Factors Affecting Long-term Care Facility Managers' Perceived Difficulties in Organizational Space Planning

Yen-Ping Hsieh

Assistant Professor, Department of Senior Citizen Service Management, National Taichung University of Science and Technology, Taiwan, R.O.C.

Abstract

This study examines the typology of the five factors affecting the space planning of long-term care (LTC) facilities in Taiwan to understand how they affect facility managers' perceived difficulty in engaging in space planning. Data were collected through questionnaires and nonlinear canonical correlation analysis (OVERALS) was used for data analysis. The results reveal that managers of leased LTC facilities experience greater difficulty in space planning than managers of facilities designed specifically for LTC use. The results also suggest that specifications and guidelines regarding space design and planning should be provided for various types of LTC facilities.

Keywords: Long-term care facilities; organizational characteristics; building characteristics; managers' characteristics

1. Introduction

The space planning of long-term care (LTC) facilities affects residents' quality of life. The design principles recommended by existing studies focus on the residential needs of the residents (e.g., homelike, small, privacy, personalization, etc.) (Barnes, 2002; Verbeek et al., 2010; Hisano and Shimizu, 2003). However, few studies have investigated whether organizations providing LTC services encounter any difficulty in planning their spaces.

It has been found that well-designed medical buildings can enhance revenue and reduce operational costs (Berry et al., 2004; Zimring et al., 2008; Furusaka, et al., 2002). Organizational characteristics are one of the factors that affect the design or reconstruction of a building. The relevant factors affecting organizational characteristics include the organization's size (Chang et al., 2007; Chao et al., 2007; Liu et al., 2006) and affiliation (Lee and Lin, 2007; Liu et al., 2006), institution type (Chang et al., 2007; Chao et al., 2007; Lee and Lin, 2007; Liu et al., 2006), organizational ownership (Chang et al., 2007; Lee and Lin, 2007; Liu et al., 2006; Shing, 2001) and mission (Lee and Lin, 2007; Shing, 2001; Shoemaker et al., 2010), cost (Chang et al., 2007; Hammond and Camp, 2011; Rodriguez et al., 2011; Sadler et al., 2008), planner (Hammond and Camp, 2011; McConnell, 2005; Rodriguez et al., 2011; Sadler et al., 2008; Shoemaker et al., 2010), building age (Shing, 2001), interior layout (Endo and Satoh, 2004; Liu et al., 2006; Nagasawa and Hwang, 2002; Kwon and Kim, 2005), and building ownership (Chao et al., 2007; Lee and Lin, 2007; Liu et al., 2006).

In particular, an organization's top management affects the success or failure of the operation (Lohrke et al., 2004). Existing studies have indicated that the professional competence, management capacity, resource management, and personal qualities of LTC facility managers are important factors affecting the service quality provided by the facilities (Burns, 2007; Campbell, 2009; Sato and Ohara, 2007; Welch, 2001).

Some studies on the reconstruction or planning of LTC facility spaces have found that management's understanding, support, and level of participation in reconstruction or space planning will affect caregivers' opinions and use of the reconstructed organizational space (Sadler et al., 2008; Okada et al., 2005; Sakata and Adachi, 2007; Sato and Ohara, 2007), thereby suggesting that the space planning of LTC facilities cannot be promoted until facility managers understand and support the project.

In Taiwan, the LTC service system is currently under development and is in the initial stage of space reconstruction, or planning, of LTC facilities. Existing studies have indicated that the planning of LTC facilities is affected significantly by policies (Pynoos, 1990). In Taiwan, the policies affecting the establishment of LTC facilities are primarily fundamental regulations on specifications, such as average floor space needed by residents, required areas (e.g., nursing stations, main halls, etc.), manpower allocation, or the establishment of barrier-free spaces (Department of Social Affairs, 2007). The government has not provided...
any guidelines or subsidies for the construction of LTC facilities. Moreover, in 2012, over 85.9% of Taiwan's LTC facilities were private (Department of Statistics, 2012), and relevant policies had yet to be formulated to assist in space planning. Consequently, the space planning of LTC facilities in Taiwan has been determined by the facilities themselves. Furthermore, the design concept of space planning in most LTC facilities in Taiwan tends to be similar to that of a medical institution; for example, the nursing station is located in the center of the facility. Although some studies have suggested that it is important for LTC facility managers to understand organizational space planning, it is still difficult to implement the design principles as recommended by existing studies (Huang et al., 2008).

