Users' Perceptions of Bedroom Privacy and Personalization in Long-Term Care Facilities

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Abstract

The purpose of this study is to understand whether the characteristics of users of long-term care (LTC) facility buildings affect their perceptions of the importance of environmental privacy and personalization of bedrooms. The building users in this study included managers of LTC facilities, residents living in LTC facilities for more than 3 months, and families visiting residents in LTC facilities. This study distributed questionnaires to the three groups of building users in order to understand their perceptions of the importance of "visual privacy," "conversational privacy," "placement of personal furniture," and "self-decoration of bedrooms" with respect to the indoor environments of LTC facilities. The results showed that number of beds, operation type, and institution type affected the privacy indicators and personalization of bedrooms and the age and marital status of residents affected their opinions of privacy. For the family members, age, marital status, and length of residence affected their perception of the importance of privacy and the personalization of institutions.

Keywords: long-term care facility; privacy; perception of importance; shared bedrooms; visual privacy

1. Introduction

Guidelines for the design of the physical environments of long-term care (LTC) facilities suggest that such design should enable the residents to have space for privacy and personalization (Burack et al., 2012; Hartmann et al., 2013; Leino-Kilpi et al., 2001; Marshall et al., 1998; Pynoos and Regnier, 1991; Weisman et al., 1991). Well-designed physical environments in LTC facilities are beneficial to residents' adaptation and quality of life (Bland, 1999). In addition, if caregivers pay more attention to residents' privacy during service procedures, care quality can be further improved (Nord, 2011).

According to a review of the literature, privacy is categorized into 1) physical privacy, the level of proximity to the body, which is reflected in personal space and the mark of individual territory; 2) psychological privacy, control over self-perception and affection, and the ability to maintain and control self-value; 3) social privacy, the management of social exchange and contact, including the frequency, length, and content of participation; and 4) information privacy, which is control over the collection and distribution of personal information (Leino-Kilpi et al., 2001). Among these four categories, physical privacy is the most important, as it affects personal autonomy, self-identity, personalization, and self-protection awareness (Gifford, 2007; Leino-Kilpi et al., 2001; Westin and Blom-Cooper, 1970).

A larger number of existing studies investigated the concept of privacy in LTC facilities from the perspective of residents' bedroom space. Residents living in shared rooms are more likely to develop territorial behavior; namely, they will use occupation and defense maneuvers to protect the territory near their beds and they may have conflicts with their roommates or develop retreating and fleeing behaviors (Foltz-Gray, 1995; Gifford, 2007; Harris et al., 2002; Hsieh, 2010; Morgan and Stewart, 1999; Sumeragi et al., 2002). As a result, guidelines on the design of physical space in LTC facilities suggest that physical isolation, such as visual and audio isolation, should be used to create personal space and protect private personal space, which is beneficial to residents' adaptation to life in these facilities (Archea, 1977; Sato et al., 2007). Moreover, the measure of providing residents with space for self-decoration or placement of personal articles can improve residents' personalized performance and help them to develop a sense of comfort and homelike attachment to LTC facilities (Becker and Coniglio, 1975; Gifford, 2007; Marshall et al., 1998; Pynoos and Regnier, 1991; Weisman et al., 1991).

Existing studies have verified that privacy and personalization are important, and some have
proposed suggestions on design to accommodate these factors. However, privacy and personalization are affected by various factors, such as personal life experiences, gender, social culture, and traditional concepts (Chan, 2000; Gifford, 2007; Hughes, 2004). Previous studies have typically used a qualitative approach to investigate the individual perspectives of three types of building users—residents, residents' families, and caregivers—and found that the intention of LTC facilities was to respect residents' privacy and personalization during service procedures (Bradshaw et al., 2012; Burack et al., 2012; Hall et al., 2013; Hartmann et al., 2013; Nord 2011). However, very few studies have used a quantitative approach to investigate how user characteristics and building properties affect opinions on privacy and personalization of bedrooms in LTC facilities in Asia.

