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Doctoral Study Effects of Mandatory Staffing Requirements on Quality Indicators in Long-Term Care

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2023

Abstract

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Long term care facilities continue to struggle to improve the quality of care, which affects publicly reported data and reimbursement. The purpose of this study was to evaluate if state-mandated staffing ratios affected CMS survey ratings for CMS Region 7, which consistedof Iowa, Kansas, Missouri, and Nebraska. The theoretical framework was grounded by Donabedian's quality theory, which described quality is made up of the elements of structure, process, and outcomes. This study included two research questions evaluating if there wasa correlation between minimum staffing ratios and quality of care in long-term care facilities among the four states in CMS Region 7 and if quality of care scores were higher in long-term care facilities due to state minimum staffing requirements among the four states in CMS Region 7. A quantitative correlation research design was used with non-probability sampling to include all nursing homes in the identified states using secondary data from CMS. Spearman's ρ determined that a correlation existed between staffing ratios and quality of care rating. A Mann-Whitney U test concluded that there wasnot a significant difference between the groups with no minimum staffing requirements and states with minimum staffing requirements. The potential impact of this study onpositive social change is at the individual, organizational, and policy levels. Individual patients and nursing home facilities can benefit from the recognition of providers regarding association of minimum staffing ratios impacting quality of care that is delivered in long term care facilities.

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Dedication

I would like to dedicate my dissertation to those that made it possible for me to achieve. First of all is my understanding and encouraging husband, Thomas Reed. Without his support, I would not have been able to take the time needed to complete this lifetime milestone. I would also like to dedicate my dissertation to my deceased mother. She showed me at a young age the importance of education and setting your goals for achievement. In conclusion, I would also like to recognize my sister, father, and son for their support.

Acknowledgments

I would like to acknowledge those that made a substantial impact on my doctoral studies journey and should be recognized for their assistance. By far, the most influential and supportive person in my achievement has been my committee chairperson Dr. Matt Frederiksen-England, who I first met in residency. The countless hours on emails, phone calls, reviews and encouragement will never be forgotten. I would also like to thank my second committee member Dr. Lee Bewley, and Dr. Kristin L. Wiginton, University Research Reviewer for their participation and assistance.

Table of Contents

List of Tables

List of Figures

Section 1: Foundation of the Study and Literature Review

Quality of care in long-term care settings has been perceived as an ongoing problem and concern (Myhre et al., 2020). To solve this problem, researchers and regulators have determined that mandated minimum nurse-to-patient staffing ratios directly improve patient outcomes (Rosenberg, 2021). In 1987, the Federal government established minimum staffing regulations for long-term care facilities through the Nursing Home Reform Law. This law required nursing homes to provide licensed nursing services 24 hours a day with a registered nurse (RN) on staff at least 8 consecutive hours a day, 7 days a week (Harringtonet al., 2020). No legislative changes have been made to the initial requirement for over 4 decades even though a study by CMS recommended staffing ratios of 4.1 nursing hours per patient per day to prevent patient harm (Childress et al., 2022). Current staffing requirements for states beyond the loose federal regulations vary from state-to-state, as some have no additional staffing requirements and other states requiring more than 3.5 hours of nursing services per patient per day. Table 1 shows the number of states without staffing ratios and the number of state mandated staffing ratios along with the staffing ratios. Fifteen states still have no additional required staffing ratios (Childress et al., 2022).

Table 1

Staffing Ratios by State

Staffing ratios	States
N/A	15
<1.99	2
2.0-2.4	13
2.5-2.99	8
3.0-3.49	6
>3.50	7
Included DC	

Note. From "State actions to address nursing home staffing during covid 19," by E. Childress, M. B. Musumeci, &B.Harris,2022(https://www.kff.org/medicaid/issue.brief/state-actions-to-address-nursing-home-staffing-during-covid-19/view/footnotes).

This study was to determine the effects of mandatory staffing ratios of long-term care settings and quality of care indicators. Staffing shortages in nursing homes have existed for decades, but the COVID-19 pandemic has highlighted and intensified the need for sufficient, consistent, trained staff to care for residents. Many studies have cited that high staffing levels are associated with higher care quality, but state requirements are low (Childress et al., 2022). Potential positive social change from this study could affect legislative changes by states or assist long-term care facilities individually with staffing their long-term care facilities to increase resident safety.Section 1 contains the

background, the problem statement, the purpose statement, the research questions, the theoretical framework, nature of the study, literature search strategy, literature review related to key variables and/or concepts, definitions, assumptions, scope and delimitations, limitations, significance and summary and conclusion.

Background

A literature review on mandatory staffing requirements in long-term care settings reflected that without minimum staffing ratios patients suffered adverse harm events (Phillips et al., 2021). Lower staffing ratios led to increased mortality, readmissions, and increased lengths of stays for patients (Rosenberg, 2021). Resident injuries were lower and overall satisfaction increased correlated to the employee's reports of job satisfaction (Plaku-Alakbarova, 2018). Current research has determined that higher staffing ratios will result in better quality of care for long-term residents. Overall, very limited data for nurse staffing and patient care outcomes has been studied (Imam et al., 2022). Furthermore, researchers have not studied the different staffing ratios between states to evaluate the impact on quality of care.

A gap in the knowledge is the range of staffing ratios in CMS Region 7 and the effect on quality-of-care indicators. This study was needed to assist health care administrators to understand the effect of staffing minimum ratios at specific levels and the effect on the quality of care. Consumers of long-term care will benefit from appropriate staffing levels.

