall, PUs, PPM, and TPM were greater when RN/LN standards were violated, except for PUs that increased despite meeting the standard for LN. Similarly, the NFPRB NHs had an increase in mean of ranks for all the measures when RN/LN were violated except for total profit margin (TPM) that decreased with non-compliance of both staffing standards. The *p* values for NFPRB NHs on RN/LN standards and variables of interest, except LN standard and fall, indicated no significant differences in outcomes while the relationship among FP NHs showed statistically significant differences in outcomes between RN/LN standards and the variables, save LN standard and PUs.

Table 14

MWU Ranks: Relationship between RN Staffing Standards and Falls, PUs, Patient/Total Profit Margins

NH Types	D. Variables	RN staffing standard	N	Mean Rank	Mann-Whitney U	Z	Asymp. Sig (2-sided)
NFPRB	Total percentage of falls	Not met standard	189	258.87			
		Yes met standard	300	236.26			
		Total	489				
	Test statistics				25728.00	-1.724	.085
	Total percentage of PUs	Not met standard	189	258.21			
		Yes met standard	300	236.67			
		Total	489				
	Test statistics				25852.50	-1.642	.101
	Patient profit margin	Not met standard	117	149.33			
		Yes met standard	176	145.45			
		Total	293				
	Test statistics				10023.00	-.384	.701
	Total profit margin	Not met standard	117	139.71			
		Yes met standard	176	151.85			
		Total	293				
	Test statistics				9443.00	-1.201	.230
FP	Total percentage of falls	Not met standard	6172	5385.88			
		Yes met standard	4234	4937.65			
		Total	10406				
	Test statistics				11940495.50	-7.479	.000
	Total percentage of PUs	Not met standard	6171	5386.75			
		Yes met standard	4234	4935.19			
		Total	10405				
	Test statistics				11930094.00	-7.533	.000
	Patient profit margin	Not met standard	4922	4300.76			
		Yes met standard	3493	4077.29			
		Total	8415				
	Test statistics				8139716.00	-4.158	.000
	Total profit margin	Not met standard	4922	4279.17			
		Yes met standard	3493	4107.71			
		Total	8415				
	Test statistics				8245971.50	-3.190	.001

Table 15

MWU Ranks: LN Staffing Standards and Falls, PUs, Patient/Total Profit Margins

NH Types	D. Variables	RN Staffing Standard	N	Mean Rank	Mann-Whitney U	Z	Asymp. Sig (2-sided)
NFPRB	Total percentage of falls	Not met standard	77	277.10			
		Yes met standard	412	239.00			
		Total	489				
	Test statistics				13390.50	-2.172	.030
	Total percentage of PUs	Not met standard	77	258.09			
		Yes met standard	412	242.55			
		Total	489				
	Test statistics				14854.00	-.886	.376
	Patient profit margin	Not met standard	47	163.90			
		Yes met standard	246	143.77			
		Total	293				
	Test statistics				4986.50	-1.493	.135
	Total profit margin	Not met standard	47	145.99			
		Yes met standard	246	147.19			
		Total	293				
	Test statistics				5733.50	-.089	.929
FP	Total percentage of falls	Not met standard	2454	5529.68			
		Yes met standard	7952	5102.84			
		Total	10406				
	Test statistics				8956652.50	-6.154	.000
	Total percentage of PUs	Not met standard	2454	5150.12			
		Yes met standard	7951	5219.32			
		Total	10405				
	Test statistics				9626103.50	-.998	.318
	Patient profit margin	Not met standard	1961	4428.03			
		Yes met standard	6454	4141.15			
		Total	8415				
	Test statistics				5896670.50	-4.580	.000
	Total profit margin	Not met standard	1961	4356.34			
		Yes met standard	6454	4162.93			
		Total	8415				
	Test statistics				6037242.50	-3.088	.001

Research Question 2

What are the differences between FP and NFPRB NHs regarding adherence to federal nurse staffing standards, actual staffing levels, and residents' care outcomes? Analysis was performed to determine the differences on RN and LN staffing standards

using crosstab and the differences on staffing levels-RN and LN HPRD, falls, and PUs using Mann-Whitney *U.* The results, in Tables 16 and 17 showed that higher percentages of NFPRB NHs met both RN/LN standards and reduced percentages of them were non-compliant when compared to FP NHs. Association between the NHs groups and standards were statistically significant at X^2 (1, N = 10896) = 82.014, p = .000 (RN) and X^2 (1, N = 10896) = 16.073, p = .000 (LN).