The concepts of privacy and personalization in Chinese regions are particularly associated with the concept of filial piety, which is a virtue demonstrating respect for one's family or ancestors (Chan, 2000). In terms of living in LTC facilities, choosing an LTC facility is an important decision for both the senior citizens and their families (Huang et al., 2014). However, very few studies have investigated how the characteristics of senior citizens or their families affected their opinions regarding the privacy and personalization of LTC facilities. Moreover, most LTC facilities in Taiwan provide shared bedrooms and only a few provide private rooms (Hsieh, 2010; Huang et al., 2008; Tzeng and Wang, 2002). Managers are important personnel and oversee the quality of care at LTC facilities; however, their opinion on providing privacy and personalization in bedrooms was seldom investigated. Therefore, it is difficult to obtain the opinions of the primary users of the LTC buildings regarding the privacy and personalization of bedrooms. The understanding of such information will be an important basis upon which to develop planning measures to enhance privacy and the personalization of bedrooms in LTC facilities.

Therefore, the purpose of this study was to understand whether the characteristics of LTC facility users affect the perception of importance of environmental privacy and the personalization of bedrooms. This study aimed to understand how the differences in the characteristics of three categories of building users affected their perceptions of the importance of privacy and personalization indicators. The building users included managers of the LTC facilities, residents who had lived in LTC facilities for more than three months, and members of the residents' families (RFs) who had visited the LTC facilities.

2. Methods
2.1 Sample
This study divided building users into 1) managers including head nurses, supervisors, directors, superintendents, and owners, or those who directed others’ work and had subordinates within the organization (Robbins and Langton, 2007); 2) residents, those who had lived in LTC facilities for

| Table 1. Breakdown of the Samples |
|-----------------------------------|
| Sample | Number of questionnaires returned | Valid sample | Invalid samples | Valid return rate (%) | Number of questionnaires distributed to LFF facilities |
|--------|----------------------------------|--------------|----------------|----------------------|-----------------------------------------------|
| Total  | 630                              | 161          | 10            | 22.97                | 240                                           |
| Managers | 286                              | 284          | 2             | 99.3                | 180                                           |
| RFs    | 1284                             | 113          | 3             | 35.3                | 111                                           |
| Residents | 286                              | 284          | 10            | 95.3                | 111                                           |

Note: RFs = family members of the resident. SCWIs = senior citizen welfare institutions. NHs = nursing homes.

| Table 2. Characteristics of Building Users |
|--------------------------------------------|
| Characteristic | Manager (N=151) | RFs (N=284) | Residents (N=286) |
|----------------|-----------------|-------------|--------------------|
| Gender          | Male            | Female      | Male               |
| Type of institution | NHs            | SCWIs       | NHs                |
| Marital status  | No spouse       | Married     | Widowed            |
| Operation Style | Public facilities | Private facilities | College or above |
| Job title       | Head nurse      | Supervisor  | Director           |
| Residence       | Duration of residence | Average number of LFCs visited | Barthel Index score |
| Relationship with the residents | Spouses | Children | Relatives |
| Person paying for the LTC facilities | Residents paid | Spouses paid | Children paid |
| Diseases        | Hypertension    | Diabetes mellitus | Stork |
| Heart disease   | -               | -           | -                 |

Note: RFs = family members of the resident. SCWIs = senior citizen welfare institutions. NHs = nursing homes.
at least three months and did not suffer from any cognitive impairment; and 3) RFs, the family members of residents who volunteered to participate in this study.

