ABSTRACT

Background: Although relationships among functional capacity, autonomy, and life satisfaction have been identified, little is known about how the mechanism of autonomy mediates functional capacity and life satisfaction in older adult residents of long-term care (LTC) facilities.

Purpose: The objectives of the study were to examine the relationship between functional capacity and life satisfaction in older adult residents living in LTC facilities and to test the extent to which autonomy mediated that relationship.

Methods: A cross-sectional and correlational study was conducted with a convenience sample. Two hundred twenty-eight participants were recruited from 10 LTC facilities in Kaohsiung City. Four structured instruments were used to collect data: the life satisfaction questionnaire, the Chinese version of Perceived Enactment Autonomy Scale, the Barthel Activity Daily Living Index, and a personal profile datasheet. Descriptive statistics, t-tests, analysis of variance, Pearson correlations, and both simple and hierarchical linear regression models were analyzed.

Results: Positive associations between life satisfaction and functional capacity (r = .183, p = .003) and autonomy (r = .469, p < .001) were identified. Autonomy and functional capacity were significantly correlated (r = .278, p < .001). After controlling for autonomy, the beta values reduced from .193 (p = .003) to .08 (p > .05), and the explained variance reduced from 3.7% to 0.1% between functional capacity and life satisfaction. The results indicate that autonomy is significant as a mediator.

Conclusions/Implications for Practice: To improve the life satisfaction of older adult residents of LTC facilities, facility managers and staff should develop a self-support program that encourages older adult residents to participate in physical activities and maintain autonomy.

Key Words: life satisfaction, functional capacity, autonomy, elderly residents, long-term care facility.

Introduction

Population aging is a global phenomenon (World Health Organization, 2018). Taiwan became an aging society in 1993 and an aged society in 2019 and is expected to be a super-aged society in 2026 (National Development Council, Taiwan, ROC, 2016). Advanced age is typified by declines in physical function and the increased impact of chronic diseases, resulting in high mortality rates and lower quality of life (Kimm, Sull, Gombojav, Yi, & Ohrr, 2012; Mollaoglu, Tuncay, & Fertelli, 2010). To encourage a successfully aging society, the Taiwan Government launched the “Ten-Year Long-Term Care Plan 2.0,” which emphasizes the importance of aging in place for the older adult population (Department of Planning, Ministry of Health and Welfare, Taiwan, ROC, 2019). However, the number of institutionalized older adults in Taiwan has continued to increase, from 46,297 in 2015 to 49,878 in 2019 (Department of Statistics, Ministry of Health and Welfare, Taiwan, ROC, 2019). Thus, we should take into consideration the factors that contribute to life satisfaction in older adult residents who live in long-term care (LTC) facilities.

Life satisfaction in terms of quality of life is a psychological construct that reflects individual subjective appraisals (e.g., hopes, expectations, and desires) with regard to the current situation (St. John, Mackenzie, & Menec, 2015). Thus, life satisfaction is a critical indicator of quality of care for older adult residents in LTC facilities (Cho, Martin, & Poon, 2015). With respect to older adult populations, previous studies have identified an association between functional capacity (physical ability) and life satisfaction (Borg, Hallberg, & Blomqvist, 2006; Bozkurt & Yilmaz, 2016; Jung, Muntaner, & Choi, 2010) and autonomy (Hwang & Lin, 2003; Matsui & Capezuti, 2008) as well as an association between autonomy and life satisfaction (Bangerter, Heid, Abbott, & Van Haisma, 2010; Cerejeira, Fisac, & Azenha, 2006).
Hertz, 1996). Other studies have found associations between autonomy and self-direction (a sense of being in control of one’s destiny; resources), individuality (recognizing personal needs and goals), and dependence on assistance in activities of daily life to be an internal barrier to exercising personal autonomy, according to 15 older adults residing in four nursing homes in Finland. Dependence on assistance for activities of daily life may limit the ability to make free choices and decisions and to act on personal will (Tuominen et al., 2016).

