


# Determinants of Successful Nursing Home Accreditation

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## Abstract

**Objectives:** This study examined the factors associated with better accreditation outcomes among nursing homes. **Method:** A total of 538 nursing homes in Taiwan were included in this study. Measures included accreditation scores, external factors (household income, Herfindahl–Hirschman Index, old-age dependency ratio, population density, and number of older adult households), organizational factors (hospital-based status, chain-affiliated status, occupancy rate, the number of registered nurses or nurse aides per bed, and bed size), and internal factors (accountability, deficiencies, person-centered care, nursing skills, quality control, and integrated care). **Results:** Bed size, hospital-based status, accountability, deficiencies, person-centered care, nursing skills, quality control, and integrated care were found to predict accreditation. **Conclusion:** Among all variables in this study, the quality indicators contributed to the most variation, followed by organizational factors. External environmental factors played a minor role in predicting accreditation. A focus on quality of care would benefit not only the residents of a nursing home but also facilitate its accreditation.

## Keywords

nursing home, accreditation, long-term care, quality indicators, elderly people, structure-process-outcome

## Highlights

1. What do we already know about this topic?  
Accreditation is an approach to assess nursing homes.
2. How does your research contribute to the field?  
This study has investigated the determinants of receiving accreditation with a holistic view.
3. What are your research's implications toward theory, practice, or policy?  
Providing incentives on internal factors may improve outcome-quality and accreditation.

## Introduction

An increasing number of older adults are living with chronic diseases and disabling conditions. These populations require different levels of well-coordinated, highly technical, empathetic long-term care, of which institutional care is a common type. Accreditation, in which external reviewers evaluate indicators of structure and process quality, is essential for the continuous improvement of healthcare services. From a government viewpoint, accreditation can compare nursing homes'

processes and procedures against accepted good practice. From care providers' perspective, accreditation leads to a better public image and helps potential users to better understand their services.

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Numerous countries have legislative principles for adequate care. Moreover, in countries such as Germany, England, and France, care facilities must be accredited or certified to operate. In Germany, nursing homes are assessed by the statutory long-term care insurance Medical Review Boards.<sup>1</sup> The quality assessments are published in transparency reports.<sup>2</sup> Alternatively, in England, all health and social care services are regulated by Care Quality Commission (CQC) which is an executive non-departmental public body sponsored by the Department of Health and Social Care, United Kingdom.<sup>3</sup> To maintain adequate care, the CQC inspects and rates qualities of residential care homes and nursing homes. Unqualified units receive notices or warnings requiring improvement. Providers may even face fines or prosecution if the failing was serious or harm for residents.<sup>4</sup> Similarly, nursing homes in France may have to close down if accreditation results are bad.<sup>5</sup> In Japan, United States, and Korea, governments use payment incentives to encourage improved outcomes. Providers are entitled for financial rewards for well rehabilitation of long-term care recipients, discharge to home, and improvement in functions.<sup>6</sup> In summary, quality assessments of nursing homes are central in ensuring and maintaining a certain level of quality. Passing accreditations can therefore be associated with good reputation of the organization.

However, the evidence base for accreditation remains incomplete. Studies examining factors associated with accreditation success have indicated that accreditation scores comprise various dimensions, including care quality and standards for staffing and safety. A study on nursing homes in England after the adoption of a new rating system in 2017 reported that better ratings were associated with higher resident quality of life.<sup>7</sup> A similar accreditation system in the Netherlands called the Health Care Inspectorate acts as an inducement or incentive for actual compliance. According to Vermeulen et al. (2017),<sup>8</sup> daily supervision in nursing homes can effectively reduce medication errors and increase willingness to report incidents. A study demonstrated that Germany's compulsory quality management system for nursing homes can help improve communication and transparency.<sup>9</sup>

The literature on the links between healthcare organization accreditation and structure, process, and outcome indicators is inconclusive—some studies are in favor of accreditation, whereas others are not.<sup>10</sup> Although several studies have explored factors associated with accreditation, relatively few have investigated the determinants of receiving accreditation with a holistic view. This study therefore aims to provide a comprehensive comparison of the external, organizational, and internal factors most closely associated with variations in accreditation scores.

