

Evaluation of Nursing Manpower Allocation in a Nursing Home

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ABSTRACT: The subjects of this study encompassed the nursing staffs (nurses and nursing aids) and residents of a public hospital-based nursing home. By intensive sampling, this study explored the differences in actual times that nurses spent caring for residents. We assessed the functional status of nursing home residents of various illness severities as well as measured the actual nursing manpower needed to meet the residents' care needs using Typology of the Aged with Illustration (TAI). Results showed that current nursing manpower levels in nursing homes was adequate, although some units had excessive manpower allocation. As a result, this study suggests the establishment of a resident classification system for use in long-term care (LTC) facilities to assist with manpower allocation and reasonable utilization of resources within the facility. Adequate nurse staffing will enhance the quality and accessibility of care for the residents with severe illnesses in LTC facilities.

Key Words: nursing home, manpower allocation, nursing time, Typology of the Aged with Illustration (TAI).

Introduction

Domestic health organizations at all levels focus on the medical treatment of acute illnesses, and, therefore, are able to provide limited nursing experience for long-term care (LTC). According to the Department of Health (DOH), Executive Yuan, the total number of senior citizens requiring LTC in Taiwan amounted to 174,473 in 2003, of which 34% or approximately fifty thousand elderly people require institutional care (DOH, Executive Yuan, 2003). Nursing homes have been the most common setting chosen by dysfunctional frail elderly individuals in the United States. According to Cohen, Tell and Wallack (1986), the elderly population (> 65 years) has a 40% chance of staying in a nursing home before they die (Lai, 1994). Hence, in order to shed light on future need for institutions providing LTC, this study chose nursing homes as the object of this study.

Institutional care requires high levels of manpower input and demands a substantial proportion of available trained nurses. There are significant variations in practice

patterns found between nurse practitioners employed within a particular LTC facility as compared with those employed in other arrangements (Rosenfeld, Kobayashi, Barber, & Mezey, 2004). Increase in demand for LTC drives healthcare worker shortages (Hussein & Manthorpe, 2005). It was found that work stressors are significantly related to the total number of residents taken care of by nursing staffs and the number of nursing hours spent (Lin, Yin, & Li, 2002). As nursing manpower can be more efficiently allocated and utilized, waste of human resources might be effectively minimized and work-related stress relieved. In fact, minimum manpower ratios are regulated by governments around the world for providing care in institutional care settings. For instance, the ratio of beds to nurses in nursing homes in Taiwan is 15:1, while that for beds to nursing aids is 5:1 (DOH, Executive Yuan, 2000). The allocation of nursing manpower in Taiwan, however, has long been viewed to be inadequate (Su, 1988). Therefore, nursing manpower needs to be reviewed and re-evaluated in order to meet the needs of nursing home residents. Since 1987, most health institutions in the United

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States have used the patient-related classification system to measure nursing manpower. This system stipulates that all qualified nursing homes categorized in Medicare or Medicaid in every state must apply a standardized comprehensive assessment instrument, the Minimum Data Set (MDS) for nursing home resident assessment and care screening, for detailed assessment and collection of resident nursing data. They also state that nursing quality must be improved based on drafted nursing plans (Rantz et al., 2000). In spite of its numerous advantages, the application of MDS is time-consuming and cannot fully capture the full spectrum of all details (Spector & Mukamel, 1998). It is therefore not a particularly appropriate assessment tool for nursing homes in Taiwan or many other countries. In addition, George (1994) maintained that other assessment features of MDS should be reinforced and used with due discretion. For instance, great emphasis was placed on the issue of reliability in the development of MDS without considering validity (Hsu, 1999). Kane (1995) indicated some relevant problems with the application of MDS, e.g., unverified results of the measurement over a substantial period of time and nursing staff's capability in conducting the assessment. Therefore, a key point of the training guidelines proposed by the Taiwan Long-Term Care Professionals Association is to set up localized quality indicators for long-term nursing. However, as long-term nursing practice in Taiwan continues to develop and change, it lacks standardized measuring indicators. In spite of the fact that MDS is well established in the United States and some Organization for Economic Cooperation and Development (OECD) member countries, it is very comprehensive as well as time-consuming and, therefore, not suitable for evaluating nursing homes in Taiwan.