Problem Statement

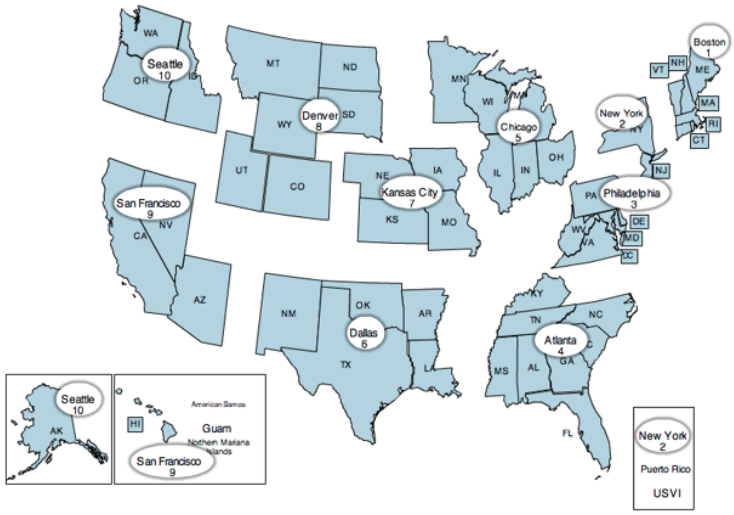
Mandated higher minimum nurse-to-patient staffing ratios directly improves patient outcomes including the measurements of decreased mortality, hospital readmission and hospital length of stay rates (Rosenberg, 2021).The specific research problem addressed through this study is do states with mandatory staffing ratios provide a higher level of care to patients. Studies have repeatedly shown that lower staffing ratios lead to increased mortality, readmission, and increased lengths of stays (Rosenberg, 2021). A gap in the literature failed to compare CMS Region 7 and the star ratings for overall quality of care measures.

Purpose of the Study

The purpose of this quantitative study was to determine if there is an association between the independent variable of mandatory staffing ratios and the dependent variable of CMS survey ratings used for determining the quality of care in CMS Region 7 consisting of Iowa, Kansas, Missouri, and Nebraska. Quality of care ratings consist of overall rating.CMS Region 7 was selected for this study based on the comparable staffing requirements by each state and number of nursing homes.

Figure 1

CMS Regions



Note: (CMS, 2023).

Research Questions and Hypothesis

RQ1: Is there a correlation between minimum staffing ratios and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska)? CMS Region 7 consists of these four states with comparable number of nursing homes in each state?

$H_0$1: There is no statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

H_a1: There is a statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

RQ 2: Are quality of care scores in LTC settings higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska)?

$H_0$2: There is no statistically significant association between quality of care in LTC settings and minimum staffing ratios among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

H_a2: There is a statistically significant association between quality of care in LTC settings and minimum staffing ratios among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

Theoretical Foundation of Study

This study was grounded by Donabedian's quality theory that has become the framework for evaluating quality in healthcare. Structure, process, and outcome are the three dimensions evaluated and influenced and affect each other (Donabedian, 1988). Figure 2 shows the Donabedian model.

The logical connections between the framework presented and the nature of my study are the examining health services and evaluation of the quality of healthcare through minimum staffing ratios. The three components are structure, process, and outcomes. Structure measures have an effect on process measures, which in turn affect outcome measures (Donabedian, 1988). Structure measures include staff-to-patient ratios and process measures reflect the way systems and processes work to deliver the desired outcome. Level of care is the process measure for this study. Finally, the outcome measures reflect the impact on the patient and demonstrate the end result of improvement

work and whether it has ultimately achieved the aim(s) set. The outcome measures include quality of healthcare and staffing ratios.

Figure2

The Donabedian Model

Note: From "Closing the quality gap: a critical analysis of quality improvement strategies," by McDonald et al.,2007 (https://pubmed.ncbi.nlm.nih.gov/20734531).

Nature of the Study

To address the research questions in this quantitative study of the specific research design consisted of a comparison between the independent variable mandatory staffing ratios and the dependent variable of CMS survey ratings used for determining the quality of care in CMS Region 7 (Iowa, Kansas, Missouri, and Nebraska).

Spearman's Rank Correlation for RQ1 was used to understand the correlation between the independent variable and each of the dependent variables (Frankfort-Nachmias et al.,2020).To address the second research question in this quantitative study, the Mann-Whitney U test was used (Frankfort-Nachmias et al.,2020).

Literature Search Strategy

To search for relevant literature to review for this study, phrases, keywords, and trends used related to staffing ratios and long-term care. The following keywords and phrases were used for the searches: (a) Long term care, (b) staffing requirements, (c) Iowa, Kansas, Missouri, and Nebraska, (d) CMS nursing home, and (e) 5-star ratings. The literature reviewed included peer-reviewed, scholarly journals with a publication year between 1988-2022.

Literature Review Related to Key Variables and/or Concerns

Recent quantitative cross-sectional research has mostly shown that mandated minimum nurse-to-patient staffing ratios directly improve the quality of care in long-term care (Rosenberg, 2021). Researchers in the healthcare administration discipline have approached the problem of low quality of care by identifying several contributing variables. Rosenberg's quantitative cross-sectional study focusing on the effects of nursing staffing ratios and the quality of care received in long-term settings supporting statistical analysis that mandated higher minimum nurse-to-patient staffing ratios directly improves patient outcomes including the measurements of decreased mortality, hospital readmission, and hospital length of stay rates (Rosenberg, 2021). Researchers found an association existed between high staffing level and improved quality of care. A significant relationship existed between the quality-of-care issues functional ability, pressure ulcers and weight loss impacted by staffing ratios (Bosticket al., 2006). Negative health outcomes including the prevalence of increased hip fractures were also the result of facilities staffing with fewer hours of direct nursing care (Zullo et al.,2018). Long term

care facilities received lower numbers of healthcare deficiencies for inappropriate psychotropic medications for residents with dementia that had higher nursing staffing levels (Yoon et al.,2022). The CMS Nursing Home Compare Five-Star Quality Rating System, also concluded a relationship existing between the number certified nursing assistants staffing and nursing home quality (Heyer et al.,2011).

Long term care employers are facing shortages of qualified nurses due to high nurse turnover, low retention rate, and shortages of qualified nurses (Bae, 2022). High turnover rates of nursing staff have historically plagued the long-term care industry. Identified reasons include low pay, high workloads, facility ownership, and the work environment (Gandhi et al.,2021). Staff turnover in long term care facilities was associated with the probability of an infection control citation (Loomer et al.,2022). A quantitative study indicating that nursing homes historically compensate staff at lower rates than other healthcare arenas, determined a significant relationship existed between hourly wages and turnover for CNAs (Sharma et al., 2022).