Therefore, reflecting the findings of the literature review, this study suggests that five factors would affect the space planning of LTC facilities: 1) organizational characteristics, 2) building characteristics, 3) managers' characteristics, 4) managers' experience in organizational space planning, and 5) managers' perceived difficulty in space planning. The purpose of this study was to examine the typology of the five factors affecting the space planning of LTC facilities and to understand how they affect one another. The research results could be beneficial to the promotion and development of space planning in LTC facilities.

2. Data Sources and Sampling

According to statistics from various county and city governments, as of December 2009, there were a total of 1,421 registered LTC facilities in Taiwan. This study used random sampling to select the managers of LTC facilities, and questionnaires were distributed via mail; managers were defined as individuals (Robbins and Langton, 2000) that direct other people's work and oversee a number of subordinates. The various job titles of managers included head nurse, supervisor, director, president, or person in charge. A total of 630 questionnaires were distributed between January and April 2010; the researcher then followed up with six
phone calls for confirmation and personally visited the LTC facilities to collect the completed questionnaires. A total of 161 questionnaires were returned, with 151 valid samples, indicating a return rate of 24%.

3. Measures

The questionnaire content was divided into five sets. The variables and category symbols of each set are presented in Tables 1 and 2. Set A comprises organizational characteristics, including area (V1), LTC facility type (V2), organizational ownership (V3), organization affiliation (V4), organization size (V5), and years of operation (V6). Area (V1), organizational ownership (V3), organization affiliation (V4) and organization size (V5) were encoded according to the 2009 evaluation data of LTC facilities in Taiwan (Department of Statistics, 2009). Years of operation (V6) was encoded according to the quartiles of the years of establishment of the LTC facilities. However, the definitions of LTC facility types (V2) vary according to the various competent authorities in Taiwan. The Department of Health suggests that LTC facilities are nursing homes in which reside the elderly who need assistance in their daily lives, or who require tubes (catheters, tracheotomy tubes, or gastric tubes). Nursing personnel in such facilities are required to take care of the residents (Department of Health, 2011).

The Department of Social Affairs suggests that there are three types of LTC facilities: 1) long-term care centers (LTC centers) that provide services to senior citizens with long-term chronic diseases and who are in need of nursing services; 2) nursing facilities that provide services to senior citizens who lack the capability to take care of themselves, or those in need of nursing services, such as nasogastric tubes or catheters; and 3) domiciliary care facilities that provide services to senior citizens in need of care services from others, or senior citizens who can take care of themselves in terms of the requirements for daily life (Department of Social Affairs, 2007).

Set B comprises building characteristics, including building type (V7), interior layouts (V8), building ownership (V9), and renovations (V10). Building type (V7) and building ownership (V9) were encoded according to the 2009 evaluation data of LTC facilities in Taiwan (Department of Health, 2011). Interior layouts (V8) are defined on the basis of the location of the corridor on a floor with bedrooms (Huang et al., 2008; Shoji and Kurono, 2006). There were four types of corridors: 1) winding corridors, in which the corridor encircled the bedrooms around the building; 2) center corridors, in which the bedrooms were located on the sides of the corridor; 3) single corridors, in which the bedrooms were located on one side of the corridor; and 4) mixed type, in which there were more than two layouts in the design.

Set C comprises the managers' characteristics, including gender (V11), age (V12), marital status (V13), education level (V14), job title (V15), years of service at the current facility (V16), years of service in the LTC field (V17), and capital contributions or employment patterns (V18), (Chen and Kuan, 2011; Lin, 2006; Tai et al., 2008). Age (V12), years of service at current facility (V16), and years of service in the LTC field (V17) were encoded according to the quartiles.

Table 2. Basic Information of Set E Variables, Scale Type and Category Symbols: Set E

| Items | Category symbols scale type | N | Percentage |
|-------|-----------------------------|---|------------|
| 1. Perceiving the difficulty caused by the gap between policy / regulation and practical operations | V21 | 129 | 17.6 |
| v21.1 Yes | Nominal | 22 | 14.6 |
| v21.2 No | Nominal | 129 | 85.4 |
| 2. Perceiving the difficulty in achieving organizational plans | V22 | 49 | 6.7 |
| v22.1 Yes | Nominal | 102 | 67.5 |
| v22.2 No | Nominal | 49 | 32.5 |
| 3. Perceiving the difficulty in space planning and cost considerations | V23 | 124 | 17.9 |
| v23.1 Yes | Nominal | 27 | 17.9 |
| v23.2 No | Nominal | 124 | 82.1 |
| 4. Perceiving the difficulty in using the current building restrictions | V24 | 120 | 16.4 |
| v24.1 Yes | Nominal | 31 | 20.5 |
| v24.2 No | Nominal | 120 | 79.5 |
| 5. Perceiving the difficulty in meeting the requirements of barrier-free space design | V25 | 75 | 10.3 |
| v25.1 Yes | Nominal | 76 | 50.3 |
| v25.2 No | Nominal | 75 | 49.7 |

