



Original Article

Effect of life-space mobility on subjective well-being in aged home-based rehabilitation users with different levels of independence in activities of daily living

YUI TOGASHI, RPT¹⁾, TAKAAKI FUJITA, OTR, PhD^{2)*}, TAKURO OHASHI, OTR³⁾, RYOHEI JINBO, RPT³⁾, RYUICHI KASAHARA, RPT, MS³⁾

¹⁾ Hobara Regional Comprehensive Support Center, Japan

²⁾ Department of Occupational Therapy, School of Health Sciences, Fukushima Medical University: 10-6 Sakaemachi, Fukushima City, Fukushima 960-8516, Japan

³⁾ Department of Rehabilitation, Kita-Fukushima Medical Center, Japan

Abstract. [Purpose] The relationship between quality of life and life-space mobility in community-dwelling older adults has recently been reported. The present study aimed to elucidate this relationship in home-based rehabilitation users with limited life-space mobility and loss of independence in activities of daily living. [Participants and Methods] The study population comprised 33 home-based rehabilitation users. The participants were expected to have a wide range of the level of independence in activities of daily living; therefore, they were categorized into three groups according to the Barthel Index score: independent (95–100 points), moderately disabled (90–65 points), and severely disabled (60–0 points) groups. We examined the relationships among the Philadelphia Geriatric Center Morale Scale, Life-Space Assessment, and Barthel Index scores and age. [Results] We detected a strong positive correlation between the Philadelphia Geriatric Center Morale Scale and Life-Space Assessment scores in the independent group; however, no significant correlations were observed in the moderately and severely disabled groups. [Conclusion] Our findings suggest a relationship between subjective well-being and life-space mobility in home-based rehabilitation users who are mostly independent in activities of daily living. However, owing to the small sample size and characteristics of the scales used in this study, further studies are warranted to verify these results.

Key words: Home-based rehabilitation, Life-space mobility, Subjective well-being

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INTRODUCTION

The main goal of rehabilitation is to improve patient quality of life (QOL)¹⁾. Patients with chronic or late-stage sub-acute phase injuries are the main users of home-based rehabilitation, which aims to support participation and interaction with local communities, improve QOL, and maintain and improve mental and physical function and independence in activities of daily living (ADL). Therefore, clarifying the factors that affect the QOL of home-based rehabilitation users is essential for developing rehabilitation strategies.

Recent studies have reported a relationship between QOL and life-space mobility in community-dwelling older adults^{2–5)}. Based on these findings, we hypothesized that QOL and life-space are also related in home-based rehabilitation users. However, to the best of our knowledge, the relationship between the QOL and life space in home-based rehabilitation users has

*Corresponding author. Takaaki Fujita (E-mail: t-fujita@fmu.ac.jp)

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not been investigated. Considering that life-space mobility is expected to differ between general community-dwelling older adults and home-based rehabilitation users with disabilities, the factors related to QOL may also differ between these groups. Therefore, it is necessary to investigate the relationship between QOL and life-space mobility in home-based rehabilitation users.

Reportedly, ADL is also considered as a factor associated with QOL in community-dwelling older adults and community-dwelling adults with disabilities⁶⁻⁹). However, several studies found no significant relationship between QOL and ADL in community-dwelling adults with disabilities¹⁰⁻¹²). Confounding results among previous studies⁶⁻¹²) suggest that other factors affect the relationship between QOL and ADL. In other words, the degree of independence in ADL may affect QOL and interfere with other variables. Therefore, it was our understanding that it is necessary to stratify and analyze participants according to their degree of independence in ADL when analyzing the variables involved in QOL.

The purpose of this study was to clarify the relationship between QOL and life-space mobility in home-based rehabilitation users according to their ADL independence levels. Although various approaches can be used to assess QOL, we selected subjective well-being as an index, which is an important concept for measuring QOL in older adults.