High workloads have also result in high nursing home turnover rates. Almost 75% of respondents in a cross-sectional survey data from caregivers in long-term evaluating the employee's perception on workload felt the workload was too high and could impact safety incidents (Buljac-Samardžić et al., 2018).

The nursing home ownership structure affects high staff turnover resulting in lower quality of care for long-term patients. CMS data on the ownership of U.S. skilled nursing facilities showed that 70% of nursing homes have for-profit ownership (Matays et al., 2023). For-profit and chain-owned facilities experience greater turnover rates than

not for profit ownership (Braun et al., 2021). These for-profit long-term care facilities scored lower in quality measures and staffing levels compared to nonprofit nursing homes. Clinically for-profit nursing homes had a higher rate of COVID-19 infections and deaths (Matays et al., 2023).

Residents are placed in long term care facilities that receive lower quality of care scores due to the patient's payer status, racial/ethnicity, and diagnosis. Research has shown that residents enrolled in both Medicare and Medicaid (dual enrollees)were found to be more likely placed in a low-quality 1–2-star nursing home than those not on Medicaid (Sharma et al., 2020). It is a concerning fact that despite the increased use of nursing homes by minority residents in the past decades, nursing home care is very segregated. Racial and ethnic minorities are more likely to be placed in long term care facilities that score lower in regard to clinical outcomes, suffer low nurse to patient staffing ratios and receive a high number of deficiency citations from regulatory enforcement (Li et al., 2015). A patient's diagnosis can also be a factor in placement in a long-term care setting. A cross-sectional analysis of Medicare beneficiaries hospitalized found that patients with Alzheimer's Dementia or a related diagnosis were more likely to be placed in a lower quality skilled nursing facilities than patients without this diagnosis (Kosar et al., 2023). The quality of care received in long-term care settings can also be attributed to the variables including staffing stability and resident acuity, impact of ancillary staff, legislative reform, and education or specialization of staff. Mandatory nursing staff ratios have been shown to increase patient quality of care in long-term care settings, but also can be a result of staffing stability. Studies have shown that average

staffing levels day-to-day results in nursing homes being able to provide a higher quality of care (Mukamel et al., 2022). Beyond the minimum levels, nursing homes administrators must also factor the care level of patients when assigning staffing levels(Harrington et al., 2020). Staffing should be based not only on the number of resident days, but according to the current resident needs (Zhang et al., 2013). Nursing home quality overall has improved recently due to the self-reported data of nursing homes (Sharma et al., 2019).

Ancillary staff members can also impact the quality of care received in long-term settings. Using the federal nursing home complaint data the impact of social services and activities staffing directly decreased the numbers of complaints. These same departments were also influential on the probability that they nursing home facility would even receive a complaint (Peterson et al., 2022). Improving overall deficiency outcomes when considering a cost efficiency approach was the increase in social services hours. Increasing social services and activities staff hours directly caused quality of life deficiencies to decrease (Bowblis & Roberts, 2020).

The overall environment of the nursing home affects the quality-of-care outcomes. Nursing units with strong safety climate and working conditions were associated with lower rates of falls (Alanazi et al., 2023). In addition, nursing units with a strong safety climate and better collaborations between nurses and other professionals, including physicians and pharmacists, were associated with lower incidents of patient falls (Alanazi et al., 2023).

Culture change models have been introduced to nursing homes with the goal of changing the environment from a health care institution to person-centered care facilities and improving the overall quality of care. Nursing homes that adopted the culture change model saw a 14.6 % decrease in survey deficiencies (Grabowski, 2014).

Legislative nursing home reform is another way to improve long-term care staffing and the quality of care by partnering with congressional representatives (Matays et al., 2023). An initiative to readjust the ratio of dollars that go to profit and those that go to direct patient care is seen as way to impact quality of care. The Biden Administration has also announced initiatives to improve nursing home quality and the safety of residents and staff by increasing direct car**e** registered nurse coverage (Matays et al., 2023). The ownership and affiliation of nursing homes in the past has been unavailable to the public. Nursing home financial transparency and accountability can assure the public that minimum staffing levels are occurring in U.S. nursing homes are needed to assure minimum staffing levels (Halifax & Harrington, 2023). Previous to legislative mandates and CMS disclosures, the public in general were unaware of facility ownership and affiliations. The public reporting of this data increases transparency and improves overall quality indicators by holding nursing homes accountable (deCordova, 2021).

The education level and clinical specialization of long-term care staff can contribute to the quality-of-care patients received. Nurses with a bachelor's degree or higher has been shown to result in long-term care patients with lower incidence rates of pressure ulcers. Improving the health outcomes of residents in nursing homes requires not only an increase in the nursing workforce but educational levels (Choi et al., 2021).

Clinician specialization in professionals working in nursing home care resulted in the improvement of 2 of 6 identified quality of care measures. The category of nursing home specialists included general physicians or advanced practitioners (Ryskina et al., 2019).

The long-term care ombudsman whom advocate for the rights and wishes of residents and tenants who live in nursing homes, assisted living programs, residential care facilities and elder group homes plays a role in the survey process in some states. States involvement of the ombudsman can range from 0.8%-82.0%. As their involvement increases, the health survey deficiencies also increase in quality of life and administrative categories (Berish et al., 2019). Reasons for increased citations could be due to the ombudsmen identification of issues to the surveyors (Berish et al., 2019).

Weaknesses of previous research include failure to identify the negative effects of mandatory staffing ratios. The quality of care can be negatively impacted by mandated staffing ratios and high turnover rates. Although some states have staffing mandates in place, when staffing is short, ratios go up to meet the patient need forcing increased workloads (Haddad et al., 2023). 75 % of U.S. nursing homes have been found to be noncompliant with CMS staffing expectations based on residents' level of care needs (Harrington et al., 2022).