Note: sample size = 151

Table 3. Loss of the Two Dimensional Solution Within Each Set of Variables

| Sets | Dimensions | Sum |
|------|------------|-----|
|      | Dimension 1 | Dimension 2 |   |
| Loss | .267       | .304       | .571  |
| Set A | .428       | .452       | .880  |
| Set B | .346       | .398       | .744  |
| Set C | .843       | .939       | 1.782 |
| Set D | .844       | .809       | 1.653 |
| Set E | .546       | .580       | 1.126 |
| Mean | .454       | .420       | .874  |
| Eigenvalue |             |             |       |
| Fit |             |             | 1.126 |

according to the 2009 evaluation data of LTC facilities in Taiwan (Department of Health, 2011). Interior layouts (V8) are defined on the basis of the location of the corridor on a floor with bedrooms (Huang et al., 2008; Shoji and Kurono, 2006). There were four types of corridors: 1) winding corridors, in which the corridor encircled the bedrooms around the building; 2) center corridors, in which the bedrooms were located on the sides of the corridor; 3) single corridors, in which the bedrooms were located on one side of the corridor; and 4) mixed type, in which there were more than two layouts in the design.

Set C comprises the managers' characteristics, including gender (V11), age (V12), marital status (V13), education level (V14), job title (V15), years of service at the current facility (V16), years of service in the LTC field (V17), and capital contributions or employment patterns (V18), (Chen and Kuan, 2011; Lin, 2006; Tai et al., 2008). Age (V12), years of service at current facility (V16), and years of service in the LTC field (V17) were encoded according to the quartiles.
Set D comprises the managers' experience in the space planning of LTC facilities, including attending LTC facility space allocation-related courses (V19) and experience in the space planning of LTC facilities (V20) (Shoji and Kurono, 2006; Wang and Kuo, 2005; Welch, 2001). The items were encoded as either "yes" or "no."

Set E comprises the managers' perceived difficulties in the space planning of LTC facilities, and 12 items were listed, according to existing literature (Hsieh et al., 2012; Huang et al., 2008). The managers were requested to select the five items for which they perceived the highest difficulty. Then, authors selected the top five items that were most frequently chosen by the managers as being the most difficult; these represented the gap between policy/regulation and practical operation (V21), difficulty in achieving the organizational plan (V22), cost considerations (V23), building restrictions (V24), and the requirement of barrier-free space design (V25). The items were encoded as either "yes" or "no."

4. Analysis
This study used SPSS for Windows 12.0 to perform the analyses, and the mean, standard deviation, percent, and non-linear canonical correlation analysis (OVERALS) were used in the calculations. OVERALS is a technique for canonical correlation analysis using two or more sets of variables. The measurement levels of the data that can be processed by OVERALS include numerical, ordinal, and nominal, and they can be defined separately for each variable. The OVERALS technique searches for what is common among different sets of variables measured on the same objects (Geer, 1993; Van der Burg et al., 1994).

An important characteristic of OVERALS is that it does not assume that a measurement level or relationship is linear. In addition, OVERALS compares the linear relationship established for each variable with that of an unknown variable in order to construct the similarity for the variables (Geer, 1993; Van der Burg et al., 1994). OVERALS can analyze the loss index, eigenvalues, fit index, weight index, multiple fit indices, and the component-loading index established for each variable, and then draw a two-dimensional graph for each variable. This study used OVERALS in order to construct the similarity for the five sets.

5. Results
In terms of organizational characteristics (Table 1.), the main LTC facility types were nursing institutions and nursing homes. As many as 77.5% of the LTC facilities were private, while 11.3% were public. With regard to organization affiliation, most LTC facilities were independent (80.1%), followed by those that were hospital-affiliated (16.6%). The average number of beds in the LTC facilities was 65.23 (SD: 62.78 beds); however, most facilities had fewer than 49 beds (62.3%). The average years of operation were 8.84 (SD: 8.61 years), and most LTC facilities had been in operation for 5–10 years (42.4%).