Table 16

Crosstab: Differences between NH Types on RN Staffing Standards

NH Types		Not met standard	Yes met standard	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	Count	189	300	300			
	% within Type	38.7	61.3	100.0			
FP	Count	6172	4235	10407			
	% within Type	59.3	40.7	100.0			
Total	Count	6361	4535	10896			
	% within Type	58.4	41.6	58.4			
	% of Total	58.4	41.6	58.4			
Pearson chi-square					82.014	1	.000

Table 17

Crosstab: Differences between NH Types on LN Staffing Standards

NH Types		Not met standard	Yes met standard	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	Count	77	412	489			
	% within Type	15.7	84.3	100.0			
FP	Count	2454	7953	10407			
	% within Type	23.6	76.4	100.0			
Total	Count	2531	8365	10896			
	% within Type	23.2	76.8	100.0			
	% of Total	23.2	76.8	100.0			
Pearson chi-square					16.073	1	.000

The results in Table 18 revealed higher means of the ranked variables for the NFPRB NHs in the areas on RN and LN staffing levels than their FP counterpart. The higher mean of falls rank indicated that the NFPRB NHs had worse outcome than FP NHs on this variable.

Table 18

MWU Ranks: NHs on RN/LN Hours Per Resident Day, Falls, and PUs

Variables	NH Types	N	Mean Rank	Mann-Whitney U	Z	Asymp. Sig. (2-sided)
RN HPRD	NFPRB	489	6904.50			
	FP	10401	5376.91			
	Total	10890				
Test statistics				1829594.50	-10.501	.000
LN HPRD	NFPRB	489	6265.24			
	FP	10401	5406.96			
	Total	10890				
Test statistics				2142191.50	-5.900	.000
Total percentage of falls	NFPRB	497	6621.57			
	FP	10524	5458.55			
	Total	11021				
Test statistics				2063262.50	-7.965	.000
Total percentage of Pus	NFPRB	497	4435.28			
	FP	10523	5561.28			
	Total	11020				
Test statistics				2080580.50	-7.711	.000

However, the NFPRB NHs exhibited better outcome (lower mean) on PUs than the FP NHs. The statistics showed that the four variables were statistically significant at p = .000.

Research Question 3

What are the differences in staffing related quality deficiency citations issued for failure to meet federal quality standards in FP and NFPRB NHs? I tested the failure to meet staffing related quality outcomes (F353 and F354 citations; F353 deficiency

severity) between the FP and NFPRB NHs using crosstab and presented the findings in Tables 19 and 20. The NFPRB NHs were associated with a lower number of deficiency citation counts for F353 and F354 than the FP NHs.

Table 19

Crosstab: Differences in F353/F354 Deficiency Citation Number Counts

NH Types		F353 citations			F354 citations		
		No citation	Yes citation	Total	No citation	Yes citation	Total
NFPRB	Count	478	19	497	490	7	497
	% within type	96.2	3.8	100.0	98.6	1.4	100.0
FP	Count	9740	785	10525	10256	269	10525
	% within type	92.5	7.5	100.0	97.4	2.6	100.0
Total	Count	10218	804	11022	10746	276	11022
	% within type	92.7	7.3	100.0	97.5	2.5	100.0
	% of total	92.7	7.3	100.0	97.5	2.5	100.0
Pearson chi-square	Value			9.276			2.559
	df			1			1
	Asymp. Sig (2-sided)			.002			.110

And, while staffing deficiency severity, F353, was observed among the FP NHs, none was observed for the NFPRB NHs. Neither NH types had F354 deficiency severity. Chi-square value was statistically significant for F353 deficiency citation counts but not significant for the remaining staffing related deficiency categories at $X^2(1, N = 11022) = 9.276$, $p = .002$ (F353 citations), $X^2(1, N = 11022) = 2.599$, $p = .110$ (F354 citations), and $X^2(1, N = 11022) = 1.278$, $p = .258$ (F353 severity).