Not all research supports the significance between staffing ratios with quality-of-care issues. The Donabedian's model of structure, process and outcome in a study determined there was no correlation between higher nursing staff ratios and decreased fall rates (Okeorji, 2017).Among fee-for-service Medicare beneficiaries discharged to a SNF after an acute care hospitalization, available performance measures were not consistently

associated with differences in the risk of readmission or death (Neuman et al., 2014). Although a causal relationship likely exists between low RN staffing and harm to patients, no consistent relationship was found between nurse staffing and quality of care on a national level (Backhaus et al., 2014). Studies conducted in the United States typically have found a relationship between the quantity of staff and quality of care measures. Studies outside of the United States did not find an association between the two factors (Backhaus et al., 2018). Increasing RN staffing levels and skill mix are one of a variety of approaches to improve nursing home care (Jutkowitz et al., 2023). The literature review supports relationship between quality of care and staffing levels. Additional staffing categories directly affected patient quality of care outcomes. Increasing registered nurses staffing levels can be associated with fewer pressure ulcers, lower hospitalizations rates, and urinary tract infections. There are minimal studies evaluating the total nursing and personal care hours and the effects specific categories or classes of nursing staff outcomes (Clemens et al., 2021).

The utilization of the CMS 5 Star Rating System is an appropriate measurement for quality-of-care indicators as evident by numerous previous research identifying staffing ratios as a key variable directly impacting nursing home quality. Facilities with the lowest one-star rating (worst rating) from CMS had median turnover of 135.3%, while the five-star rating (best rating) facilities had turnover of 76.7% (Gandhi, 2021).A cross-sectional study found that a facilities staffing rating is a significant predictor for rehospitalization rates and emergency room visits for short term stay residents (Min, et.al, 2019). A cross-sectional study in Switzerland evaluating six quality indicators in long

term care facilities amongst four clinical categories. The study found that identified four clinical domains were quality indicators that could determine the level of quality of care provided in each nursing home (Favez et al., 2020). The federal Nursing Home Compare website utilized payroll-based data to determine that facilities often engaged in daily staffing fluctuations, low weekend staffing, and daily staffing levels often below the expectations of the CMS (Geng et al., 2019).Overall, the reported percent of nursing home residents suffering adverse outcomes decreased dramatically since Nursing Home Compare began reporting them (Konetzka et al., 2022).Research is lacking on the independent variable of mandatory staffing ratios and the independent variable of survey ratings in CMS Region 7 consisting of Iowa, Kansas, Missouri, and Nebraska. This study's research questions seek to answer if there is a correlation between minimum staffing ratios and quality of care and/or are quality of care scores in LTC settings higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7. A strong positive relationship between the number of direct care workers and quality of care and quality of life of residents (Harrington et al., 2020).

Definitions

5 Star Rating: CMS created the Five-Star Quality Rating System to help consumers, their families, and caregivers compare a quality rating system that gives each nursing home a rating of between 1 and 5 stars. Nursing homes with 5 stars are considered to have much above average quality and nursing homes with 1 star are considered to have quality much below average. Nursing homes are rated on an overall 5-

star rating and separate ratings for health inspections, staffing and quality measures (U.S. Centers for Medicare and Medicaid Services, n.d.)

CMS: The Centers for Medicare and Medicaid Services, CMS, is part of the Department of Health and Human Services. CMS ensures compliance with federal regulatory standards for healthcare organizations including nursing homes. The goal of these programs is to ensure quality care and patient safety. By complying with the standards set by the organizations, there is greater consistency of care, better processes for patient and staff safety, and thus higher quality of care (U.S. Centers for Medicare and Medicaid Services, n.d.)

Complaint Survey: Complaints submitted by residents, their families, or ombudsmen or other third parties (U.S. Centers for Medicare and Medicaid Services, n.d.)

Health Deficiencies: A list of nursing home health citations in the last three years, including the nursing home that received the citation, the associated inspection date, citation tag number and description, scope and severity, the current status of the citation and the correction date (U.S. Centers for Medicare and Medicaid Services, n.d.)

Long term care: ongoing inpatient services to meet health or personal care needs of a patient typically age 65 or older (Heiks et al., 2022).

Licensed nursing home: A nursing home is licensed if it complies with state regulations that are necessary to operate in a state (U.S. Centers for Medicare and Medicaid Services, n.d.)

Nurse-to-patient ratio: the number of nurses or midwives working on a particular ward, unit, or department, in relation to the number of patients they care for (U.S. Centers for Medicare and Medicaid Services, n.d.)

Skilled facility: a skilled nursing facility provides inpatient skilled nursing services such as physical, occupational and speech therapy to patients in aMedicare certified facility until they are able to be discharged to their prior living arrangement or a licensed nursing home. Many nursing homes are Medicare certified to provide these services (Heiks et al.,2022).

Assumptions

Assumptions consist of testing theories, building in protections against bias, controlling for alternative or counterfactual explanations, and generalizing and replicating findings (Creswell, 2018).Assumptions in this study included nursing homes not licensed by their prospective states were not included in this study. All nursing homes included in the study are approved Medicare and Medicaid facilities located in the United States.

Scope and Delimitations

The scope of this study determined if there is an association between minimum staffing ratios and quality of care received in long-term care settings in the states of Iowa, Kansas, Missouri, and Nebraska last updated June 1, 2023 and released on June 28, 2023. The service dates for the survey include the health inspection during the three most recent annual standard inspections, as well as on substantiated findings from complaint investigations during the most recent 36 months (U.S. Centers for Medicare and

Medicaid Services, n.d.). This study can be generalized and used to evaluate the care received at long-term care facilities in the United States.