In terms of building characteristics (Table 1.), the main type was a detached house (49.0%), followed by high-rise buildings (31.8%). With regard to interior layouts, the main layout had a center corridor (62.9%). With regard to building ownership, most buildings had been constructed by the LTC facilities (33.8%), followed by leased buildings that had not been originally designed as LTC facilities (33.1%). In addition, 53% of the buildings had been renovated and changed from their original design.

With regard to the managers (Table 1.), females (74.8%) outnumbered males (25.2%), and their average age was 45.9 years (SD: 10.8 years). Most were married (71.5%), and most had a college education or above (72.2%). With regard to job title, most managers were owners (37.7%), followed by directors (27.8%), and the average years of service in the current LTC facility was 6.76 years (SD: 6.0 years). The average years of service in the LTC field was 8.73 (SD: 5.72). In terms of capital contributions or employment patterns, 45% of the managers were full-time employees, and 26.5% of the LTC facilities were sole owner.

Further, with regard to experience in organizational space planning, 71.5% of the managers had not attended any courses on LTC facility space planning, nor did they have any experience in LTC facility space planning (Table 1.).

In terms of the perceived difficulties of
organizational space planning, the managers chose 5 difficulties from among 12 options, as shown in Table 2. The gap between policy/regulation and practical operation (V21) was most frequently chosen, followed by the requirement of barrier-free space design (V25) and building restrictions (V24).

The component loadings were called Dimension 1 and Dimension 2, as shown in Table 3; the eigenvalues for Dimensions 1 and 2 were 0.546 and 0.580, respectively; and Dimension 1 explained 51.9% of the relationship among the sets of variables. An actual fit value of 0.874, which was the sum of the eigenvalues, was calculated for variation.

The loadings for all variables are presented in Fig.1. The distance from the origin to each variable point approximated the importance of that variable. The component loadings were equivalent to the Pearson correlations between the quantified variables and the object scores. If the variables were located in the same quadrant, were close to one another, and were away from the center, it meant that the variables were highly correlated with one another (Geer, 1993; Van der Burg et al., 1994).

The component loadings indicated that V11 was the most effective variable in the relationships among the variable sets in Area I, and that V4 and V18 were the most effective variables in the relationships among the variable sets in Area II.
The component loadings indicated that V2, V5, V7, V8, and V15 were the most effective variables in the relationships among the variable sets in Area III. In addition, V3, V20, and V17 were the most effective variables in the relationships among the variable sets in Area IV.

Fig. 2. indicates the centroids labeled by the variables. The position of the projected centroids determined the interpretation of the direction of the variables. The specific categories for the clusters of categories in the centroid plots were determined by focusing on the directions "Area I–Area III" and "Area II–Area IV."

The organizational characteristics of Area I were those of nursing homes in Southern and Northern Taiwan that had been established for less than four years. The interior layouts comprised both winding and center corridors. The buildings were either leased or had not originally been designed as LTC facilities. Most managers were female; the main job title was owner; and most had worked at the current LTC facilities for fewer than two years. The owners perceived difficulties in the implementation of organizational plans and cost control during the space planning; however, they did not perceive any difficulty regarding barrier-free designs.

The organizational characteristics of Area III were those of non-profit organizations in Eastern and Central Taiwan as well as the islands of Taiwan, all of which had been established for over 11 years. These were domiciliary care facilities with more than 100 beds. Most of the buildings were owned and self-constructed. With regard to building type and interior layouts, they were mainly of the mixed type. Most managers were male, and their job title was primarily director. Most had worked at the current LTC facility for fewer than two years, followed by 2–10 years, and they had 4–12 years of experience in the LTC field. During space planning, the managers did not perceive any difficulty in the implementation of organizational plans and cost control; nevertheless, they perceived difficulties regarding barrier-free design.

The organizational characteristics of Area II were those of public, or publicly owned but privately run, hospital-affiliated, LTC facilities that had been established for 5–10 years and that had 50–99 beds. The primary building types were detached buildings and high-rise buildings. The interior layouts were single corridors and mixed type. The buildings were owned and had been originally designed as LTC facilities. Most managers were younger than 38 years of age, followed by those from 39–46. Most did not have a spouse and were not married. Their education level was college or above, and most had worked in the LTC field for fewer than two years. Their job titles were primarily head nurse and supervisor, and they were mainly full-time and part-time employees. The managers did not have any experience in organizational space planning; however, they did not perceive any difficulty in the gap between policy/regulation and practical operation.