## Literature Review

### Context

In 2019, older adults (defined as individuals aged 65 years or over) in Taiwan accounted for 15.28% of the total population.<sup>11</sup> Of these individuals, 13% require assistance in at

least one kind of activities of daily living.<sup>12</sup> Among older patients in long-term care, 85.8% reside at home, whereas the remaining 14.2% stay in nursing homes.<sup>13</sup> For quality assurance, nursing homes in Taiwan must reapply for accreditation every 1-4 years, depending on the years of accreditation granted—that is, the longer the period, the better the degree of compliance. The accreditation process awards a final score, denoting the degree of compliance with the standards.

The main purpose of accreditation, which in Taiwan offers no financial incentive, is to encourage nursing homes to improve their performance. As Scrivens (1997) noted,<sup>10</sup> accreditation alone may not be sufficient to promote or guarantee high quality of care because care providers may place more attention to safety issues and standardizing practice.

### External Factors

Amidst a dynamic, uncertain environment, nursing homes must rely on stable resources to assure their own survival.<sup>14</sup> Environmental and organizational characteristics affect dependency on resources and further alter the needs and capabilities of the organization. Exchanging resources, maintaining a good relationship with other organizations, and complying with government regulations on accreditation facilitate the acquisition of stable resources<sup>14</sup> and adaptation to environmental changes.

The residents are the definitive source of revenue for nursing homes. When a given market environment has adequate resources and additional resources can be obtained with high certainty, it is less constrained by requirements or regulations and vice versa.<sup>15</sup> Studies have reported that nursing homes located in areas with higher family or per capita incomes had better financial performance and provided better quality care.<sup>16,17</sup> Conversely, those located in disadvantaged areas with lower socioeconomic status had relatively lower overall staffing and quality scores on a 5-star rating system.<sup>18</sup>

The degree of market competition influences resource stability and further affects the degree of compliance with external organizations. The Herfindahl-Hirschman Index (HHI) is commonly used to measure market concentration and competitiveness.<sup>16</sup> When nursing homes are highly concentrated in a market, they must adopt innovative services to increase their power to acquire stable and sufficient resources, reduce uncertainty,<sup>19</sup> and maintain their competitive advantage.<sup>15</sup> These processes also contribute to improved performance. The higher the market concentration of a nursing home, the higher its quality of care.<sup>20,21</sup> For example, rates of catheter use, body restriction, and lack of toileting were lower in such facilities.<sup>22</sup> Conversely, Yuan et al.<sup>18</sup> noted that nursing homes located in an area with high market demand—such as one with a high proportion or population of older adults—and low competition had relatively lower quality scores.

Market forces, such as competition between providers, are generally considered to improve care quality. However,

according to Forder and Allan,<sup>23</sup> competition between providers actually leads to reductions in fees paid by the public sector, which in turn drives down quality. Other studies have demonstrated that high competition is associated with nursing home closure<sup>24</sup> and lower quality care, as measured by successful discharge rates.<sup>17</sup> These findings demonstrate that competition plays a crucial role in how nursing homes respond to environmental factors. Successful accreditation helps build a better image for the facility, which in turn increases demand.

### **Organizational Factors**

Organizational characteristics affect the ability of a care facility to obtain resources and provide services. Larger size and chain affiliation are associated with greater access to resources and flexibility in their allocation. These are in turn associated with a higher likelihood that specialty or higher quality care will be provided<sup>15,25</sup> and that the facility is accredited.<sup>26</sup> However, a study in England found that the size of care homes could not predict whether a care home is rated as outstanding or good by the Care Quality Commission.<sup>7</sup>

A benefit enjoyed by chain-affiliated facilities is the rationalization of tangible, intangible, and human resources. Specifically, the fact that all the facilities belong to the same system means that pooled resources, such as training programs, advertising campaigns, information systems, and consortium purchasing, can be shared. Moreover, the sharing of knowledge and work experience among healthcare professionals and managers in chain-affiliated facilities increases quality of care and facilitates the dissemination and adoption of innovative clinical practices across the chain.<sup>27</sup> In addition, lower operating costs<sup>28</sup> and profit maximization<sup>29</sup> have been reported among chain-affiliated facilities.