Functional Capacity and Life Satisfaction

In this study, functional capacity in terms of physical (dis)ability is defined as the degree of independence as well as dependence of physical function in 10 categories of activities of daily life (Mahoney & Barthel, 1965). The descriptive study of Bozkurt and Yilmaz (2016) identified a positive association between functional capacity and life satisfaction based on a sample of 81 older adult residents of a nursing home in South Korea. This association was also found in studies that targeted community-dwelling older adults in Sweden, Taiwan, and Turkey (Borg et al., 2006; Jung et al., 2010; Wilhelmson, Fritzell, Eklund, & Dahlin-Ivanoff, 2013). In a population-based study of 2,310 adults aged 70 years and older (Gao, 2018), activities of daily life were found to contribute positively to life satisfaction across a 12-year period based on survey data collected by the Health Promotion Administration, Ministry of Health and Welfare in Taiwan.

Covariates of Autonomy Mediation Model

Many studies in the literature have identified positive associations between being female, being young, having fewer chronic diseases, and having a shorter hospital stay length, respectively, and autonomy and life satisfaction (Borg et al., 2006; Jung et al., 2010). Therefore, this study was designed to use the mediation model to examine the covariate differences in autonomy and life satisfaction.

Methods

Design and Sample

A cross-sectional and correlational study using convenience sampling was conducted. Eligible participants were recruited from 10 LTC facilities of a 30- to 49-bed capacity located in Kaohsiung City. The inclusion criteria were as follows: age of 65 years or older, Short Portable Mental State Questionnaire score ≥ 6 (Pfeiffer, 1975), ability to read/communicate in Mandarin and/or Taiwanese, and willingness to participate. The average occupancy rate of the participating facilities was approximately 0.80 (395 × 0.8 = 316). Forty-nine residents did not meet the criteria (Short Portable Mental State Questionnaire < 6 or cannot respond to the study questions). In addition, 15 eligible participants refused to participate, and 24 withdrew before completion. Thus, 228 participants completed the survey for this study (response rate: 85.39%, 228/267).

The sample size of 228 was eligible for both simple and hierarchical linear regression models, in which two independent variables (functional capacity and autonomy) were included (Stevens, 2009).

Measures

Life satisfaction questionnaire

The life satisfaction of the participants was assessed by asking one question: “How do you feel about your life in the past 2 weeks?” Participants were instructed to identify and score their response between 1 = extremely unsatisfied and 6 = extremely satisfied.
100 = extremely satisfied, with higher scores indicating a higher level of satisfaction in daily life.

**Barthel index of activities of daily living**
The Barthel index of activities of daily living (Barthel ADL Index; Mahoney & Barthel, 1965) was used to examine the degree of independence of functional capacity in terms of the respondent’s ADL and mobility, as measured in 10 categories. The Barthel ADL Index has shown satisfactory interrater reliability (.95), test–retest reliability (.89), and concurrent validity with physical disability (O’Sullivan & Schmitz, 2007), with higher total scores indicating greater independence. Total scores of 0–20, 21–60, 61–99, and 100, respectively, represent severe dependence, mild dependence, slightly dependence, and completely independence (O’Sullivan & Schmitz, 2007).

**The Chinese version of Perceived Enactment Autonomy scale**
This study was the first use of the Chinese version of Perceived Enactment Autonomy (C-PEA) scale on an institutionalized older adult population in Taiwan to evaluate level of autonomy (Hwang & Lin, 2002). Thus, a factor analysis using principal axial factoring with promax method was carried out to determine the number of factors needed (Stevens, 2009). The results indicated that three factors, including freedom of choice (2.58, \( r = .87 \)), individualism (four items; recognize personal needs and goals), and self-direction (five items; a sense control to determine one’s actions), explained 58.20% variance.

The C-PEA scale uses a 4-point Likert design, ranging from 1 = totally disagree to 4 = totally agree, with higher domain and overall total scores indicating a higher related degree of autonomy. The Cronbach’s alpha coefficients of the three domains and overall C-PEA scale in this study were .87, .86, .84, and .88, respectively.

**Personal profile**
Demographic variables included gender, age, educational level, religion, and marital status. Other variables such as length of stay (by month) and number of chronic diseases were analyzed.

**Procedure**
Upon obtaining approval from the institutional review board and the study sites, the purposes and procedures of the study were explained to eligible participants and their families. They were informed that they could withdraw from the study without penalty at any time. After receiving informed consent, face-to-face interviews were conducted by the first author with each participant between February and June 2012.

**Ethical Considerations**
The study was approved by the institutional review board and all of the study sites (ISU-IRB-100-10).