Limitations

Addressing the research questions in this quantitative study was done first with the Spearman's Rank Correlation to evaluate relationships involving ordinal variables. Limitations of correlations are the inability to look at the presence or effect of other variables outside of the two being explored and the correlation does not tell us about cause and effect. The Mann-Whitney U test is a rank-based nonparametric test that can be used to determine if there are differences between two groups on a continuous or ordinal dependent variable. Limitations include that the Mann-Whitney U test does not explain why there is a difference (Hart, 2001).

Information bias that could affect the study outcomes could offer during the collection, handling, or analysis of data in a research study, survey, or an experiment. To prevent this from happening the information will be downloaded directly from the website without any manipulation from the researcher.

Significance

Potential contributions of this study that advance knowledge in the discipline is addressing the concern of lower quality of care outcomes in long term care settings. Healthcare administrators will be able to use the study for decision making purposes of identifying staffing needs in long-term care. The implications for positive social change from the scope of this study is significant in that adds to the growing body of knowledge

that minimum staffing ratios effect the quality-of-care indicators in long term care settings through the comparison of overall star ratings per state.

Summary and Conclusion

The quality of care received by nursing home patients has been a concern of patients, families, and regulators since the inception of long-term care facilities. Minimum nurse-to-patient staffing ratios lead to improvements in mortality, readmissions, and length of stay (Rosenberg, 2021). Although researchers have investigated this issue, there is very little or no literature on comparing 4 US states (HHS *Region 7*- Iowa, Kansas, Missouri, and Nebraska) that require mandatory staff ratios, the various levels of staffing ratios, with those without a mandatory staffing ratio.

Section 2: Research Design and Data Collection

The purpose of this quantitative research study was to determine if there was an association between quality-of-care ratings in long-term care facilities and minimum staffing ratios in Iowa, Kansas, Missouri, and Nebraska. The research design and data collection sections include the introduction, research design and rationale, methodology, threats to validity and summary.

Research and Design Rationale

In this study the independent variable is mandatory staffing ratios and the dependent variable is CMS survey ratings used for determining the quality of care. A quantitative correlations research design was used to determine if that is a statistical relationship and prevalence exists between the two variables. There are no identified time or resource constraints with the design choice. Utilizing a quantitative correlations research design was consistent with designs needed to advance knowledge in the healthcare administration discipline because of the Donabedian model. The three components are structure, process, and outcomes (Donabedian, 1988).

Methodology

The target population for this study was licensed nursing homes in Iowa, Kansas, Missouri, and Nebraska totaling 1,458 nursing homes (Total number of Certified Nursing Facilities, 2022). The total number of residents in these four states totals 59,972 (Total number of residents in Certified Nursing Facilities, 2022). The sampling strategy utilized was non-probability sampling because the samples are selected by nonrandom methods. This method was chosen to allow all nursing homes in the four identified states to be

included instead of randomly selecting them. The research used secondary data collection will be presented in a quantitative method that allows for expression in number and graphs that is analyzed through statistical methods. The inclusion criteria for this study will be that the entity is a licensed nursing home facility located in Iowa, Kansas, Missouri and/or Nebraska last updated June 1, 2023 and released on June 28, 2023. The service dates for the survey include the health inspection during the three most recent annual standard inspections, as well as on substantiated findings from complaint investigations during the most recent 36 months (U.S. Centers for Medicare and Medicaid Services, n.d.). Exclusion criteria included if the entity is not licensed in the state of Iowa, Kansas, Missouri and/or Nebraska and/or geographically outside of these four states.

The procedure to collect data was secondary by CMS and analyzed by this researcher. Access to the dataset was through the CMS Nursing Home Compare website. There are no needed permissions to gain access to the data as it's available to the public. The purpose of the CMS Nursing Home Compare website is to provide current data to the public on the quality indicator performance of licensed nursing homes. CMS is the regulatory body for this industry (U.S. Centers for Medicare and Medicaid Services, n.d.).

The tool used to calculate sample size, compute effect sizes and to display graphically the results of power analyses was the software G*Power. The effect size is the actual difference between two groups or the strength of the association between variables. Alpha is the probability of concluding there is an effect when there is not one (Kang,

2021). This was set at .05 to indicate a significant effect. Power is the probability that the null hypothesis will be correctly rejected and will be set at .80.The sample size could be a total of 196 nursing home facilities. However, the full population size of1,395 nursing homes was used because the data were available and the results are more accurate than a sample size.

The operational definition of the independent variable mandatory staffing ratios is the number of patients in a skilled nursing home compared to the number of nursing staff. The operational definition of the dependent variable CMS survey ratings used for determining the quality of care include overall rating with 1 being the lowest and 5 being the highest (U.S. Centers for Medicare and Medicaid Services, n.d.)

SPSS 29.0 was used for the data analysis. Techniques that were used for data cleaning in SPSS include identifying and removing duplicate cases, flag variables containing excessive missing data, identify extreme values and anomalous cases, establish rules to check for out of range values or illogical relationship and quality update and change variable and value labels.

RQ1: Is there a correlation between minimum staffing ratios and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska)? CMS Region 7 consists of these four states with comparable number of nursing homes in each state.

$H_0$1: There is no statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

H_a1: There is a statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

RQ2: Are quality of care scores in LTC settings higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska)?

$H_0 2$: There is no statistically significant association between quality of care in LTC settings and minimum staffing ratios among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

$H_a 2$: There is a statistically significant association between quality of care in LTC settings and minimum staffing ratios among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska).

Spearman's Rank Correlation was used for RQ1 to understand the correlation between the independent variable and each of the dependent variables (Frankfort-Nachmias et al., 2020).To address the second research question in this quantitative study, a Mann-Whitney U test was used (Frankfort-Nahmias et al., 2020).

Threats to Validity

The variables for this study include the independent variable of mandatory staffing ratios and the dependent variable is CMS survey ratings used for determining the quality of care. The operational definition for mandatory staffing ratios measured as 0 hours per patient per day and 2.4-2.99 hours per patient per day. The operational

definition of how to measure the dependent variables are a star rating between 1 and 5, with 5 being optimal (U.S. Centers for Medicare and Medicaid Services, n.d.).