The number of distributed questionnaires is shown in Table 1. From January to April 2010, this study distributed questionnaires to 676 LTC facilities in Taiwan, which can be divided into two types: 1) Nursing Homes (NHs) and 2) Senior Citizen Welfare Institutions (SCWIs). The standards regarding allocation of bedrooms for these two types of facility generally limit the maximum number of bedrooms to six. Regarding the current situation, most LTC facilities provide shared rooms while only a few provide private rooms (Hsieh, 2010; Huang et al., 2008; Tzeng and Wang, 2002). In this study, 630 questionnaires were distributed to managers at 188 SCWIs and 60 NHs. Of these, 161 questionnaires were returned, 10 of which were invalid; the valid return rate was 23.97%. Questionnaires were distributed to 286 RFs at 111 SCWIs and 69 NHs, and 284 valid questionnaires were returned; the valid return rate was 99.3%. Questionnaires were also distributed to 1,280 residents at 63 SCWIs and 48 NHs, and 480 questionnaires were returned; 286 were valid, resulting in a valid return rate of 22.34%.

2.2 Ethical Considerations

The Medical Ethics Committee of the Asia University approved this study. The closed-ended questionnaires were distributed to the LTC facilities that agreed to participate in this study for review of the content. The managers, RFs, and residents received written messages regarding the research purpose and gave their consent to participate in this study. All of the investigators received training prior to conducting this research.

2.3 Instrument

This study developed questionnaire items according to the environmental privacy and personalization of bedrooms at LTC institutions. The questionnaire included two parts. The first part inquired about the characteristics of the building users, including basic information such as gender, age, level of education, marital status, and institution type. Moreover, questions about basic information were added according to the differences in the building users.

For managers, questions were added regarding the number of beds, operation type, and job title and characteristics of managers. For residents, questions were added from the Barthel Index, which measures daily living functions (range 0–100 points; the higher the scores, the more independent the residents, and the lower the scores, the more reliant the residents are on other people's support), in addition to questions regarding the person making the payment to the LTC facility, duration of residence, and whether the resident chose the LTC facility him or herself. For RFs, questions regarding the relationship between the family member and the resident, the duration of residence, person making the payment to LTC facility, and number of LTC facilities visited before the LTC facility was chosen, were added.

The second portion of the questionnaire inquired about the respondent's perception of the importance of environmental privacy and personalization in bedrooms. According to suggestions from existing studies, it is preferable to set four indicators, including two privacy indicators, "visual privacy" and "conversational privacy," and two self-decoration indicators, "placement of personal furniture" and "self-decoration of bedrooms" (Archea, 1977; Gifford, 2007; Pynoos and Regnier, 1991; Sato et al., 2007). The second part inquired about the respondent's perception of the importance of the four indicators.

The four indicators were measured using a 5-point Likert-type scale. The scores representing the building users' perceptions of the level of importance of the environmental indicators of privacy and personalization were measured using a scale ranging from 1 (not important at all) to 5 (very important).

To verify the validity of the questionnaire, ten LTC facility operators and scholars were invited to complete questionnaires using a modified Delphi technique in order to obtain expert consensus and develop the questionnaires with expert validity between October and December 2009. Reliability was determined on the basis of Cronbach's alpha coefficient. The statistical results showed that the values of the managers, families, and residents' measured perceived levels of importance were greater than 0.86, indicating that the reliability of the questionnaire was high.

Data analysis was conducted using SPSS for Windows 12.0 as well as descriptive statistical methods such as mean, standard deviation, and percentage. This study used multiple regression analysis to analyze how the characteristics of building users affect the four environmental indicators of privacy and personalization of bedrooms.

3. Results

3.1 Characteristics of Building Users

Table 2 shows the characteristics of building users of LTC facilities. When examining the data from the managers, there were more female (74.8%) than male (25.2%). The average age was 45.9 years (SD: 10.8 years) and most were married (71.5%). Most managers held, at least, a college degree (80.1%). Most of the managers were owners (37.7%), followed by directors (27.8%). The facilities were mostly SCWIs (60.3%), followed by NHs (39.7%). The average number of beds was 64.76 (SD: 62.26 beds) and there were significant differences in the number of beds between facilities. In terms of the operation type of LTC facilities, the majority (70%) were private, followed by public (10%).