Table 20

Crosstab: F353 Deficiency Severity

NH Types		Not severe	Yes severe	Total	Value	df	Asymp. Sig (2-sided)
NFPRB	Count	497	0	497			
	% within type	100.0	0.0	100.0			
FP	Count	10498	27	10525			
	% within type	99.7	0.3	100.0			
Total	Count	10995	27	11022			
	% within ype	99.8	0.2	100.0			
	% of total	99.8	0.2	100.0			
Pearson chi-square					1.278	1	.258

Summary

The relationship between the two profit maximization measures, PPM and TPM and the QoC measures, falls and PUs in the two types of NHs were examined. Findings showed a negative relationship with PUs and no relationship with falls, LN/RN staffing standards, F353 and F354 deficiencies total, and F353 deficiency severity in the NFPRB NHs. In the FP NHs, both profit margins were negatively related to falls and PUs, PPM was related to RN/LN standards but not related to F354 and F353 citations and severity. A relationship was found between TPM and LN standard and F353 while none was observed with RN standard, F353 and F354 citations, and F354 severity.

In the NFPRB NHs, analysis of the staffing standards and care outcomes produced nonsignificant results for F353 and F354 citations, F353 severity, falls, PUs, profit margins, and no occurrence of F354 severity. The results for FP NHs showed that the RN standard was statistically significant with falls, PUs, F354, PPM, and TPM but not to F353 citation count and severity while the LN standard was statistically significant

with falls, F353 and F354 citation count, PPM, and TPM but nonsignificant with Pus and F353 deficiency severity. Like NFPRB NHs, FP NHs had no record of F354 deficiency severity.

Results showed further differences between the two NHs on staffing standards, staffing levels, fall, and PUs. Compared to the NFPRB NHs, higher number of FP NHs did not meet the staffing standards and staffing levels for RN and LN. For falls and PUs, the NFPRB NHs performed worse on falls but better on PUs than the FP NHs. Scores for staffing related deficiency citations and severity were found to be worse for FP NHs.

In chapter 5, I summarize the interpretation of findings, review the study limitations, and discuss the potential positive implications for social changes at the individual NHs resident, family, health care organizations, and governmental levels. I also describe the implications for nursing education, nursing practice, and the recommendations for future nursing/health care research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to examine and compare the impact of profit maximization measures, patient profit, and total operating profit margins on adherence to registered and licensed nurses staffing standards/levels and quality of care outcomes in the NFPRB and FP NHs. The purpose of the study was to determine whether these two types of NHs were similarly characterized with profit making compared to the quality of care provided for the vulnerable older adult population residing in NHs. Findings showed that profit measures had no significant relationship with staffing standards and many of the care outcomes measures in the NFPRB NHs while a relationship was found with one or both standards and some of the care outcome measures in the FP NHs. Similarly, in the NFPRB NHs, staffing standards were found to be nonrelated to care outcome measures and profit margins. There were relationships between staffing standards and many of the care outcome measures and profit measures in the FP NHs. Both types of NHs were different when compared on adherence to staffing standards/levels, staffing related deficiencies, incidence of falls, and PUs.

Interpretation of Findings

In the present study, I found a relationship between RN and LN staffing standards and incidence of falls in the FP NHs and between LN staffing standards and occurrence of falls in the NFPRB NHs. Pressure ulcers were found to be associated with RN, not LN, staffing standard in the FP NHs while no statistically significant relationship was revealed with both staffing standards and occurrence of PUs in the NFPRB NHs.

Previous studies on staffing standards/levels and quality of care measures that included occurrence of falls and PUs have reported results that were similar to these outcomes. Shin and Hyun (2015), Whitehead et al. (2012), and Backhaus et al. (2017) found a relationship while Backhaus et al. (2016) found no significant association between RN staffing standard/level and occurrence of falls in NHs. Leland et al. (2012) also found no statistically significant relationship between LN staffing standards/levels and occurrence of falls in NHs.