Registered nurses and nurse aides constitute the primary workforce in nursing homes, which crucially contributes to its capacity to provide high-quality care. Sufficient staffing of registered nurses reduces the likelihood of adverse outcomes in residents<sup>30</sup> and corresponds to better quality care,<sup>26</sup> especially with regard to functional ability, prevalence of pressure ulcers, and weight loss.<sup>31</sup> In a similar vein, high turnover rates of nurse aides in nursing homes has been demonstrated to be associated with higher rates of pressure ulcers and urinary tract infections among residents.<sup>32–34</sup> Sufficient nurse staffing has also been reported to be associated with better outcomes, such as lower rates of mortality and readmission to acute care hospitals,<sup>32</sup> smaller discrepancy between self-rated and government-rated performance,<sup>20</sup> lower rates of pressure ulcers and urinary tract infections,<sup>35</sup> and adequate daily care.<sup>36</sup> However, one study indicated that staffing rating could not predict rates of readmission or mortality.<sup>37</sup>

High occupancy rates indicate that nursing homes are in good financial standing, which in turn may present opportunities to improve their resources and advance their quality

of care.<sup>16,38</sup> Hospital-based nursing homes can obtain resources and support from hospitals, with which they have direct ties. Thus, compared with freestanding nursing homes, hospital-based nursing homes provide more diversified healthcare services, better quality equipment, and care from staff with greater expertise.

### **Internal Factors**

Accreditation enables nursing homes to provide better care; accredited nursing homes have been demonstrated to perform better than their non-accredited counterparts.<sup>39</sup> Among the numerous factors associated with accreditation, quality, defined as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes,<sup>40</sup> is the most essential to nursing homes. Quality of care is a complex construct that cannot be fully represented by any single indicator. Most studies generally adopt indicators proposed by Donabedian<sup>41</sup> regarding the perspectives of structure, process, and outcomes that denote aspects of quality of care. As mentioned, adequate staffing is a critical structure indicator; however, it does not necessarily correspond to satisfactory care; nursing skills constitutes a more accurate indicator. Nursing home residents often have multiple complicated and chronic conditions requiring both medical and psychological attention, meaning that the maintenance of a sufficient number of highly qualified staff members is vital to quality of care.<sup>42</sup>

Integrated care and person-centered care are particularly integral for nursing home residents. Often used with coordinated care and seamless care, integrated care refers to the provision of joined health services by teams from multiple disciplines (eg, medical, nursing, social work, pharmacy, and nutrition). Managed effectively, with appropriate use of resources based on the best available evidence, integrated care can lead to excellent outcomes for residents.<sup>43</sup> However, the literature on outcomes in integrated care is inconclusive. For example, integrated care enhances patient satisfaction, increases perceived quality of care, and enables greater access to services.<sup>44</sup> However, the evidence on better cost effectiveness, use of health services, quality of care, and quality of life remains conflicting.<sup>45</sup>

Person-centered care creates an environment that allows residents of nursing homes to engage in meaningful life activities that can potentially help improve their physical, psychological, and social well-being.<sup>46</sup> Facilities providing person-centered care are regarded as providing efficient and effective services.<sup>47,48</sup> Person-centered care alleviates residents' depressive symptoms,<sup>49</sup> improves their functional status, lowers infection rates,<sup>50</sup> and boosts both resident and employee satisfaction.<sup>49</sup> However, whether it directly improves other quality of care indicators, such as fall rate<sup>51</sup> and quality of life,<sup>50</sup> remains unclear.