The secondary data set was retrieved through the Centers for Medicare and Medicaid Services website that is available to the general public. No permission is needed to access the dataset. The facility data retrieved will not allow human participant identifications. Therefore, the major ethical issues when conducting research including informed consent, beneficence, respect for anonymity and confidentiality and respect for privacy are not a factor. Approval prior to performing the data analysis was received through Walden's IRB process 07-13-23-0649718.

In full disclosure, I work in the field of long-term care in one of the chosen states for the research study.

Summary

A quantitative correlations research design was used to determine if that is a statistical relationship and prevalence exists between the two variables. Section 3 includes data collection of secondary data sets, results, and a summary.

Section 3: Presentation of the Results and Findings Section

The purpose of this quantitative study was a comparison between the independent variable mandatory staffing ratios and the dependent variable of CMS survey ratings used for determining the quality of care in CMS Region 7 (Iowa, Kansas, Missouri, and Nebraska). Research question one evaluated if there was a correlation between minimum staffing ratios and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska). CMS Region 7 consists of these four states with comparable number of nursing homes in each state.

The second research question asks if quality of care scores in long term care settings are higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska). Section 3 will include data collection of secondary data set, results, and summary.

Data Collection of Secondary Data Set

The dataset from CMS contains general information on currently active nursing homes, including the number of certified beds, quality measure scores, staffing, and other information used in the Five-Star Rating System. The timeframe for the data set was updated June 1, 2023 and released on June 28, 2023 by CMS. Baseline descriptive and demographic characteristics as seen in Table 2 includes the total number of nursing homes dually licensed by Medicare and Medicaid in each of the four states Iowa, Kansas, Missouri, and Nebraska.A total of 1,395 number homes were included in the data set as shown in Table 3.The sampling strategy that was used was non-probability to allow all nursing homes in the four identified states to be included.

Table 2

Baseline Characteristics

States	Number of nursing homes
Iowa	410
Kansas	310
Missouri	492
Nebraska	183

Note: (U.S. Centers for Medicare and Medicaid Services, n.d.)

The Results

The results section includes descriptive statistics, evaluate statistical assumptions as appropriate to the study and report statistical analysis findings. Descriptive statistics that appropriately characterize the sample are measurements of the center including minimum, maximum, and mean.

Table 3

Descriptive Statistics

State	N	Minimum	Maximum	Mean	Std. deviation
Iowa	410	1	5	2.92	1.466
Kansas	310	1	5	2.83	1.444
Missouri	492	1	5	2.51	1.354
Nebraska	183	1	5	3.13	1.486

Note: IBM SPSS Statistics (Version 29).

Table 4shows the total number of facilities in Iowa and Kansas at 720 is comparative to Missouri and Nebraska, which has a total of 675. Table 5 revealed that the 5-star ratings for each state varied drastically with Iowa receiving 87 and Nebraska at 45. Nursing homes in each state can receive a rating between 5 (highest) and 1 (lowest) during each survey.

Table 4

Star Ratings for Overall Quality

Ratings	Iowa	Kansas	Missouri	Nebraska
5	87	56	55	45
4	65	54	68	23
3	82	55	100	17
2	75	65	111	20
1	97	76	156	30

Note: IBM SPSS Statistics (Version 29).

Research Question 1 evaluated if there was a correlation between minimum staffing ratios and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska). A Spearman's Rank Correlation coefficient, r_s, was between .919 and 1.0 in Table 5 and is statistically significant (p =<.001). There is a positive correlation between minimum staffing ratios and quality of care ratings. Therefore, the null hypothesis that there is no statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 would be rejected (Iowa, Kansas, Missouri, and Nebraska). The alternative hypothesis that there is a statistically significant correlation between states with minimum staffing levels and

quality of care in LTCs among the four states in Health and Human Service Region 7 would be accepted (Iowa, Kansas, Missouri, and Nebraska).

Table 5

Spearman's Correlation

States	IA	KS	MO	NE
Iowa	1.00	.963	.955	.919
Kansas	.963	1.00	.964	.940
Missouri	.955	.964	1.0	.930
Nebraska	.919	.940	.930	1.0

Note: IBM SPSS Statistics (Version 29).

Research Question 2 was conducted using the Mann-Whitney U test to see if there is a statistically significant difference between the two groups of states (Iowa and Kansas vs. Nebraska & Missouri) and the ordinal value of quality-of-care scores being higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska). There are no significant differences between the groups of no requirements for staffing and 2-hour requirement for staffing. Table 6 indicates the Mann-Whitney U test $p = .291$, which means that the result is not statistically significant therefore accepting the null hypothesis as there is no statistically significant association between quality of care in LTC settings and minimum staffing ratios among the four states in Health and Human Service Region 7. The alternative hypothesis that there is a statistically significant association between quality of care in LTC settings and minimum staffing ratios among the four states in Health and

Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska) will be rejected. The Hypothesis Test Summary shown in Table 7 for Research Question 2 had a significance of .291 and the decision to retain the null hypothesis.

Table 6

Mann-Whitney U

Total N	1243
Mann-Whitney U	183085.000
Asymptotic Sig. (2-sided test)	.291

Note: IBM SPSS Statistics (Version 29).

Table 7

Hypothesis Test Summary

Null hypothesis	Test	Sig.	Decision
The distribution of Quality Score is the same across categories of staffing.	Independent Samples Mann Whitney U Test	.291	Retain the null hypothesis

Note: IBM SPSS Statistics (Version 29).

Summary

Research Question 1revealed there is a positive correlation between minimum staffing ratios and quality of care ratings. The second research question regarding if

quality of care scores in LTC settings are higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska) resulted in no significance. Section 4 will include the application to professional practice and implications for social change, an introduction, interpretation of the findings, limitations of the study, recommendations, implications for professional practice and social change and conclusion.