RN staffing standards/levels were reported to be related with PUs occurrences in NHs (Backhaus et al., 2014; Castle & Anderson, 2011; Dellefield et al., 2015; Garrido et al., 2014; Lee et al., 2014; Whitehead et al). Backhaus et al. (2014) found a relationship between LN staffing levels and occurrence of PUs. While few researchers reported no statistically significant relationships with RN standards/levels (see Backhaus et al., 2016, 2017; Bowblis & Ghattas, 2016; Shin & Hyun, 2015), Chen and Grabowski (2015) and Matsudaira (2014) reported a lack of a significant relationship with LN staffing standards. This study contributed to knowledge on this topic by examining and comparing the existence of a relationship between the staffing standards and incidence of falls/PUs in the two categories of NHs. Results showed that compared to the NFPRB NHs that had a 38% occurrence of falls and PUs when RN staffing standards were not met and 15% when LN staffing standards were not met, whereas the FP NHs had a 59% occurrence of falls and 23% occurrence of PUs when RN and LN standards were not met.

Results on staffing standards and total number and severity of staffing related deficiency indicated that there were no significant relationships between staffing

standards and staffing related deficiencies in the NFPRBNHs. However, among the FP NHs, RN staffing standards were related to F354, LN staffing standards were related to both F353/F354 total number of deficiency but not to F353 severe deficiencies, J, K, and L levels, which constitute immediate jeopardy and could cause actual harm to the residents. Similar outcomes were reported for NHs nationwide. RN staffing standards/levels were reported to have a negative relationship with either the total number and/or severe levels of deficiencies (Bowblis, 2011; Chen & Grabowski, 2015; Harrington, Olney, et al., 2012; Harrington et al., 2014; Lerner, 2013, 2014; McDonald et al., 2013; Wagner et al., 2012) while no significant relationship was found with RNs (Matsudaira, 2014; Hyer et al., 2011) or LN staffing standards/levels (Hyer et al., 2011). McDonald et al. (2013) found a strong association between staffing deficiency citations/severity and staffing levels. The exception to these findings was that the results in this study showed that neither of the NH types had a record of F354 severe deficiencies. The comparison that I carried out showed that the NFPRB NHs did not have any statistically significant association between RN/LN staffing standards and staffing related deficiencies.

According to previous studies on profit maximization and adherence to staffing standards, profit making goals for NHs affected the extent to which the facilities employed adequate staffing hours and jeopardized quality of care outcomes (Geraedts et al., 2016; Gichungeh & Kim, 2015; Harrington, Olney, et al., 2012; Harrington et al., 2014, 2016; Hirth et al., 2014). RN staffing standards/levels were shown to be the most compromised when cheaper labor (such as licensed practical nurses and certified nurse

assistants) were substituted and found to be inadequate. This labor practice affected the quality of care in the FP NHs more than the NFP NHs (Gichungeh & Kim, 2015; Harrington, Olney, et al., 2012; Harrington et al., 2014; Paek et al., 2016). In this study, RN/LN staffing standards were significantly related to the profit measures in the FP NHs whereas the opposite was the case for the NFPRB NHs. In the study, I showed that the FP NHs made higher profits on both profit measures when RN/LN staffing standards were violated more than when they were met. Conversely, the NFPRB NHs made more profit from services to the patient (PPM) when RN/LN staffing standards were violated but more TPM when RN/LN staffing standards were met. The result that more TPM, an overall profit (compared to PPM), was made when RN/LN standards were adhered to than when violated was a contribution to knowledge on the relationship between RN/LN staffing standards and profit making. This is an important finding for NHs administrators and policy makers.

In the present study, I examined and found some negative correlations between the profit measures and PUs in the NFPRB NHs. Profit measures were negatively related with occurrence of falls and PUs in the FP NHs. This result did not confirm with most of the literature that reported a positive relationship between profit maximization and these quality measures among the FP NHs. Harrington, Olney, et al. (2012), Harrington et al. (2014), and Hirth et al. (2014) wrote that FP NHs tend to jeopardize the quality of care at the expense of profit making. Bos et al. (2016) also concluded that FP NHs had better financial performance but worse resident well-being than the NFP NHs.