Quality is a building block in gaining competitive advantage, though this environment of constantly evolving

regulations and a consistently growing number of rival facilities presents as a major challenge to nursing homes. Williams et al.<sup>26</sup> noted that accredited nursing homes have been documented as having less “deficiencies” (as defined by lower amounts of fines and rates of payment denials) which may be inferred as demonstrating higher quality. However, accredited nursing homes did not necessarily reflect high quality of care as quality measures were self-reported and were incomparable to that of other nursing homes nationwide.<sup>25</sup> Moreover, the nursing home rating system in the United States offers financial incentives and purposefully reports inflated data, which may corroborate why ratings on *Nursing Home Compare* were higher than those rated by the average consumer.<sup>52</sup>

To become accredited, facilities adopt guideline approaches to improve quality so as to meet the minimum standards set by the government. Yet, evidence indicates that such strategies have mixed results on professional practice and resident outcomes. For instance, strategies may be associated with lower rates of physical restraint,<sup>53</sup> have no effect on the prevalence of atypical antipsychotic use,<sup>54</sup> or may not significantly affect the quality of adequate preventive care for residents at risk of pressure ulcers, urinary tract infections, or falls.<sup>55</sup> Previous studies have demonstrated that numerous factors take part in determining organizational success in achieving accreditation, yet few comprehensive models exist to delineate which factors contribute more to successful accreditation. The current study investigated external environmental, organizational, and internal determinants associated with accreditation scores. In particular, we examined which of these dimensions account for the greatest variations in accreditation scores. We aim to make a substantial contribution to the literature on the designing of long-term care systems and the scientific basis for long-term care regulatory policy.

## Data and Methods

### Data and Sample

All 538 skilled nursing facilities in Taiwan that applied for accreditation from 2017 through 2019 were included. Data were collected from several sources. The main data was from the Accreditation for General Nursing Homes from the MOHW, Taiwan. Interrater reliability was obtained by training committee members (in general 3 members in total for each nursing home) to follow common guidelines and practice accreditation before evaluating nursing homes. After evaluation, a meeting was held to obtain consensus. If the discrepancy was larger than normal distribution, then the MOHW would ask another third party to re-evaluate the nursing homes. The accreditation data were not public files and had to be applied for research purposes. Additionally, data from the Department of Statistics of the Ministry of the Interior, the National Development Council, the Department

of Health, district city governments, and the Office of Registration for Practice of the MOHW were public files.

### Measures

**Dependent variable: total accreditation score.** The accreditation score was given by the average of the 3 reviewers based on the criteria or standards established by the MOHW. The maximum score is 100, with a higher score indicating better performance.

## Independent Variables

### External Factors

**Average household income by county.** Average household income at the county level was calculated as the total household income in a county divided by the total number of households in that county. The data were sourced from the Department of Statistics of the Ministry of the Interior.<sup>56</sup>

**Herfindahl–Hirschman Index.** We calculated the HHI to measure the competitiveness of each nursing home’s market. The steps by which the HHI was determined are as follows. First, the market share of each nursing home was calculated as the number of staffed beds divided by the total number of staffed beds in a market (defined in this study as a county). Second, the squares of the market shares were summed and then multiplied by 10,000. The HHI can range from close to zero to 10,000. A poorly, moderately, and highly concentrated market typically has an HHI of less than 1500, between 1500 and 2500, and 2500 or over, respectively.

**Old-age dependency ratio, population density, and number of older adult households.** The data on the old-age dependency ratio, population density, and number of older adult households were sourced from the National Development Council.<sup>57</sup> Old-age dependency ratio was calculated as the population of those aged 65 years or over divided by the population of those aged between 15 and 64 years, multiplied by 100. Population density refers to the number of people per square kilometer. The number of older adult households denotes the number of households with at least one person over the age of 65 years in a given county.

### Organizational Factors

Variables related to organizational factors included whether a facility was hospital-based (coded as 1 = yes, 0 = no) or chain-affiliated (coded as 1 = yes, 0 = no). For data verification, we checked each facility’s website to determine its status. If this information was unavailable on the website, then the facilities were contacted by telephone. For each nursing home, the number of registered nurses or nurse aides per bed was calculated as the number of nurses or nurse aides,

respectively, divided by the number of staffed beds. Occupancy rate was calculated as inpatient days of care divided by bed days available and then multiplied by 100. Data on registered nurses and nurse aides were sourced from the Office of Registration for Practice of the MOHW. Bed size was classified as small, medium, and large (1-49, 50-99, and  $\geq 100$  beds, respectively). These variables were evaluated at the organizational level.