**Data Analysis**
Data analyses were carried out using IBM SPSS Statistics Version 20 (IBM, Inc., Armonk, NY, USA). First, the descriptive statistics of all the study variables were analyzed. Second, \( t \) tests and analyses of variance were used to examine the differences in the Barthel ADL Index, the C-PEA scale, and life satisfaction among the demographic variables, respectively. Pearson correlations were used to examine the relationships among length of stay, number of chronic diseases, the Barthel ADL Index, the C-PEA scale, and life satisfaction. Finally, as the Barthel ADL Index, the C-PEA scale, and life satisfaction were intercorrelated, both simple and hierarchical linear regression models were used to examine the mediating effect of autonomy between the Barthel ADL Index and life satisfaction (Baron & Kenny, 1986).

**Results**

**Descriptive Statistics of Study Variables**
The average age of the participants was 76.76 years (SD = 8.96), ranging from 65 to 100 years, with a majority aged 65–75 years (\( n = 101, 44.3\% \)). Most were men (\( n = 116, 50.9\% \)), had an elementary or lower educational level (\( n = 179, 78.5\% \)), were religious (\( n = 213, 93.4\% \)), and lived with a spouse/partner (\( n = 142, 62.3\% \)). The average length of stay was 35.94 months (SD = 24.55), ranging from 2 to 119 months. The average number of chronic diseases was 2.05 (SD = 1.12), ranging from 0 to 5 (Table 1).

The mean score of the Barthel ADL index was 54.06 (SD = 28.93), with most of the participants reporting a moderate level of dependence (\( n = 87, 38.1\% \)). The average overall score of the C-PEA scale was 2.54 (SD = 0.58), and the average scores for the C-PEA subscales, in decreasing order, were freedom of choice (2.58, SD = 0.51), individualism (2.51, SD = 0.60), and self-direction (2.44, SD = 0.65). The average score of life satisfaction was 74.21 (SD = 11.95), ranging from 40 to 100 (Table 2).

**Sample Characteristics and Autonomy and Life Satisfaction**
No significant differences between autonomy and the demographic variables of gender, age, educational level, religion, or marital status were found. No significant differences between life satisfaction and gender, age, educational level, religion, or marital status were found. No significant associations between autonomy and age, number of chronic diseases, or length of stay were found. Finally, no significant associations between life satisfaction and age, number of chronic diseases, or length of stay were found (not shown in table).

**Autonomy Mediation Model**
Associations between life satisfaction and functional capacity (\( r = .183, p = .003 \)) and autonomy (\( r = .469, p < .001 \)) and between autonomy and functional capacity (\( r = .278,
p < .001) were identified. Thus, testing the autonomy mediation model between functional capacity and life satisfaction is rational.

The regression equations indicated that functional capacity influenced life satisfaction in this study (β = .193, p = .003; Figure 1-1.a). In addition, functional capacity influenced autonomy (β = .469, p < .001), and autonomy influenced life satisfaction (β = .278, p < .001). After controlling for autonomy, the beta values reduced from .193, (p = .003) to .08 (p > .05) and the explained variance reduced from 3.7% to 0.1% (almost zero) between functional capacity and life satisfaction (Figure 1-1.b). After controlling for autonomy, the β value and R² sharply diminished to approximately zero between the Barthel ADL Index and life satisfaction, indicating a meaningful mediating effect of autonomy (Baron & Kenny, 1986).

Discussion
To establish a safe and efficient care environment, managers of LTC facilities tend to develop official regulations/policies (e.g., physical constraints) and structured schedules (e.g., meals, bedtime, and outdoor activities) for residents (Lan et al., 2017; Sherwin & Winsby, 2010). Longer residency durations have a negative impact on the physical functioning of older adult residents, possibly because of inhibited mobility, which increases physical fragility (e.g., weakened muscle strength, increased number of falls, and declines in cognition; Candela, Zucchetti, & Magistro, 2013; Köpke et al., 2012). In addition, institutionalized older adult residents are limited in terms of activities, which reduces social connectivity and may result in lower self-worth and higher levels of loneliness and depression (Candela et al., 2013; Hacihasanoğlu, Yildirim, & Karakurt, 2012). In general, a low degree of independence correlated with lower life satisfaction among the participants, which is consistent with previous studies of noninstitutionalized older adults (Gao, 2018; Wilhelmson et al., 2013).