Regarding RFs, there were slightly more female (53.5%) than male (46.5%), the average age was 49.6
years (SD: 15.01 years), most were married (71.1%), and most held a college degree (39.8%). Almost two thirds (65.1%) were children of the residents, followed by other relatives (21.5%), and spouses (13.4%). Approximately 50% of the RFs of senior citizens lived in one of two types of LTC facility. The average number of beds in the LTC facilities was 69.49 (SD: 46.03). The average length of stay for residents with RFs visiting the LTC facilities was 3.02 (SD: 2.12) years. In addition, the average number of LTCs visited by RFs before their families lived in an LTC was 1.47 (SD: 1.85). The payment of fees for the 214 residents (75.35%) in the LTC facilities were mostly made by the children, followed by the residents themselves (47 residents; 16.55%), and spouses (7.04%).

There were more female residents (52.8%) than male residents (47.2%). The average age of the residents was 75.22 years (SD: 11.03 years). The average age of stay in 2010 was 3.10 years (SD: 4.7 years). Most of the residents (43%) were widowed and 33.2% were married. Most of the residents had an education below elementary school level (68.9%). Regarding the types of LTC facility, 64.7% of the residents lived in SCWIs, and 35.3% lived in NHs. Their average Barthel Index score was 58.78 points (SD: 32.28). The residents' levels of dependence regarding daily living functions were characterized as severe and moderate. More than half (57.3%) of the residents' LTC expenses were paid by children, followed by other (18.2%), and the residents themselves (16.1%); 41.6% of the residents chose to live in LTC facilities themselves, while 58.4% did not. Moreover, regarding the 14 diseases residents suffered from, most of the patients suffered from hypertension (61.61%), followed by diabetes mellitus (22.75%), heart disease (20.38%), and stroke (20.38%).

In this study, multiple regression analysis was used to investigate how the characteristics of building users affected their perceptions of importance regarding the four indicators of visual privacy, conversational privacy, placement of personal furniture, and self-decoration of bedrooms.

Regarding managers, this study applied eight variables: gender, age, level of education, marital status, institution type, number of beds, operation type, and job title, along with the characteristics of managers, as the independent variables, and a total of four indicators of privacy and personalization of bedrooms as dependent variables. The results of the regression analysis are as shown in Table 3. Results for the four indicators of privacy and personalization of bedroom space all reached the level of significance.

Regarding characteristics of managers, the explained variance of the visual privacy indicator was 26.5% (F = 2.82, p = 0.00), reaching the predictive effect. The post-hoc test on individual variables found that a larger number of beds in LTC facilities correlated with a higher perception of importance of visual privacy (β: 0.44; t = 4.71, p = 0.00). The explained variance of conversational privacy was 26.9% (F = 2.88, p = 0.00). The higher the number of beds in the LTC facilities, the more important conversational privacy was (β: 0.44; t = 4.71, p = 0.00). Compared to NHs, the perception of the importance of conversational privacy in SCWIs was higher (β: 0.46; t = 2.57, p = 0.05). The explained variance of placement of personal furniture was 46.4% (F = 6.77, p = 0.00). The higher the number of beds in LTC facilities, the greater the perception of the importance of placement of personal furniture was (β: 0.55; t = 6.97, p = 0.00). Scores representing perception of independently operated facilities was