### *Internal Factors*

**Accountability.** The responsible party of a nursing home should provide direct care. This means that this person should be a full-time staff member receiving at least 4 hours per year of on-the-job training in administration and quality control. Nursing homes that did and did not fulfill this criterion were coded as 1 and 0, respectively. The data were sourced from the Accreditation for General Nursing Homes from the MOHW, Taiwan.

**Deficiencies.** If a facility had hired unlicensed or part-time care professionals, including registered nurses, nurse aides, and social workers, within the past year, or all payroll employees did not have a valid emergency medical technician certificate, it was marked as having deficiencies (coded as 1). If a facility committed no such violations, it was coded as 0. Data originated from the Department of Health from district city government.

**Person-centered care.** Facilities were required to have assessed each resident's needs for physical, psychological, and social care within the past 72 hours and provided care accordingly. Such an assessment was required to be performed every 3 months for each resident, with appropriate revisions made to their care plans. This variable was evaluated on a 5-point Likert scale, with 1 and 5 indicating no and complete fulfillment of the criteria, respectively. The data were sourced from the Accreditation for General Nursing Homes from the MOHW, Taiwan.

**Nursing skills.** Nursing skills referred to standard care skills such as sputum suction, dressing change, nasogastric tube replacement, urinary catheter replacement, and nasogastric tube feeding, as well as regular monitoring of residents' health status. This variable was evaluated on a 5-point Likert scale, with 1 and 5 indicating no and complete fulfillment of the criteria, respectively. The data were sourced from the Accreditation for General Nursing Homes from the MOHW, Taiwan.

**Integrated care.** A nursing home was considered to provide integrated care if it coordinated with healthcare professionals from relevant specialties (including nursing, medicine, nutrition, physical therapy, occupational therapy, and social work). This variable was evaluated on a 5-point Likert scale, with 1 and 5 indicating no and complete fulfillment of the criteria,

respectively. The data were sourced from the Accreditation for General Nursing Homes from the MOHW, Taiwan.

**Quality control.** A nursing home should provide satisfactory care to its residents and develop quality control indicators, such as number of falls, pressure sore, need for physical restraints, infection, unplanned hospitalization, and unplanned weight changes. These indicators should be monitored and reviewed regularly. This variable was evaluated on a 5-point Likert scale, with 1 and 5 indicating no and complete fulfillment of the criteria, respectively. The data were sourced from the Accreditation for General Nursing Homes from the MOHW, Taiwan.

**Data analysis.** All analyses were performed using IBM SPSS Statistics for Windows, version 24 (IBM Corp, Armonk, NY, USA).<sup>58</sup> Descriptive analysis was used to analyze the demographic characteristics of the sample. Hierarchical regression was used to examine factors associated with accreditation score. The regression equations were formulated as follows: in a first model, we regressed the accreditation scores on variables associated with external factors. In model 2, we entered the variables associated with organizational factors into the model. Finally, in the third model, variables associated with internal factors were included. The indices of model fit were based on the adjusted  $R^2$ ,  $\Delta R^2$ , and  $\Delta F$ . A  $P$  value of  $<0.05$  was considered to be significant.

## **Results**

### *Sample Characteristics*

The average household income at the county level was approximately US\$27,830, with a mean HHI of 3407.46. The means of the old-age dependency ratio, population density, and number of older adult households were 21.06%, 12,300/km<sup>2</sup>, and 346.27, respectively. The mean occupancy rate was 84.98%. Facilities with small, medium, and large bed size accounted for 25.3%, 56.9%, and 17.8% of the total, respectively. Approximately 32.5% and 4.1% of facilities were hospital-based and chain-affiliated, respectively. The average total accreditation score was 81.67, with a range between 47 and 99.15. [Table 1](#) summarizes the descriptive statistics.