Evaluating content by Typology of the Aged with Illustration (TAI), simpler and more convenient than MDS, can be used to evaluate illness severity in residents quickly. It also has the advantage of being less expensive to administer. Liu (2001) adopted the TAI to evaluate illness severity in residents and established a cost accounting system for a nursing home based on the results. In order to conform to the customs and nursing practices in Taiwan, this study chose to use an instrumental system from Japan as a reference with which to evaluate the characteristics and organizational behavior of residents in LTC facilities. A public hospital nursing home was selected as the research sample to investigate differences in the actual nursing hours spent to care for residents by intensive sampling, to measure the

actual nursing manpower that would meet the nursing needs of residents, and then to provide reasonably sufficient manpower allocation.

Methods

Instrument

TAI was developed to predict the extent of nursing service required by the elderly. Five dimensions, i.e., mentality, activity, diet intake, excretion, and medical intervention, were used to evaluate the severity of illness and progression of aging in the elderly. The above-mentioned scopes categorized elderly people into four groups, namely Border, Confused, Immobile, and Medical. According to the extent of nursing required by the elderly, the four groups were then broken down into three TAI rankings, which comprise a total of twelve TAI rankings (Takahashi, 2001). However, as this nursing home study did not include the two TAI resident rankings B3 and I1, the total number of TAI rankings was reduced to ten. The definition of each TAI ranking is shown in Table 1 (Takahashi, 2001).

Reliability

Because the TAI requires that professionals perform the assessment, a senior nursing staff member from the individual hospital-based nursing home assessed hospitalized residents for this study. In order to improve finding consistency, we applied a test-retest reliability procedure, with the assessment being conducted one time each on the first and second day of observation. Compared to the test-retest reliability of 90% in Liu's research (2001), this study showed that among the 102 residents, 97 answered consistently, making test-retest reliability as high as 95%.

Sample

The study selected a public hospital nursing home that had already conducted the TAI, and the participants were categorized into two groups: nursing staff, including 15 nurses and 36 nursing aids, and 106 nursing care residents. Samples for both groups were drawn from three different nursing care units, which included the dementia center, nursing care unit, and regular nursing care unit, in a hospital-based nursing home. However, four nursing home residents were discharged during the data collection period and their data were subsequently excluded from further analysis, which reduced the total number of valid samples to 102.

Table 1.
TAI Ranking Definitions

TAI ranking	Illustration
B5	Not in need of care
B4	Not in need of care on diet intake and excretion, but unable to move independently
B3	In need of care on either diet intake or excretion
C4	Group of Confused, not in need of care on diet and excretion
C3	Group of Confused, in need of care on either diet or excretion
C2	Group of Confused, in need of care on both diet and excretion
I3	Not in need of care on diet, but in need of help in moving
I2	In need of care on diet and attention to moving
I1	In need of care on diet and help in moving
M0	In need of special medical care, with tracheotomy, nasogastric tube, catheter, or one kind of wound
MA	In need of special medical care, with tracheotomy, nasogastric tube, catheter, or two kinds of wound
MI	In need of special medical care, with tracheotomy, nasogastric tube, catheter, or three kinds of wound

Note. B = border; C = confused; I = immobile; M = medical; M0 = medical 0 rank; MA = medical acute; MI = medical intensive.

Data and Procedure

Data were derived from two different sources: (1) a senior nursing staff member from a hospital-based nursing home assessed the TAI rankings of hospitalized residents and assessed each resident's care need based on such and (2) observers employed for this study completed nursing activities records. In order to improve the data accuracy and avoid the interference of the Hawthorne effect, nursing staff were required to perform nursing activities in accordance with standard operating procedures. Nursing time for standard operating procedures was confirmed by the supervisor before data were officially compiled. Besides, in order to precisely distinguish between nursing activities performed by nurses from those performed by nursing aids, this study limited valid nursing care to those activities associated with direct medical nursing care to be performed by nurses. To prepare themselves, observers took training courses to learn nursing activity standard operating procedures. Furthermore, one-on-one observation was adopted for this study to enhance the consistency and accuracy of the "nursing hour" recorded by each observer. Nursing activities were observed and recorded for two consecutive weeks.