When regressed on staffing standards and staffing related deficiency citation total counts and severity, profit measures did not have a statistically significant relationship with these measures in the NFPRB NH type. Among the FP NHs, PPM was found to be related with both staffing standards but not with any of the staffing related deficiencies, total counts, or severity. However, results showed that TPM was significant for LN staffing standards and F353 deficiency citation total counts but had no significant relationship with RN staffing standards and other staffing related deficiencies. Some of these results contradicted what other researchers reported on the association of profit maximization and staffing standards and deficiencies in the FP NHs. For instance, profit maximization was reported to be associated with reduced staffing levels and poor staffing related deficiencies (Harrington, 2014; Gichungeh & Kim, 2015; McDonald et al., 2013). The present study contributed to knowledge with the results that showed, among the FP NHs, that the PPM had no significant relationship with any of the staffing related deficiencies while the TPM had no relationship with F353 severity and F354 total counts and severity but only with F353 total counts.

Determination of the difference between the two NH types on both staffing standards and HPRD showed that larger numbers of NFPRB NHs met the recommended staffing standards, had higher actual staffing HPRD, and did better on occurrence of pressure ulcer than the FP NHs. Staffing related deficiency counts and severity levels were common among the FP NHs than NFPRB NHs. However, a larger number of FP NHs had better outcomes for falls than their NFPRB NH counterparts. Except for the fall outcomes, these results confirmed previous research findings that FP NHs had lower RN

and overall staffing standards/levels than the NFP NHs (Caravan et al., 2013; Gichungeh & Kim, 2015; Harrington, Olney, et al., 2012; Harrington et al., 2014; Paek et al., 2016; Park & Stearns, 2009). Hsu et al. (2016) reported lower RN staffing in FP NHs than the religious-based NHs. While Harrington et al. (2014) wrote that FP NHs received increased deficiency severity citations for PUs, Kang et al. (2016) reported that FP NHs were associated increased occurrences of PUs.

In 2014, the CMS (2015) reported that nationwide, the rate of PUs occurrence in FP NHs was 13.0% compared to 11.8% and 12.8% in the NFP and all facilities nationwide. Paul III et al. (2016) suggested that NFP prioritized the well-being of NH residents over profit making than the FP NHs. Conversely, Ucar and Nisanci (2015) wrote that the religious faith-based NHs were no better with deficiency scores than other types of NHs, including the FP NHs. Wagner et al. (2012) reported a decrease in the number of deficiency citations in relation with FP NHs.

In relation to the study theoretical framework, I proposed that profit maximization had a positive relationship with the incidence of PUs and falls, staffing related quality deficiencies, and a negative relationship with RN/LN staffing standard and hours. And, I suggested that adherence to staffing standards for RN/LNs had a positive relationship with RN/LN staffing hours and, in turn, a negative association with care outcome measures. The study findings, to a large extent, confirmed these propositions, especially with the outcomes that were largely not statistically significant for NFPRB NHs compared to FP NHs. When standards were not adhered to, both types of NHs had higher fall and PUs incidences than when standards were met. High profits measures were

observed in the FP NHs when staffing standards were violated. An unexpected outcome was seen with increase in falls in the NFPRB NHs than in the FP NHs. The specific comparison between these types of NHs on the studied quality of care measures using the PMT theoretical framework was a significant contribution to knowledge in the field of study.

Limitations of the Study

There were few limiting factors associated with this study. The cross-sectional (Towsley et al., 2013) approach to the study allowed for a short, limited time span. The study covered NH data that were specific to 2016 and excluded facilities that were certified to provide Medicare and Medicaid Services in 2016 and 2017. This prevented evaluation of performance over a longer period of time for a better understanding and comparison between these NHs. Even though using secondary data provided a large amount of information that contributed to robustness of findings, survey approach and/or mixed methodology might have provided better understanding of the issues of study interest.

Although a larger sample size of the two categories of NHs was conveniently pooled, inclusion of only the free-standing Medicare and Medicaid NHs was a limitation to generalizability of the study results. Furthermore, the large difference in the size of the two groups of NHs could have affected the study outcomes. However, a change in sampling strategy was considered due to availability of information and expected high representativeness that could be attained from using the large number of NHs (Z. Htway, personal communication, September 3, 2017). According to P. Denner (personal

communication, September 1, 2017), "direct calculation of the population parameters based on the data from the entire population is better than trying to estimate the population parameters from a sample." In addition, researchers have used available and large numbers of existing NHs rather than a sample for similar studies (Bowblis & Hyer, 2013; Park, Zhang, Wan, Unruh, & Meemon, 2016; Park & Stearns, 2009; McDonald et al., 2013).