### *Correlations and Hierarchical Regression*

[Table 2](#) presents a summary of the correlations between the continuous variables. Total accreditation score was significantly positively correlated with average household income at the county level ( $r = .104$ ,  $P < .05$ ), number of registered nurses per bed ( $r = .100$ ,  $P < .05$ ), number of nurse aides per bed ( $r = .099$ ,  $P < .05$ ), provision of person-centered care ( $r = .501$ ,  $P < .01$ ), nursing skills ( $r = .416$ ,  $P < .01$ ), quality control ( $r = .467$ ,  $P < .01$ ), and integrated care status ( $r = .354$ ,  $P < .01$ ).

**Table 1.** Descriptive Statistics.

Variables	Frequency (%)	Mean	SD	Min	Max
Average total income in a county	—	27.83	5.10	20.14	56.82
Herfindahl–Hirschman Index	—	3407.46	2757.94	700.00	10,000.00
Old-age dependency ratio	—	21.06	5.01	12.29	40.29
Population density	—	12,306.83	11,892.93	161.79	46,200.95
Number of elderly households	—	346.27	111.15	57.22	804.45
Occupancy rate	—	84.98	13.57	3.25	100.00
Bed size					
Small	136 (25.3)	—	—	—	—
Medium	306 (56.9)	—	—	—	—
Large	96 (17.8)	—	—	—	—
Registered nurse per bed	—	0.12	0.07	0.01	1.04
Nurse aides per bed	—	0.29	0.08	0.09	0.64
Hospital-based					
Yes	175 (32.5)	—	—	—	—
No	363 (67.5)	—	—	—	—
Chain					
Yes	22 (4.1)	—	—	—	—
No	516 (95.9)	—	—	—	—
Accountability					
Yes	441 (82.0)	—	—	—	—
No	97 (18.0)	—	—	—	—
Deficiencies					
Yes	102 (19.0)	—	—	—	—
No	436 (81.0)	—	—	—	—
Person-centered care	—	3.94	0.86	1.00	5.00
Nursing skills	—	4.11	1.14	1.00	5.00
Quality control	—	3.79	0.85	1.00	5.00
Integrated care	—	4.52	0.93	1.00	5.00
Accreditation score	—	81.67	7.96	47.00	99.15

Note. N = 538. Min, minimum; Max, maximum; SD, standard deviation. Monetary unit of average total income in a county: 1000 USD.

To examine whether the clustering of nursing homes nested in the same county, we performed a robust check and found ICC (1) to be 0.08, suggesting that the information was coming from independent counties. Thus, a hierarchical regression analysis was conducted (Table 3). In model 1, the average household income at the county level was significantly positively correlated with total accreditation score ( $\beta = .124, P < .05$ ). In model 2, occupancy rate ( $\beta = .099, P < .05$ ), bed size—medium vs small ( $\beta = .251, P < .001$ ), bed size—large vs small ( $\beta = .344, P < .001$ ), number of registered nurses per bed ( $\beta = .088, P < .05$ ), number of nurse aides per bed ( $\beta = .105, P < .05$ ), and hospital-based status ( $\beta = .268, P < .001$ ) were significantly positively correlated with total accreditation score. Regarding model fit, the adjusted  $R^2$  was 17.3% ( $\Delta R^2 = 0.173, \Delta F = 15.896, P < .001$ ). In model 3, bed size—medium vs small ( $\beta = .200, P < .001$ ), bed size—large vs small ( $\beta = .226, P < .001$ ), hospital-based status ( $\beta = .148, P < .001$ ), accountability ( $\beta = .149, P < .001$ ), deficiencies ( $\beta = .175, P < .001$ ), provision of person-centered

care ( $\beta = .260, P < .001$ ), nursing skills ( $\beta = .268, P < .001$ ), quality control ( $\beta = .201, P < .001$ ), and integrated care ( $\beta = .139, P < .001$ ) were significantly positively correlated with total accreditation score. The adjusted  $R^2$  was 56.9% ( $\Delta R^2 = 0.392, \Delta F = 80.649, P < .001$ ).