Analysis

Nursing hour analysis

The Kruskal-Wallis (K-W) Test of nonparametric statistics was used to examine whether TAI rankings made differences in average nursing hours for each group of residents (rank average). In addition, researchers applied the

Mann-Whitney (M-W) U Test to determine differences among TAI ranking pairs in terms of nursing hours.

Nursing manpower analysis

First, the average number of nursing activities (n_i) that nurses and nursing aids were required to perform for residents each day was calculated for each category. Second, this outcome was multiplied by the average number of nursing hours required to perform each nursing activity (x_i). The average number of nursing hours required per day for a resident in each category was calculated after adding fatigue allowance of 10% (Liu, 1999). Third, the number of residents in each category (n_j) was multiplied by the actual number of nurses and nursing aids required to perform three shifts per day. The result was then divided by each working shift (8 hours) to determine actual nursing manpower needed. In summary, nursing manpower was calculated according to the following formula:

$$\text{Nursing manpower} = \frac{\left(\sum n_i (x_i + 10\%) \right) \times n_j}{8 \text{ hours}}$$

Results

Description of Time Distribution for Various Nursing Activities

The time distribution of various nursing activities for major nursing staff

As shown in Table 2, direct nursing activities consumed the greatest amount of time in the nursing care unit.

Table 2.
Time Consumption Distribution of Various Nursing Activities for Key Nursing Staff

Item	Hour (%)				Total
	Direct nursing care	Indirect nursing care	Related nursing care	Private time	
Nurse					
Dementia center	7.93 (33.04)	5.49 (22.88)	3.66 (15.25)	6.92 (28.83)	24.00
Nursing care	8.66 (36.08)	5.86 (24.42)	4.05 (16.88)	5.43 (22.63)	24.00
Regular nursing care	8.03 (33.46)	8.14 (33.92)	3.20 (13.33)	4.63 (19.29)	24.00
Nursing Aid					
Dementia center	9.71 (40.46)	2.78 (11.58)	4.49 (18.71)	7.02 (29.25)	24.00
Nursing care	15.66 (65.25)	2.51 (10.46)	1.86 (7.75)	3.97 (16.54)	24.00
Regular nursing care	11.44 (47.67)	3.83 (15.96)	2.39 (9.96)	6.34 (26.42)	24.00

Note. Direct nursing care: activities involving direct interaction with residents (e.g., endotracheal suctioning). Indirect nursing care: activities indirectly connected with residents (e.g., preparing nursing records). Related nursing care: e.g., attending administrative conventions. Private time: e.g., eating.

Table 3.
Average Time Spent on Various Nursing Activities by Nurses Caring for Mobile Group Patients (Unit: Hour)

Official rank	TAI ranking	Direct nursing care	Indirect nursing care	Related nursing care
Nurse	B4	0.18	0.42	0.25
	B5	0.19	0.44	0.24
	C2	0.32	0.37	0.21
	C3	0.41	0.33	0.19
	C4	0.32	0.33	0.19
	subtotal		1.42	1.89
Nursing aid	B4	0.83	0.35	0.12
	B5	0.92	0.48	0.10
	C2	1.54	0.38	0.18
	C3	1.65	0.37	0.21
	C4	0.93	0.30	0.19
	subtotal		5.87	1.88

Note. See Table 1 for TAI rankings.

However, private time spent by nurses and nursing aids accounted for a greater share of total time than either indirect nursing or related nursing activities.

Overview of the distribution of time spent on TAI rankings

The Mobile group rated by TAI was categorized into the five subgroups of B4, B5, C2, C3, and C4 (Table 3). Nursing aids spent the greatest amount of time on direct nursing; while nurses spent most of their time on indirect nursing activities for the Mobile group.

The Immobile group rated by TAI was also categorized into five subgroups, namely I2, I3, M0, MA and MI (Table 4). While nursing aids invested their greatest amount

of time in direct nursing, nurses spent most of their time on indirect nursing activities for this group.