The reliance on CASPER and MCR, self-reported information by the NHs, could have undermined the objectiveness of the study outcomes. Many NHs that did not provide their operating financial reports to the Medicare administration for the year 2016 could have impacted on the results. Equally, using the reported deficiencies could have affected results due to variations of performance among the surveyors (Lerner et al., 2014).

Recommendations

Further research is needed to determine the effect of other profit measures on NH care process and nursing case sensitive outcomes using profit making related theory. Studies have rarely used PMT to examine the mediating effect of profit measures on quality of care outcomes in the NH industry (Harrington et al., 2014; Hirth et al., 2014; Paul III et al., 2016; Park & Stearns, 2009). More importantly, a mixed methodology (Backhaus et al., 2016; Harrington et al., 2014; Towsley et al., 2011) approach, with a longitudinal quantitative phase (He et al., 2016; McDonald et al., 2013; Wagner et al., 2013; Whitehead et al., 2015), would elicit a well-rounded outcome on the topic.

Qualitative research for exploration of perceptions among stakeholders on nurse staffing levels, adherence to staffing standards, profit maximization, and their impact on care outcomes is needed to support the quantitative collection and analysis of data for an in-depth understanding of the quality of NHs care outcomes. More comparative studies among NHs of different ownership types (Paul III et al., 2016; Harrington et al., 2014; Whitehead et al., 2015) are needed to provide a benchmark for better mode of NHs operation and better quality of outcome for the residents.

Implications

Diverse stakeholders are affected by lack of adherence to NH staffing standards and the issue of inadequate staffing levels for registered and licensed nurses. Deficiencies in these areas of NH operation continue to impact not only the vulnerable population residing in the NHs, but also on their families, government agencies, health care organizations and professionals, insurers, and the public. A closer examination of the present study results by NH operators could, potentially, affect care delivery processes and positively enhance the quality of care outcomes and life for the residents.

The outcomes about the higher level of falls in NFPRB was an indication that this category of NHs needs quality improvement measures for fall. Consideration of the outcomes about the negative relationship between patient and total profit margins and adherence to staffing standards in the FP NHs provides a basis for potential policy change among NHs insurers and government agencies (Shin & Hyun, 2015; Towsley et al., 2015). NHs and public policy makers and enforcers will find the study results useful as evidence for policy making, policy implementation, and policy enforcement (Gichungeh

& Kim, 2015; Harrington et al., 2014, 2015; McDonald et al., 2013; Towsley et al., 2015; Park & Stearns, 2009).

The public will find the study results useful to make informed decisions for a better NH placement for their loved ones. The NFPRB NHs might get a better public rating, which could positively affect their marketability (Hyer et al., 2011; Edgman-Levitan, 2014). Healthcare professionals will find the study outcomes useful for positive social change as they improve curriculum of geriatric education, prepare students for the discipline, and advocate for NHs residents. My goal for the present study was to positively affect the lives and experience of the vulnerable, older adult, NH residents through the provision of adequate RN/LN staffing levels and eventual reduction and/or elimination of adverse events and untimely death.

Conclusion

The older adult NH residents deserve optimal quality of care outcomes and life. In all Medicare and Medicaid certified NHs, residents should experience better care outcomes that are ensured by adherence to adequate staffing standards and actual staffing of RN and LN levels of caregivers. Jeopardizing quality of care for this population, at the expense of profit maximization, is immoral. Pressure ulcers, fall, and staffing related quality deficiencies are costly and constitute an unpleasant, potentially deadly but avoidable adverse event. Older adults residing in NHs should not be treated like economic commodities/output for which the quantity and quality are produced up to the point where marginal cost of production is kept below marginal gain for the purpose of making higher financial gains. Policy change and/or amendment at all levels involved

with the care of this population might be the key for resident-centered quality improvement in NHs. This study, through its comparative analysis between the FP and NFPRB NHs, constituted an informing tool in the positive social change direction.

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