The organizational characteristics of Area IV were those of small-scale private and independently operated LTC centers and nursing institutions with fewer than 49 beds. The main building type was a bungalow. As for building ownership, the land was mostly leased, and the buildings were self-constructed. The managers were generally over the age of 55, and the marital status of a majority of them was widowed, separated, or divorced. Their education level was senior high school and under. The main job title was superintendent, and they were either sole owners or partners. They had served in the LTC field for over 12 years and had experience in organizational space planning. During organizational space planning, they perceived a difficulty in the gap between policy/regulation and practical operation; however, they did not perceive any difficulty in the restrictions of the buildings.

6. Discussion

This study applied OVERALS in order to define organizational characteristics, building characteristics, managers' characteristics and managers' experience in organizational space planning, and managers' perceived difficulty in organizational space planning. The relationships and similarities among these five sets were analyzed in this study. The results from Area I to Area IV showed that the years of operation, scale, organizational type, whether the building was leased or self-constructed, interior layouts, and the managers' characteristics all had an effect on the managers' perceived difficulty in space planning.

The LTC facility organizational characteristics from Area I to Area IV were similar to those of LTC facility organizational performance. Existing studies have indicated that the factors that had a positive effect on the organizational performance of LTC facilities included a long period of establishment; large-scale, public, or NPO facilities; and hospital-affiliated facilities. In contrast, a short period of establishment, a small-scale facility, and independent operation usually had a negative effect on organizational performance (Chen, 2007; Fukizaki et al., 2005; Ku, 2011; Lin, 2006; Tai et al., 2008). The research results showed that diversified LTC facility organizational characteristics might affect the managers' perceived difficulties in organizational space planning.

The results of Area I showed that the nursing homes that had recently been established were mainly leased buildings. During organizational space planning, owing to the restrictions of the winding and center corridor layouts of the leased buildings, it was difficult for the managers to implement the plans and control costs. This study suggested that it is necessary to provide managers at LTC facilities that have recently
been established with advice concerning organizational ideas, layouts, and cost control.

Area II mainly had the characteristics of medium-scale, hospital-affiliated, LTC facilities. The original building was in use, and the interior layout was mainly a single corridor. The managers of these facilities were younger, their education levels were higher, they had not been in the LTC field for a long time, and they did not have any experience in organizational space planning. It seemed that the number of working years of the managers would affect their work experience (Chen, 2006). During organizational space planning, the managers perceived difficulties that were based on the buildings’ limitations. This study suggested that it is necessary for such facilities to strengthen their educational programs in terms of the concepts and perceptions of organizational space planning for managers.

With regard to Area III, the facilities had been established for a longer period of time, and the buildings were self-constructed. The managers did not perceive any difficulties in plans and costs during organizational space planning; however, they perceived some difficulties regarding barrier-free designs. This study presumed that residents living in large-scale facilities that had been established for a longer period of time would experience mental and physical degradation. Moreover, applicable laws and regulations governing barrier-free design in Taiwan were amended several times between 1988 and 2008 (Liao, 2010). Therefore, domiciliary care facilities have been required to renovate barrier-free spaces to meet legal requirements and residents' needs. Large-scale facilities that have been established for a longer period of time need to strengthen their understanding of barrier-free space design and improve relevant design guidelines and policies.

Area IV had the characteristics of private and independently run, small-scale nursing institutions and LTC centers. The buildings were mainly self-constructed bungalows. The managers' characteristics were consistent with the results of the study of small-scale LTC facilities conducted by Li et al. (2006). The managers were mainly older, their education level was senior high school and under, and they were sole owners or partners. During organizational space planning, the managers at such facilities perceived some difficulties from the gap between policy/planning, the managers at such facilities perceived some difficulties from the gap between policy/planning, the managers at such facilities perceived some difficulties from the gap between policy/planning, the managers at such facilities perceived some difficulties from the gap between policy/planning, the managers at such facilities perceived some difficulties from the gap between policy/planning, the managers at such facilities perceived some difficulties from the gap between policy/planning. In contrast, when LTC facilities constructed their own buildings, managers may not have encountered any difficulty in space planning. It is necessary to provide professional manpower resources for LTC facilities that have been established for a longer period of time in order to provide guidance in the maintenance, renovation, and reconstruction of buildings. Moreover, there is a conflict between the legal requirements for buildings and practical operations in LTC facilities with fewer than 49 beds.