Section 4: Application to Professional Practice and Implications for Social Change

The purpose of this quantitative study was to determine if there is an association between the independent variable of mandatory staffing ratios and the dependent variable of CMS survey ratings used for determining the quality of care in CMS Region 7 consisting of Iowa, Kansas, Missouri, and Nebraska. This study was conducted due to the poor outcomes received by patients in long term care settings. Key findings of the study included a Spearman's Rank Correlation to analyze the data of the relationship between minimum staffing ratios and quality of care. Correlation coefficient, r_s, was between .919 and 1.0 in Table and is statistically significant (p =<.001). There is a positive correlation between minimum staffing ratios and quality of care ratings. Therefore, the null hypothesis that there is no statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska) would be rejected. The alternative hypothesis that there is a statistically significant correlation between states with minimum staffing levels and quality of care in LTCs among the four states in Health and Human Service Region 7 would be accepted (Iowa, Kansas, Missouri, and Nebraska).The second research question regarding if quality of care scores in LTC settings are higher due to the result of minimum staffing levels among the four states in Health and Human Service Region 7 (Iowa, Kansas, Missouri, and Nebraska) resulted in no significance.

Interpretation of the Findings

Studying the effects of mandatory staffing ratios on patients in long term care settings identified a statistically significant correlation between minimum staffing ratios and quality of care, but not that the quality-of-care scores were higher due to minimum staffing ratios. A review of the literature identified the association of minimum staffing ratios and higher quality of care for patients in long term care settings. Insufficient nursing staff can negatively impact all residents in a nursing home. The negative consequences of staffing U.S. nursing homes below the required levels has been known by professionals for decades (Harrington et al., 2020). Rosenberg's quantitative cross-sectional study focusing on the effects of nursing staffing ratios and the quality of care received in long-term settingssupportingstatistical analysis that mandated higher minimum nurse-to-patient staffing ratios directly improves patient outcomes including the measurements of decreased mortality, hospital readmission, and hospital length of stay rates (Rosenberg, 2021). Facilities with residents diagnosed with dementia were prescribed appropriate psychotropic medication with higher staffing levels of RNs and certified nursing assistants (Yoon et al., 2022). A significant relationship exists between the quality-of-care issues functional ability, pressure ulcers and weight loss impacted by staffing ratios through a quantitative study identified the association between higher total staffing levels and improved quality of care (Bostick et al., 2006). Additionally, a significant relationship between high turnover and poor resident outcomes was established. The level of staffing at a nursing home facility can directly impacting a patient's activities of daily living needs, acquirement of pressure ulcers and significant

weight loss (Bostick et al., 2006). A strong positive relationship between the number of nursing home staff who provide direct care to residents on a daily basis and the quality of care and quality of life of residents (Harrington et al., 2020). Quantitative research of licensed nursing homes in Florida determined that when the staffing levels of certified nursing aides increased the facility received less deficiencies (Hyer et al., 2011). Negative health outcomes including the prevalence of increased hip fractures were also the result of facilities staffing with fewer hours of direct nursing care (Zullo et al., 2018).

The CMS Nursing Home Compare Five-Star Quality Rating System also concluded a relationship existing between the number certified nursing assistants staffing and nursing home quality (Heyer et al., 2011). The number of RNs staffed in at a facility directly corresponded to patient mortality rates. The overall CMS quality of care rating increased when the number of RNs increased. Legislative proposals for RN staffing levels can strengthen the nursing home workforce (Cho et al., 2020).

Nursing home staffing levels have received a lot of attention recently due to the COVID-19 pandemic. Nursing homes experiencing severe COVID-19 outbreaks correlated to staffing challenges during and after outbreaks. The high rate of negative outcomes during this timeframe includes deaths resulting in political advocacy to established mandated staffing ratios during and after infectious disease outbreaks (Shen et al., 2022). Average nurse staffing levels (for RNs, LVN/LPNs, and NAs) in nursing homes are too low in some facilities to provide high quality of care and require increased standards to improving the quality of the nation's nursing home care (Harrington et al., 2000).

Non-nursing departments also had an impact on improving quality in long term care settings. A cost-effective way to improve a facility's deficiencies was through the additional of social services hours. As a result of increased hours in administrative nursing and social services staff quality of care issues can be effectively addressed resulting in less deficiencies (Bowblis & Roberts, 2020).

Donabedian's idea that quality can be measured by structures, processes and outcomes is one of the most used in healthcare. Structural measures are identified as organizational characteristics associated with the provision of care. These are easy to measure and routinely available. Nursing homes can meet structural quality measures, but not necessarily improve the quality-of-care patients receive. Process measures are characteristics of things done for and to a resident, again are easy to interpret, but criticized for measuring documentation requirements vs. patient care. Lastly, outcome measures are the goals to work towards and can be an unfair measure of quality due to factors unrelated to the care provided to a patient. Nursing homes use several quality indicators for measurement including the Nursing Home Compare and Advancing Excellence campaign website. Quality indicators designed on a national scale such as the previously mentioned allow for comparison (Castle & Ferguson, 2010). Quality indicators revealed from structural, process, and outcome measures identify that although nursing home overall quality has seen improvements, but additional work is still needed (Castle & Ferguson, 2010).

Research findings from a quantitative Swedish survey, utilizing Donabedian's model, determined staffing was the only quality of care structural variable that impacted

quality of care indicators (Kajonius & Kazemi, 2016).Process variables accounted for 40% and 48% of the variance in satisfaction with care, which was more than the structural variables. This study is supportive of a continued quality improvement in elderly care with focus on process variables (Kajonius & Kazemi, 2016).

The findings of this study regarding the impact of staffing ratios on the industry of long- term care is significant to meet the primary goal of long-term care. All operations hinge on the idea of enhancing the quality of life for residents by providing a safe and comfortable environment, promoting socialization and engagement, and addressing the physical, emotional, and spiritual needs of residents.

Limitations of the Study

Limitations of this study are concerns with the overall survey process including timing of surveys, accuracy of self- reported data, recertification's and compliant investigations, staffing shortages, and comparability with CMS's 10 regions.