Analysis of Nursing Hours Spent Caring for Residents on All TAI Rankings

The number of residents was inadequate to evaluate the respective severity of illness scope. Therefore, a K-W Test of nonparametric statistics was performed to examine whether the TAI ranking made differences in nursing hours among residents. An M-W U Test was then conducted as a pair-wise comparison to find out which pair of TAI rankings had caused statistically significant differences. It was found that the average number of nursing hours spent on caring for each group of residents

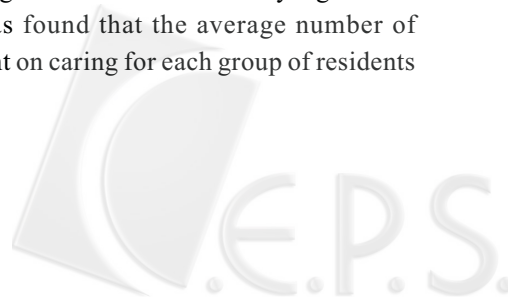


Table 4.
Average Time Spent on Various Nursing Activities by Nurses Caring for Immobile Group Patients (Unit: Hour)

Official rank	TAI ranking	Direct nursing care	Indirect nursing care	Related nursing care
Nurse	I2	0.17	0.39	0.16
	I3	0.15	0.38	0.18
	M0	0.23	0.41	0.22
	MA	0.49	0.40	0.15
	MI	0.54	0.40	0.15
	subtotal	1.58	1.98	0.86
Nursing aid	I2	1.24	0.32	0.08
	I3	0.79	0.32	0.08
	M0	1.49	0.38	0.11
	MA	1.63	0.32	0.10
	MI	1.52	0.33	0.10
	subtotal	6.67	1.67	0.47

Note. See Table 1 for TAI rankings.

Table 5.
K-W Test of Nursing Hours Among All TAI Rankings (N = 102)

TAI ranking	n	Mean Rank for nurses	Mean Rank for nursing aids	χ^2	p
B5	2	42.50	24.00	18.29 ^a (20.27 ^b)	.032 ^{a*} (.016 ^{b*})
B4	3	37.25	13.63		
C2	9	50.78	56.72		
C3	13	41.46	60.42		
C4	6	44.10	26.70		
I2	3	16.83	29.83		
I3	2	18.75	10.00		
M0	23	42.86	53.71		
MA	20	61.03	54.84		
MI	11	67.41	53.64		

Note. K-W Test = Kruskal-Wallis Test. ^anurse; ^bnursing aid.
* $p < .05$.

in TAI rankings was significant ($p < .05$), as presented in Table 5.

Pair-wise comparisons among all TAI rankings revealed that two pairs of TAI rankings on the part of nurses were significant ($p < .05$) for total nursing hours and six pairs of TAI rankings on the part of nursing aids differed in the total spent nursing hours. Research also found that nursing aids spent less total nursing hours on the residents in Border (B4) and Mobile (I3) groups than with those in Confused (C3, C2) and Medical nursing requirement (MA) groups (see Table 6).

Nursing Manpower Analysis

The amount of nursing manpower dedicated to three shifts in the dementia center was excessive. Hence, the

Table 6.
M-W U Test of Nursing Hours Among all TAI rankings (N = 102)

Official rank/TAI ranking	M-W U	p
Nurse		
I2 < MI	2.00	.024*
I2 < MA	5.00	.013*
Nursing Aid		
I3 < C3	0.00	.027*
I3 < C2	0.00	.034*
I3 < MA	2.50	.033*
B4 < C3	2.00	.007**
B4 < C2	2.00	.014*
B4 < MA	8.00	.006**

Note. M-W U Test = Mann-Whitney U Test.
* $p < .05$. ** $p < .01$.