## Discussion

The results demonstrate that when only the external environment is considered, average household income by county is a significant predictor of accreditation. Organizational factors, such as bed size and hospital-based status, as well as the number of nursing staff members per bed, were critical. When all factors were considered, bed size, hospital-based status, accountability, deficiencies, person-centered care, nursing skills, quality control, and integrated care were significantly positively correlated with total accreditation score.

Consistent with the extant literature, quality of care was the pivotal concern for prospective residents. Moreover, our

**Table 2.** Correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12..
1. Average total income in a county												
2. Herfindahl–Hirschman Index	-0.174**											
3. Old-age dependency ratio	-0.100*	0.293**										
4. Population density	0.492**	-0.350**	-0.240**									
5. Number of elderly households	0.651**	-0.307**	-0.332**	0.563**								
6. Occupancy rate	0.116**	-0.027	0.016	0.159**	0.105*							
7. Registered nurse per bed	0.197**	0.039	0.007	0.094*	0.162**	0.020						
8. Nurse aides per bed	0.208**	0.004	-0.069	0.258**	0.227**	0.234**	0.271**					
9. Person-centered care	0.067	0.041	-0.003	0.019	0.100*	0.025	0.087*	0.136**				
10. Nursing skills	0.029	0.009	-0.016	-0.023	-0.051	-0.001	0.000	-0.098*	0.136**			
11. Quality control	0.080	0.014	0.032	0.030	0.107*	0.052	0.101*	0.151**	0.469**	0.149**		
12. Integrated care	0.028	0.024	0.062	0.045	0.000	0.062	0.053	0.065	0.337**	0.112**	0.290**	
13. Accreditation score	0.104*	0.034	0.035	-0.005	0.081	0.076	0.100*	0.099*	0.501**	0.416**	0.467**	0.354**

Note. \*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.05.

**Table 3.** Hierarchical regression.

Variables	Accreditation Scores								
	Model 1			Model 2			Model 3		
	$\beta$	<i>T</i>	<i>p</i>	$\beta$	<i>t</i>	<i>p</i>	$\beta$	<i>t</i>	<i>p</i>
<b>External factors</b>									
Average household income by county	0.124*	2.374	0.018	0.047	0.963	0.336	0.037	1.059	0.290
Herfindahl–Hirschman Index	0.029	0.617	0.537	−0.002	−0.042	0.966	−0.032	−1.000	0.318
Old-age dependency ratio	0.105	1.051	0.294	0.017	0.186	0.852	−0.007	−0.099	0.921
Population density	−0.054	−1.026	0.305	−0.026	−0.514	0.608	−0.043	−1.185	0.237
Number of older adult households	−0.088	−0.881	0.379	−0.033	−0.354	0.724	0.002	0.026	0.979
<b>Organizational factors</b>									
Bed size									
Medium vs small				0.251***	5.021	<0.001	0.200***	5.500	<0.001
Large vs small				0.344***	6.877	<0.001	0.226***	6.174	<0.001
Chain				0.019	0.485	0.628	0.054	1.827	0.068
Staffing									
Registered nurse per bed				0.088*	2.009	0.045	0.058	1.811	0.071
Nurse aides per bed				0.105*	2.408	0.016	0.052	1.628	0.104
Occupancy rate				0.099*	2.387	0.017	0.048	1.575	0.116
Hospital based				0.268***	6.407	<0.001	0.148***	4.828	<0.001
<b>Internal factors</b>									
Accountability							0.149***	4.953	<0.001
Deficiencies							0.175***	5.915	<0.001
Person-centered care							0.260***	7.766	<0.001
Nursing skills							0.268***	8.897	<0.001
Quality control							0.201***	6.066	<0.001
Integrated care							0.139***	4.490	<0.001
$R^2$	0.018			0.191			0.584		
Adjusted $R^2$	0.009			0.173			0.569		
$\Delta R^2$	0.018			0.173			0.392		
$\Delta F$ value	1.934			15.896***			80.649***		

Note. N = 538.