| Independent variables | Visual privacy | Conversational privacy | Placement of personal furniture | Self-decoration of bedrooms |
|-----------------------|---------------|------------------------|---------------------------------|----------------------------|
|                       | Beta t        | Beta t                 | Beta t                          | Beta t                     |
| Number of beds        | 0.44*** 4.71  | 0.48*** 5.11           | 0.55*** 6.97                     | 0.52*** 5.86               |
| NHs / SCWIs           | -             | -                      | -                               | -                         |
| Operation type        |               |                        |                                 |                           |
| Independently operated | -             | -                      | -                               | -                         |
| Other operation types | -             | -                      | -                               | -                         |
| Note: a was reference group. Visual privacy: R square=26.5%, F=2.82, p=0.00. Conversational privacy: R square=26.9%, F=2.88, p=0.00; Placement of personal furniture: R square=46.4%, F=6.77, p=0.00. Self-decoration of bedrooms: R square=34.0%, F=4.02, p=0.00. SCWIs = senior citizen welfare institutions. NHs = nursing homes. *p < .05. **p < .01. ***p < .001.

| Independent variables | Visual privacy | Conversational privacy | Placement of personal furniture | Self-decoration of bedrooms |
|-----------------------|---------------|------------------------|---------------------------------|----------------------------|
|                       | Beta t        | Beta t                 | Beta t                          | Beta t                     |
| Age                   | 0.82*** 21.35 | 0.78*** 18.91          | 0.78*** 17.58                   | 0.79*** 17.81              |
| Marital Status        |               |                        |                                 |                           |
| Married               | -             | -                      | -                               | -                         |
| Separated / divorced  | -             | -                      | -                               | -                         |
| Note: a was reference group. Visual privacy: R square=72.5%, F=59.93, p=0.00. Conversational privacy: R square=67.8%, F=47.85, p=0.00; Placement of personal furniture: R square=63.2%, F=39.00, p=0.00. *p < .05. **p < .01. ***p < .001.
lower than that of other facilities (β: -0.55; t = -2.72, p = 0.00). The explained variance of self-decorations of bedrooms was 34.0% (F = 4.02, p = 0.00). The higher the number of beds in LTC facilities, the more important placement of personal furniture was (β: 0.52; t = 5.86, p = 0.00).

The characteristics of residents explained 72.5% (F = 59.93, p = 0.00) of the variance of the visual privacy indicator, reaching the predictive effect. Post-hoc testing of individual variables found that the older the residents, the more importance they attached to privacy (β: 0.82; t = 21.35, p = 0.00). The explained variance of conversational privacy was 67.8% (F = 47.85, p = 0.00). The older the residents, the more importance they attached to visual privacy (β: 0.78; t = 18.91, p = 0.00). Those who were married attached less importance to conversational privacy than those who had separated / divorced. (β: -0.09; t = -2.42, p = 0.00). The explained variance of placement of personal furniture was 62.9% (F = 38.63, p = 0.00). The older the residents, the more importance they attached to placement of personal furniture (β: 0.78; t = 17.58, p = 0.00). The explained variance of self-decorations of the bedroom was 63.2% (F = 39.00, p = 0.00). The older the residents, the more importance they attached to self-decorations of the bedroom (β: 0.79; t = 17.80, p = 0.00) (Table 4.).

Characteristics of RFs explained 75% of the variance of visual privacy (F = 49.95, p = 0.00), reaching the predictive effect. Post-hoc testing of individuals found that the older the residents, the more importance they attached to visual privacy (β: 0.99; t = 20.86, p = 0.00). No spouse RFs attached more importance to visual privacy relative to RFs with separated / divorced. (β: 0.16; t = 2.78, p = 0.01). The RFs who were spouses of residents attached less importance to visual privacy. The explained variance of conversational privacy was 75.0% (F = 49.82, p = 0.00). The older the residents, the more importance they attached to conversational privacy (β: 0.98; t = 20.67, p = 0.00). Compared to RFs with another marital status, single RFs also attached more importance to conversational privacy (β: 0.16; t = 2.80, p = 0.01). Spouses of residents attached less importance to conversational privacy (β: -0.10; t = -2.00, p = 0.05). The explained variance of placement of personal furniture was 77.4% (F = 57.06, p = 0.00). The older the residents, the more importance they attached to placement of personal furniture (β: 0.97; t = 20.86, p = 0.00). Compared to RFs of other marital status, single RFs also attached more importance to placement of personal furniture (β: 0.16; t = 3.06, p = 0.00). The explained variance of self-decorations of bedrooms was 78.0% (F = 59.00, p = 0.00). The older the residents, the more importance they attached to self-decorations of bedrooms (β: 0.94; t = 20.93, p = 0.00). RFs who were residents' children attached less importance to self-decorations of bedrooms (β: -0.08; t = -1.98, p = 0.05). The residents who had lived in LTC facilities for more than 3 years also attached less importance to self-decorations of bedrooms (β: -0.06; t = -2.10, p = 0.04) (Table 5.).