Approximately 90% of the participants presented some degree of ADL dependence in terms of requiring assistants (e.g., caregivers, nurse aids, or work staff) or auxiliary assistance (e.g., wheelchairs and handicap ramps) to retain mobility and deal with daily life (Bangerter et al., 2017). This supports the argument that older adult residents of LTC facilities need tailored assistance to fulfill their ADL needs and goals. As Tuominen et al. (2016) asserted, functional capacity represents an internal barrier to older adult residents living in LTC facilities that prevents them from exercising their will. Therefore, the findings of this study highlight the relationship between functional ability and autonomy.

Autonomy and Life Satisfaction
In performing one’s actions in accordance with one’s needs and goals may satisfy psychological well-being (e.g., self-identity, self-dignity, and self-actualization; Tuominen et al., 2016) as well as facilitate the exercise of personal will and
making choices that boost age value, self-respect, and dignity (Bangerter et al., 2017; Hsu, Ting, Jiang, Chien, & Chien, 2009; Tuominen et al., 2016). Therefore, autonomy was associated with the level of life satisfaction in this study, which is concurrent with the findings of previous studies (Hertz & Anschutz, 2002). However, the restricted settings limited the “will to action” (e.g., choice and determination) of the participants and their access to resources (e.g., social network and information; Bangerter et al., 2017; Tuominen et al., 2016). In addition, the participants may acknowledge certain physical limitations, as an average score of 2.54 out of 4.0 for autonomy was found in this study. This finding suggests that managers of LTC facilities should work to enhance self-determination and improve self-perceived meaning of life among residents.

This preliminary study was designed to examine autonomy as a mediator between functional capacity and life satisfaction in older adult residents of LTC facilities in Taiwan. The findings indicate that functional capacity is more significantly associated with autonomy than life satisfaction. Older adult residents may have difficulties in adapting to their residential situation or have recognized physical limitations (Dahlan, Nicol, & Maciver, 2010). A higher degree of autonomy indicates perceptions of being respected and/or participating in social relationships in daily life, resulting in better psychological well-being (Bangerter et al., 2017). Thus, functional capability was replaced by autonomy and was no longer considered as a significant contributor to life satisfaction.

Limitations

This study had several limitations. A convenience sampling technique was used to select the study participants. Thus, our findings may not be generalized to noninstitutionalized older adults or other populations (e.g., young adults). The C-PEA used in this study has a three-factor construct that is similar to previous versions that were used in studies of noninstitutionalized older adults (Hertz, 1996; Hwang & Lin, 2002). Institutionalized residents tend to live in constrained environments and thus face restricted access to resources (e.g., social network and information; Tuominen et al., 2016). All of the items that were related to access information/resources were deleted from the previous C-PEA (Hwang & Lin, 2002). Thus, the findings of this study may not be suitable for comparisons with those of previous studies. However, the findings on autonomy identified a significant relationship with functional capacity and life satisfaction, respectively, which is consistent with previous studies (Bangerter et al., 2017; Matsui & Capezuti, 2008). The life satisfaction measure used in this study was a single-question scale, which might introduce bias. Therefore, we suggest that multiple items of the life satisfaction questionnaire be used in future studies. Life satisfaction is influenced by a combination of personal, environmental, and cultural factors. However, this study focused on ADL and autonomy as part of life satisfaction in older adult residents of LTC facilities only.

Implications for Clinical Practice

On the basis of the findings of this study, maintaining and promoting functional capacity and providing opportunities to promote personal autonomy in older adult residents are strongly recommended. First, managers may implement self-support programs that reduce physical constraints and encourage activities that get participants out of their beds. A self-support program is effective in helping older adult residents maintain and promote physical function and/or prevent ADL-related declines in health (Hofmann, Schorro, Haastert, & Meyer, 2015; Köpke et al., 2012). Second, managers should encourage older adult residents to take part in a diverse range of physical activities. Physical activities are known to improve and maintain functional capabilities and prevent cognitive deterioration and depression (Grönstedt et al., 2013; Mura & Carta, 2013). Finally, staff at LTC facilities should allow residents to exercise autonomy by allowing them to express their preferences and make choices that fit with their needs and goals (Tuominen et al., 2016).
Conclusions
In summary, functional capacity, autonomy, and life satisfaction were found to be intercorrelated in this study. Furthermore, autonomy was shown to mediate the relationship between functional capacity and life satisfaction in the older adult residents living in LTC facilities. One recommendation for managers and staff is to develop self-support programs that encourage older adults to participate in physical activity and that allow them to exercise autonomy.

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Author Contributions
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