\* $P < 0.05$ .

\*\* $P < 0.01$ .

\*\*\* $P < 0.001$ .

results indicate that nursing homes providing person-centered care and integrated care were correlated with better total accreditation score. Quality indicators, which are designed primarily for the assessment of daily operations, help providers establish action plans for continuous improvement. In sum, quality indicators are powerful determinants of accreditation score. The results also demonstrate that the less deficient a nursing home is, the more likely it is to receive a higher accreditation score, similar to the findings of a relevant study.<sup>26</sup> The employment of licensed, full-time staff is usually the cornerstone of quality assurance.

Larger size and hospital-based status were organizational factors correlated with higher total accreditation score, most likely because such institutions enjoy relatively easy access to resources. The most important resources for nursing homes are the capacity to transfer residents to the hospital whenever they require medical attention (including hospitalization). Larger facilities are more likely to distribute resources evenly

and attain economies of scale, thereby achieving higher efficiency.<sup>59,60</sup>

Our results demonstrate that when internal factors such as process and outcome quality indicators are not considered, higher numbers of registered nurses and nurse aides per bed are positively associated with successful accreditation. Once those quality indicators were included, the result became nonsignificant. This indicates that process or outcome quality indicators are more important than structure indicators with regard to accreditation success.

Notably, the location of a nursing home in a county with higher average household income was the only external environmental factor associated with better accreditation score. Our findings are consistent with those of Konetzka et al.<sup>61</sup> that high-quality care providers tend to be located in relatively affluent areas. However, once organizational and internal factors were considered, this association was no longer significant.



## Implications

This study has several implications. We found that internal factors are key determinants to success in accreditations. Results suggested that process- or outcome-related indicators are better predictors than structure-related ones. In particular, person-centered care and integrated care processes both enhanced technical and patient-experienced quality of care.<sup>62,63</sup> Thus, nursing homes providing person-centered care and integrated care will improve quality of care and benefit residents, families, and organization itself.

This study also found that larger and hospital-based nursing homes were more likely to have higher accreditation scores. This suggests that nursing homes could engage in strategic alliance with larger facilities or hospitals to assure necessary resources when transferring residents to hospitals or negotiating purchasing prices of medical devices, dressings or drugs. The current study was conducted in Taiwan; hence, in this study context, no incentives to improve better rating or accreditation were provided. We support the possibility that it may be helpful to provide incentives to improve outcome-quality and accreditation.

## Limitations

Our study has several limitations. First, as we evaluated a particular subset of long-term care facilities involved in accreditation activities, caution should be warranted when generalizing these findings to facilities beyond nursing homes. Future research on determinants of accreditation should consider various types of long-term care facilities. Second, the inclusion of several county-level variables may have masked the inherent heterogeneity within a county. For example, a nursing home facing competition with a neighboring facility located in a different county would not be included in the same competition index. Third, differences in the timing of data collection and composition of accreditation committee evaluating the nursing homes could have affected the accreditation results, as interrater reliability issues may exist. Finally, due to the use of secondary data, several factors were not included in this study. Organizational culture, leadership, turnover rate of nursing staff could also potentially influence accreditation results.<sup>64,65</sup> Future studies may consider collecting these variables as well.

## Conclusion

The results present a complex array of combinations of accreditation dimensions. Internal factors, such as nursing skills and quality-related indicators, are the most critical contributors to successful accreditation, followed by organizational and external factors. As mentioned, the current accreditation system is centered on structure- and process-related quality indicators. Although some researchers argue that indicators of structure

and process quality are precursors of outcome quality,<sup>66</sup> direct quality indicators are most decisive for accreditation.

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I certify that the manuscript is our own work and that all sources of information used in this study have been fully acknowledged.

## Author Contributions

Theoretical and conceptual framework: Yeh, Tsay; methodology: Yeh & Wang; data collection: Tsay and Wang; analyses: Wang; original draft preparation: Yeh and Lo; review and editing: Shi

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The authors declare no conflict of interest.

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Ethical review and approval were waived for this study, due to the study not involving humans or animals.

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