4. Discussion
This study investigated how the different characteristics of LTC facilities affected building users' perceptions of the importance of privacy and the personalization of bedrooms. The results showed the perceptions of three different types of building users varied according to personal characteristics.

The results concerning managers' perception of privacy and the personalization of bedrooms were identical to those of relevant studies on care quality in LTC facilities. In other words, the number of beds, organization type, and institution type, are important factors affecting falls, resident safety, labor force, and care quality (Chen et al., 2003; Chen and Pan, 2011; Flynn et al., 2010; Hwu et al., 2007). Managers who managed larger numbers of beds and took care of residents with lower levels of disability attached more importance to conversational and individual privacy indicators. Conversely, the managers of independently operated LTC facilities attached less importance to the placement of residents' personal furniture. Most LTC facilities in Taiwan are private and independently operated, thus, their spaces and resources are less suitable (Li et al., 2006). Managers of these types of LTC facility may find it more difficult to attach greater importance to personalization indicators. As a result, it is necessary to strengthen advocacy for such measures.
to increase personalization indicators in independently operated LTCs.

The results of this study showed that the age of residents was an important factor affecting the perception of privacy and personalization indicators. Moreover, married residents attached less importance to conversational privacy. Relevant studies on shared bedrooms focused on residents' territorial behavior and reactions to their roommates (Hsieh, 2010; Morgan and Stewart, 1999) and seldom investigated how characteristics of residents affect privacy and the personalization of bedrooms. The results of this study can be provided as a reference for LTC facilities that intend to develop measures to enhance privacy and the personalization of bedrooms. It is necessary for these facilities to attach importance to various factors, such as residents' age and marital status, which would be beneficial to the improvement of satisfaction with privacy and the personalization of bedrooms.

The result of RFs' perception of the importance of privacy and personalization is interesting. The personal attributes of age and single marital status in RFs had a more significant effect on the perception of importance of privacy and personalization. If RFs were the spouses of residents, they attached less importance to the concept of privacy. Children and residents who had lived in LTC facilities for longer attached less importance to the concept of personalization. RFs may have other requests for LTC facilities, such as distance between the LTC facility and home, cost, labor force ratio, clean environment, and service quality (Cheng et al., 2011; Huang et al., 2014), which may explain why RFs attached less importance to privacy and personalization indicators.

5. Conclusions

The research results showed that the characteristics of building users affected their perceptions of the importance of privacy and the personalization of bedrooms in LTC facilities. This study verified that the number of beds managed, operation type, and LTC facility type affected managers' perceptions of the importance of bedroom privacy and personalization indicators in LTC facilities. Residents' age affected their perceptions of the importance of bedroom privacy and personalization indicators. Married residents attached less importance to conversational privacy. RFs' age and single marital status affected their perceptions of the importance of privacy and the personalization of bedrooms. RFs who were residents' spouses attached less importance to the privacy indicator. Children and residents who had lived in LTC facilities for more than three years attached less importance to personalization indicators. This study may help LTC facilities to develop designs that meet the individual characteristics of building users and provide comfortable bedroom environments with personalization and high quality. Future studies could investigate residents' and RFs' perceptions of the managers' environments with respect to privacy and personalization quality or the factors affecting them.

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