Table 7.
Nursing Manpower Analysis

Item	Current Manpower		Adaptable Manpower	
	Nurse	Nursing aid	Nurse	Nursing aid
Dementia Center				
Day-shift	1	3	0.60	1.97
Evening-shift	1	1	0.32	0.51
Night-shift	1	1	0.41	0.53
Nursing Care				
Day-Shift	2	6	2.32	5.31
Evening-shift	2	3	1.99	2.72
Night-shift	1	3	1.08	2.64
Regular Nursing Care				
Day-shift	2	7	2.50	6.42
Evening-shift	1	3	1.36	2.45
Night-shift	1	3	1.35	2.33
Total	12	30	11.93 (≈ 12)	24.88 (≈ 25)

Note. The nursing manpower analysis is based on TAI rankings. ≈ refers to approximately.

number of residents under the care of these shifts could be increased based on approach methodology. Current and adaptable manpower were in close fit on the part of nurses even though the current number of nurses on day shifts and night shifts fell slightly short of the ideal. Also, although current nursing aid manpower exceeded that of adaptable manpower by around 5 units, current nursing aid manpower for three shifts was excessive, as presented in Table 7.

Discussion

Analysis of Nursing Hours for Nursing Staff

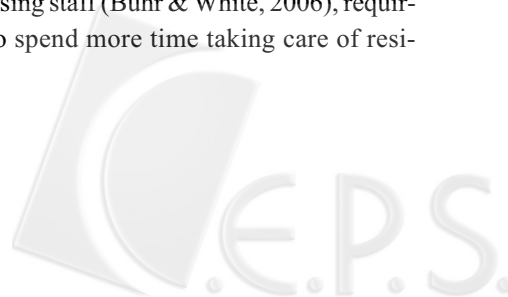
“Nursing hours” in this study refers to the time spent by nursing staff performing direct, indirect, and related nursing activities. These nursing activity categories accounted for all nursing activities performed in nursing homes. This study found that most nursing activities performed by the nursing staff to be “direct” nursing activities. Nurses and nursing aids spent 30%~40% and 40~70%, respectively, of their on-the-job time performing direct nursing activities in nursing homes. According to Lake’s work (1982), direct nursing time accounted for 28~35% of on-the-job time. Studies from Taiwan, such as that by Su (1988), have found direct nursing time to be 24.45%. Another study showed that direct nursing time was 34.5%, and suggested that the average direct nursing time provided

by nursing staff be considered sufficient only when this category accounted for at least 50% of nursing activities (Hsu, Feng, Lo, & Wang, 1996).

Differences in direct nursing time allocations are based on such factors as illness severity, nursing staff specialty and responsibilities, time of day of work shift, and hours spent at work. However, viewpoints on the definition and scope of “direct nursing activities” differ from one nursing home to another. The issue of how much direct nursing activity should be performed to meet the nursing quality expectation is something worthy of further discussion.

Nursing Hours Required for Residents Analyzed in Terms of Illness Severity

The study found that the nursing hours required to care for ill residents, as defined by their mobility, did not increase in line with illness severity. For example, Confused group residents remained in need of help with their lavatory needs in despite their better mobility compared to those in other groups. It was found that, all things being equal, incremental labor costs (per resident per shift) were USD 4.52 for residents with occasional urinary incontinence (Shih, Hartzema, & Tolleson-Rinehart, 2003). In addition, caring for residents with dementia can be a challenging task for nursing staff (Buhr & White, 2006), requiring nursing staff to spend more time taking care of resi-



dents' safety and monitoring and managing their conditions. However, residents in the Immobile group were subject to less variation in terms of nursing activities, as residents in this category are immobilized and chronically invalid. When compared to the group of Mobile residents, the Immobile group required fewer nursing hours per resident. The other reason why required nursing hours did not correspond directly to resident illness severity was the relatively small number of study participants. This limitation was particularly significant in subgroups B4 and B5. This might also contribute to the fact that residents in subgroups B4 and B5 received more nursing hours than those in other subgroups.

Comparison Between TAI and Minimum Data Set (MDS) for Nursing Home Resident Assessment and Care Screening

Kane (1995) pointed out that the strength of MDS was its prospective potential in outcome approach to provide important information. However, assessments of nursing homes have been insufficient. The advantages of MDS have been compromised by the fact that there are no data available with which to form a basis for comparison. Teresi and Holmes (1992) also argued that by using multiple data sources, such as interviews to assess the physical condition and medical records of residents, MDS provides for no standardized measurement; a fact that raises concerns of inconsistency in measurements. Although TAI was unable to assess clearly the physical condition of residents requiring nursing, it still covered residents who were in better physical condition in the individual nursing homes. Besides, one senior nursing staff conducted measurements for all residents in accordance with a single standard assessment form. Assessment form contents were simple and easy to follow. Furthermore, TAI could regularly monitor changes in illness severity to provide residents with the most appropriate nursing service.