7. Conclusion
This study found that in LTC facilities in Taiwan, there was a correlation among organizational characteristics, building characteristics, managers' characteristics, managers' experience in organizational space planning, and managers' perceived difficulty in organizational space planning. In terms of building ownership, nursing homes were usually operated using leased buildings or originally designed buildings; as a result, managers faced difficulties in organizational space planning. The other LTC facilities were mainly operated in self-constructed buildings, and, as a result, managers perceived fewer difficulties in organizational space planning. However, they had to pay attention to the relevant legal requirements for the improvement of barrier-free spaces, since the buildings were older. Moreover, managers at small-scale facilities perceived a gap between policy and practical operations, thereby suggesting that it is necessary to provide small-scale facilities with space design guidelines. LTC facility space policies should focus on the differences in the facilities and the managers' experience and perceived difficulties in order to provide measures that would be beneficial for the use and improvement of existing LTC facility buildings.

Acknowledgements
The provision of investigation data of the master's theses of Chia-Ching Lin is highly appreciated in this study. Were it not for her assistance, authors could not publish their data in scientific publications.

References
1) Barnes, S. (2002) The design of caring environments and the quality of life of older people. Ageing and Society, 22(6), pp.775-789.
2) Berry, L.L., Parker, D., Coile, R., Hamilton, D.K., O Neill, D.D. and Sadler, B.L. (2004) The business case for better buildings. Frontiers of Health Services Management, 21, pp.3-24.
3) Burns, J. (2007) Snapshots of health care managers: a measure of leadership. The Health Care Manager, 26(1), pp.68-73.
4) Campbell, R.J. (2009) Creating a winning organizational culture. The Health Care Manager, 28(4), pp.328-343.
20) Hou, C.Y. (2005) The function of activity therapy in long-term care institutions. Taiwan Journal of Gerontological Health Research, 1(2), pp.43-51.

21) Hsieh, H.Y., Hsiao, Y.W., Lin, C.C., Yen, C.W. and Chang, S.C. (2012) A study on the formation of a measurement scale for the environmental quality of Taiwan's long-term care institutions by the Delphi method. Journal of Housing and the Built Environment, 27(2), pp.169-186.

22) Huang, S.L., Liu, H.Y. and Hsu, H.Y. (2008) Research of unit care in the Medicare institution: a case study in Pingtung. NTU Social Work Review, 16, pp.129-166.

23) Ku, Y.W. (2011) The relationship between environmental factors and operational performance among nursing institutions of residential care. Taiwan: Chang Jung Christian University.

24) Lee, H.W. and Lin, T.E. (2007) Using resource-based theory to explore the competitive strength of long-term care. Journal of Sport, Leisure and Hospitality Research, 1(2), 120-147.

25) Li, I.C., Wang, C.Y., Tang, C.W., Kuo, H.T. and Yin, T.J.C. (2006) Opinions regarding accreditation items from owners of long-term care facilities versus regular psychogeriatric nursing home wards: a cross-sectional study into residents' characteristics. BMC Health Services Research, 10(1), p.30.

26) Liao, H.Y. (2010) Accessibility in senior citizens' social welfare organizations under evaluating enforcement. The Journal of Long Term Care, 14(2), pp.137-147.

27) Lin, Y.J. (2006) Organizational forms and performance of the elderly long-term care facilities in Taiwan. Taichung: Providence University.

28) Liu, T.S., Hsu, H.L., Chen, H.T., Chen, L.M., Wu, J.F. and Shu, S.C. (2006) The revision effect of accreditation system of the elderly welfare institutions and long-term care facilities in Taipei City: analysis of human resources, cost of equipment and environmental space. Taiwan Journal of Gerontological Health Research, 2(1), pp.48-63.

29) Lohrke, F.T., Bedeian, A.G. and Palmer, T.B. (2004) The role of top management teams in formulating and implementing turnaround strategies: a review and research agenda. International Journal of Performance and Strategy Research, 4(1), pp.27-48.

30) McConnell, C.R. (2005) Larger, smaller, and flatter: the evolution of the modern health care organization. The Health Care Manager, 24(2), pp.177-188.