Every state requires a type of nursing home inspections for the facilities it licenses and oversees. CMS requires state nursing home agencies to conduct a full inspection of licensed care facilities no later than 15.9 months and on average within 12.9 months from their last survey (CMS, n.d.). Federal data indicates that at least 28% of nursing homes have not received an annual survey for more than 16 months as of May 2023. One reason for the delays was the additional prioritized survey requirements for overall infection control prompted by the COVID-19 pandemic (Stevenson & Cheng, 2021). The lack of annual survey data during this timeframe limits the comparability of the survey data.

CMS continues to rely on facility self-reported data submitted through the MDS process and auditable payroll-based staffing and resident census data quarterly that provide snapshots of both the daily total number of nursing home residents and hours of staffing. CMS temporarily suspended reporting requirements for the PBJ system for the first quarter of 2020 (Werner & Coe, 2020). Although the PBJ system reports are hours for all direct care staff including both employed and contract, RNs, licensed practical nurses, and certified nursing assistants' hours are also included for paid sick leave and non-direct care nurses or those doing administrative work (Werner & Coe, 2020).

The Centers for Medicare & Medicaid Services' Five-Star Quality Rating System combines results from nursing home recertification surveys and complaint investigations into a single indicator for health inspections. This rating is based on regulatory deficiencies issued during the most recent three on-site recertification surveys and all complaint investigations for prior 36 months (Peterson et al., 2022).Overall health inspection star ratings may be affected by recertification survey results and may mask the results of complaint investigations.

Table8

Survey Citations Comparison

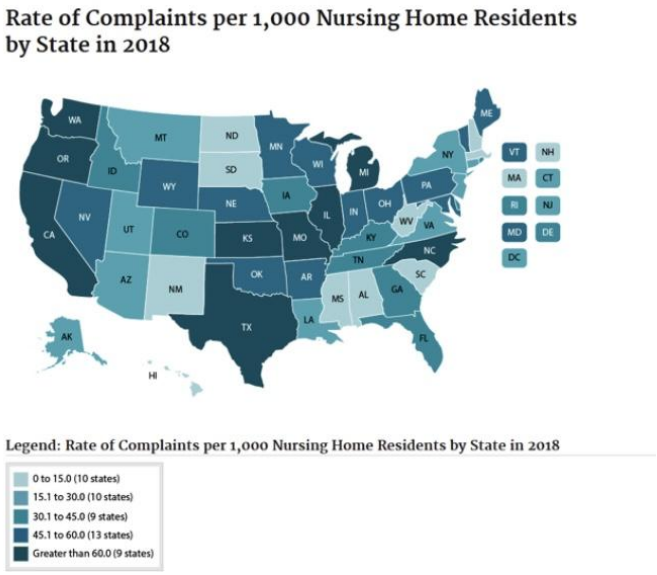
National average	8.9
Iowa	8.2
Kansas	8.7
Missouri	11.8
Nebraska	7.1
South Dakota	2.9
Maryland	15.4

Note: (CMS, n.d.)

The number of complaint surveys vary from state to state and by CMS region limiting the ability to compare states. Table 8 shows the variation from an average of 2.9 in South Dakota located in CMS Region 8 to 15.4 in Maryland, CMS Region 3. Figure 3 demonstrates the variation in complaint comparisons of residents by state with Missouri having more than 60.9 per 1,000 per nursing home residents.

Figure 3

Complaint Comparison of Residents by State



Source: OIG analysis of ACTS data, 2019.

The overall nursing home staffing shortage directly effects the facilities survey performance. Staffing shortages in U.S. nursing homes during the COVID-19 pandemic have resulted in an overall 13.3% decrease in the workforce.Currently2% of U.S. nursing homesacknowledge being fully staffed in 2022 (Brazier et al., 2023).

Data for this study were collected after the COVID-19 pandemic and may not be as complete as information prior to the pandemic. The majority of LTC facilities continue to witness record-low census levels compared to pre-COVID-19 data sets (CMS, n.d.). Average nursing home resident census began to decline in March 2020 that resulted by September 2020 in 10. 5 % decrease in occupancy (Werner & Coe, 2020).

Limitations of this study include that a specific timeframe was chosen to analyze the data. CMS releases new data on a monthly basis and is available starting in 2008.

Other limitations were the inclusion only of CMS Region 7 states consisting of Iowa, Kansas, Missouri, and Nebraska. The applicability from this study may not be available to other states or data-collection timeframes.

Recommendations

Further research to strengthen this study and evaluate the effects of quality indicators in the long-term care industry would be to compare the four states in this study at different timeframes and/or with additional states. This study only evaluated CMS data last updated June 1, 2023 and released on June 28, 2023. CMS datasets are released monthly and available dating back to 2008. The states compared included those without minimum staffing ratios and those that required 2.2 hours per patient per day. A more comprehensive study could include states representative of each of the six different staffing category requirements.

Implications for Professional Practice and Social Change

The long-term care profession can use this study for professional practice and social change benefiting patients residing in long term care settings. The methodological implications found that research has supported the correlation between minimum staffing ratios in long term care facilities and quality of care outcomes specifically there is a positive correlation, but it is not statically significant. The potential impact of this study for positive social change is at the individual, organizational and policy levels. Individual patients and organizations (nursing home facilities) can benefit from the recognition of providers regarding association of minimum staffing ratios impacting quality of care that is delivered in long term care facilities. Policy implements can be further established and

implemented after additional research is conducted to determine the minimum staffing standards that should be nationally adhered to. Overall, the potential impact for social change to provide a higher level of quality of care for long term care patients in the United States.

Conclusion

This study supports previous research that a statistically significant correlation between minimum staffing ratios and quality of care exists, however the quality-of-care scores were not higher due to minimum staffing ratios. Further research including additional states and survey dates can increase the data to establish specific staffing guidelines in long term care facilities nationwide. By understanding the importance of staffing ratios in long term care facilities, patients and families will experience a higher quality of care and improved satisfaction, thus creating positive social change.

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