Nursing Manpower Analysis

A review of study findings makes it clear that the nursing manpower of three shifts was excessive (Table 7) and that either manpower should be reduced or the number of residents increased. Resident participants in this study belonged to a nursing care unit that had insufficient nursing manpower assigned to both day and night shifts. Even with an excess of nursing aids, nursing manpower in the three

shifts in the regular nursing care units was tight. Maintaining adequate staffing is crucial to assuring the delivery of quality care (Mueller, 2002). Manpower could be more effectively allocated through improved nursing unit job functions and the content of nursing care. In addition, substitute nurse responsibilities may be assigned to nursing aids able to help out and perform specific tasks. In this way, the problem of excess manpower would be resolved and the allocation of nursing manpower would be made more efficient.

Furthermore, according to the Nursing Law (DOH, Executive Yuan, 2000), which regulates nursing manpower allocation, each nurse should be responsible for fifteen beds and each nursing aid should be responsible for five beds. Under these rules, the 106 residents in one individual nursing home included in this study should retain 7.07 (8) nurses and 21.20 (22) nursing aids for patient care. However, the analysis of nursing manpower done in this study found that the level of nursing manpower deemed most appropriate (regardless of the unit) by the example nursing home was 11.93 (12) nurses and 24.88 (25) nursing aids. Therefore, the ideal nurse-to-residents and nursing aid-to-residents ratio in the example nursing home was 11.93:106 (or 1:8.89 [1:9]) and 24.88:106 (or 1:4.26 [1:5]). Results show that DOH regulations governing nursing manpower allocation were neither endorsed nor practiced at the facility.

Conclusions

Several suggestions and recommendations are offered for future research. In order to enhance data accuracy, researchers should communicate with nurses and nursing aids regarding research purpose and procedures before collecting data. Study findings indicated that total nursing hour needs would vary among patients based on TAI rankings. Due to the lack of available references with which to evaluate TAI reliability and validity, future research may further explore the differences in nursing manpower utilization between different TAI categories. Still, future research might need to evaluate illness severity in residents before using the TAI, as TAI is applicable only to the evaluation of residents in better physical condition. Moreover, nursing manpower utilization is a dynamic process. The cross-sectional findings identified in this study are unlikely to take into account all organizational dynamics. A longitudinal research project in the future might better present the dynamics and realities affecting nursing manpower utiliza-

tion, and thus further enhance and enrich our understanding of this issue.

In general, allocating nursing manpower simply to comply with minimum nursing law requirements is not feasible. Nursing manpower allocated based on illness severity-based needs and resource utilization, however, can help effectively meet residents' actual needs, reduce manpower costs for the facility, and improve nursing quality.

Limitations

Experienced and qualified doctors and nursing staffs fluent in the Japanese language translated the TAI used in this study from Japanese into Chinese. TAI content was also edited and proofread several times. However, due to human resource and time constraints, a back-translation of the TAI was not conducted. There are not many references or studies readily available with which to validate TAI reliability and validity in Taiwan. In addition, due to differences in residents' illness severity distribution, the number of Taiwan nursing home residents with certain TAI rankings, such as B5 and B4, were unacceptably small. Finally, all of the original TAI rankings were not fully applied or analyzed in this study and, as a result, outcome generalization is limited.