31) Nagasawa, Y. and Hwang, B.R. (2002) Architectural study on corridor space from viewpoint of daily activities: case studies in healthcare facilities. Hokuri: Summaries of Technical Papers of Annual Meeting, Architectural Institute of Japan, pp.199-200.

32) Okada, Y., Adachi, K., Hayashida, D. and Doi, K. (2005) A study of environmental improvement system in conventional nursing homes, part 1: an action of eight institutions in Wakayama. Kinki Branch: Summaries of Technical Papers of Annual Meeting Architectural Institute of Japan, E-1, pp.385-386.

33) Pynoo, J. (1990) Public policy and aging-in-place: identifying the problems and potential solutions. In Tilson, D. (Ed.), Aging-in-place: supporting the frail elderly in residential environments (pp. 167–208). Glenview, IL: Scott, Foresman, and Company.

34) Robbins, S.P. and Langton, N. (2000) Organizational behavior: concepts, controversies, applications. New Jersey: Prentice Hall.

35) Rodriguez, M., Ford, D. and Adams, S. (2011) Does proper design of an intensive care unit affect compliance with isolation practices? Critical Care Nursing Quarterly, 34(1), pp.36-45.

36) Sadler, B., Dubo, C. and Zimring, C. (2012) The business case for building better hospitals through evidence-based design. Health Environments Research and Design Journal, 1(3), pp.22-39.

37) Sakata, M. and Adachi, K. (2007) The evaluation of care staffs considerations about environmental improvement in traditional elderly nursing home by using the Caption Evaluation Method. Kinki Branch: Architectural Institute of Japan, pp.149-152.

38) Sato, S. and Ohara, K. (2007) A study on the staff participation and consideration in repair process of nursing home: analysis of "image of unit care" and "idea of the space" read from proposal. Journal of Architecture and Planning, 619, pp.41-48.

39) Shing, S.D. (2001) Causes of the economic depression on public hospitals and the solutions. Journal of Healthcare Management, 23(3), pp.47-59.

40) Shoemaker, L., Kazley, A. and White, A. (2010) Making the case for evidence-based design in healthcare: a descriptive case study of organizational decision making. Health Environments Research and Design Journal, 4(1), pp.56-88.

41) Shoji, A. and Kurono, H. (2006) Relations between the style of traditional houses and their transprogramming into facilities for the elderly. Summaries of Technical Papers of Annual Meeting Architectural Institute of Japan, pp.363-366.

42) Tai, A.P., Chang, C.Y. and Liu, C.Y. (2008) The study of the key success factors non-profit organization: a case of a senior care center. East-Asia Review, 459, pp.75-86.

43) Furusaka, S., Kaneta, T., Miisho, T. and Akiyama, T. (2002) Client satisfaction and New Directions of Hospital Services. Journal of Asian Architecture and Building Engineering, 38(1), pp.21-36.

44) Van Der Burg, E., Deleeuw, J. and Dijksterhuts, G. (1994) OVERALS: nonlinear canonical correlation with k sets of variables. Computational Statistics & Data Analysis, 18, pp.141-163.

45) Verheek, H., Zwakhalen, S.M., van Rossum, E., Ambenberg, T., Kempen, G.I. and Hamers, J.P. (2010) Small-scale, homelike facilities versus regular psychogeriatric nursing home wards: a cross-sectional study into residents' characteristics. BMC Health Services Research, 10(1), pp.30.

46) Wang, C.H. and Kuo, N.W. (2005) Architectural evolution of long-term care facilities. Taipei City Medical Journal, 2(4), pp.311-319.

47) Welch, A.M. (2001) A forecast of competencies required for management of multiple site healthcare services: a Delphi study of managers in a Veterans Health Administration integrated system. Austin, TX: Department of Veterans Affairs.

48) Wu, P.C. (2011) A study of influencing factors policy implementation about elderly care and nursing institutions' service policy: case of six counties in central. Taichung: TungHai University.

49) Yang, P.S. (2005) The institutional care for older persons and the related social services in Taiwan. Taiwanese Social Work, 4, pp.149-166.

50) Zimring, C.M., Ulrich, R.S., Zhu, X., Dubose, J.R., Seo, H.B., Choi, Y.S., Quan, X. and Joseph, A. (2008) A review of the research literature on evidence-based healthcare design. Health Environments Research & Design Journal, 1(3), pp.61-125.