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References

- Buhr, G. T., & White, H. K. (2006). Difficult behaviors in long-term care patients with dementia. *Journal of the American Medical Directors Association, 7*(3), 180–192.
- Cohen, M. A., Tell, E. J., & Wallack, S. S. (1986). The life-time risk and cost of nursing home use among the elderly. *Medical Care, 124*, 1161–1172.
- Department of Health, Executive Yuan. (2000). *Nursing law*. Taipei: Author.
- Department of Health, Executive Yuan. (2003). *Medical statistics*. Retrieved December 1, 2005, from http://www.doh.gov.tw/statistic/統計年報/st2_92_3.htm
- George, L. K. (1994). Multidimensional assessment instruments: Present status and future prospects. *Annual Review of Gerontology and Geriatrics, 14*, 353–375.
- Hsu, H. C. (1999). Quality evaluation of outcome assessment in LTC: In the case of the minimum data set for nursing home residents and care screening. *The Journal of Nursing, 46*(1), 57–64.
- Hsu, N., Feng, R. C., Lo, H. Y., & Wang, P. W. (1996). The application of factor type patient classification systems. *VGH Nursing, 13*(4), 446–455.
- Hussein, S., & Manthorpe, J. (2005). An international review of the long-term care workforce: Policies and shortages. *Journal of Aging & Social Policy, 17*(4), 75–94.
- Kane, R. L. (1995). Improving the quality of long term care. *Journal of the American Medical Association, 273*(17), 1376–1380.
- Lai, H. L. (1994). Nursing home in America and the related issues. *The Journal of Nursing, 41*(3), 73–78.
- Lake, W. H. (1982). *Nurse staffing based on patient classification*. Rockville, MD: Information Management Service.
- Lin, S. M., Yin, J. C., & Li, I. C. (2002). An exploration of work stressors and correlators for nurse's aides in long-term care facilities. *Journal of Nursing Research, 10*(3), 177–186.
- Liu, C. D. (1999). *The analysis of the time distribution of the nursing activity and the nursing manpower allocation in a nursing home-with the nursing home of Yunlin hospital as a case study*. Unpublished master's thesis, Youlin University of Science & Technology.
- Liu, W. P. (2001). *Establishing a cost accounting system for a nursing home by using the concept of activity-based cost accounting: A case study of hospital-based nursing home*. Unpublished master's thesis, China Medical University, Taichung.
- Mueller, C. (2002). Nurse staffing in long-term care facilities. *Journal of Nursing Administration, 32*(12), 640–647.
- Rantz, M. J., Mehr, D. R., Petroski, G. F., Madsen, R. W., Popejoy, L. L., Hicks, L. L., et al. (2000). Initial field-testing an instrument to measure: Observable indicator nursing home care quality. *Journal of Nursing Care Quality, 14*(3), 1–12.
- Rosenfeld, P., Kobayashi, M., Barber, P., & Mezey, M. (2004). Utilization of nurse practitioners in long-term care: Findings and implications of a national survey. *Journal of the American Medical Directors Association, 5*(1), 9–15.

- Shih, Y. C., Hartzema, A. G., & Tolleson-Rinehart, S. (2003). Labor costs associated with incontinence in long-term care facilities. *Urology*, 62(3), 442–446.
- Spector, W., & Mukamel, D. B. (1998). Using outcomes to make inferences about nursing home quality. *Evaluation & the Health Professions*, 21(3), 291–315.
- Su, S. (1988). The development of patient classification system from nurses' view point-literature review. *Journal of National Public Health Association (ROC)*, 8(4), 220–229.
- Takahashi, T. (2001, August). *Case management models under the implementation of Kaigo Hoke in Japan*. In H. T. Chen & H. E. Liu (Chairs), Symposium on National View in Long Care of the Elderly. Linkou Chang Gung Memorial Hospital, Taipei County, Taiwan, ROC.
- Teresi, J. A., & Holmes, D. (1992). Should MDS data be used for research? *Gerontologist*, 32(2), 148–151.

護理之家主要照護人力配置評估

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摘要：本研究以某公立醫院附設護理之家主要照護人員（護士、照顧服務員）及住民為主要研究對象，採用連續觀測法進行護理時間的資料蒐集，探討各等級健康功能住民實際所接受照護工時之差異。依據日本學者高橋泰所編製之 TAI 高齡者照護計畫視覺量表評估護理之家住民功能等級，以計算符合住民照護所需之實際護理人力。研究結果發現護理之家個案現有照護人力數尚稱充足，且部份單位人力配置有餘裕。建議未來若能建構專屬於長期照護機構住民的分類分級系統，將有助於協助機構內部人力調派與資源的合理利用，並可提升重症病人長期照護的可近性，與改善照護機構之服務品質。

關鍵詞：護理之家、人力配置、護理時間、高齡者照護計畫視覺量表。

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