PARTICIPANTS AND METHODS

This was a retrospective observational study. The participants were 33 home-based rehabilitation users (15 males and 18 females) who had no significant problems with visual, auditory, or cognitive function. As for the primary illness of the participants, stroke was 18, orthopedic disease was 6, neurodegenerative disease was 4, others were 3, and unknown was 2 participants. Regarding the long-term care insurance, “certified as requiring help 2” was 3 participants, and “Long-term care level 1, 2, 3, 4, and 5” were 4, 10, 3, 5, and 2 participants, respectively (Four participants used health insurance, and 2 participants were unknown). We assessed participants using the 17-item revised version of the Philadelphia Geriatric Center Morale Scale¹³) (PGCMS) as an index of subjective well-being, the Life-Space Assessment^{14, 15}) (LSA) as an index of life-space mobility, and the Barthel Index¹⁶) (BI) as an index of ADL. The content of this study was reviewed by the Institutional Review Board of the Kita-Fukushima Medical Center and approved for implementation (No. 88-2). Because the design of our study was retrospective without intervention, the opt-out method was used instead of informed consent.

PGCMS was designed to measure perceived morale in elderly individuals aged 70–90 years. The 17-item questionnaire consists of the following three factors: agitation, attitude toward own aging, and lonely dissatisfaction. Higher scores indicate better subjective well-being, and the highest possible score is 17 points. The LSA measures life-space mobility based on the spaces participants have used in the past 4 weeks in five areas as follows: outside their bedroom, outside their house, in their neighborhood, outside their neighborhood but within their town, and outside their town. Each life-space level is allocated a sub-score based on the average weekly frequency and independence of life-space mobility. The composite score ranges from 0 to 120, with the higher scores representing greater mobility¹⁷). The BI assesses self-care, such as feeding, transfer, grooming, toilet use, bathing, walking, climbing stairs, dressing, and bowel and bladder control, on a scale of 0 (full assistance) to 100 (full independence).

We classified participants into three groups based on their BI score as follows: independent group (BI 95–100 points), moderately disabled group (BI 90–65 points), and severely disabled group (BI score 0–60 points), referring to previous studies¹⁸⁻²¹). Differences in age, PGCMS, and LSA among groups were assessed using the Kruskal–Wallis test, and a post-hoc Mann–Whitney test with Bonferroni correction was performed for items that showed significant differences. Spearman’s rank correlation coefficient was calculated to investigate the correlation between PGCMS and other variables within each group. SPSS Statistics version 25.0 was used for statistical analyses, and the level of significance was set at $p < 0.05$.

RESULTS

On the basis of their BI scores, 8 participants were categorized in the independent group, 14 in the moderately disabled group, and 11 in the severely disabled group. Table 1 shows the age, PGCMS, and LSA of participants in each group. Inter-group comparison revealed a significantly higher LSA in the independent group than the moderately and severely disabled groups ($p < 0.05$). No significant intergroup differences in age and PGCMS were noted.

Table 2 shows the correlation coefficients between PGCMS and age, BI, LSA in each group. A strong positive correlation was found between PGCMS and LSA in the independent group ($r = 0.73$, $p < 0.05$). No significant correlations were detected in the moderately and severely disabled groups.

DISCUSSION

Previous studies on community-dwelling older adults have suggested that QOL and life-space mobility are related²⁻⁵). In this study, we investigated the relationship between QOL and life-space mobility in home-based rehabilitation users who are expected to have lower life-space mobility than general community-dwelling older adults. A previous study reported an average LSA score of 69.1 points in community-dwelling older adults³). In contrast, the median LSA score in this study was very low at 20.0 points (even in the independent group, the median LSA score was 38.5 points). In a survey in Japan that

Table 1. Age, PGCMS, and LSA by ADL independence group in this study participants

	Overall (N=33)	Activities of daily living		
		Independence (N=8)	Moderately disabled (N=14)	Severely disabled (N=11)
Age (years)	75.0 (70.0–80.0)	72.0 (64.5–84.0)	74.0 (70.0–80.0)	75.0 (71.5–81.5)
PGCMS (points)	11.0 (8.0–13.0)	9.0 (7.5–14.0)	12.0 (8.0–13.0)	12.0 (8.0–13.0)
LSA (points)	20.0 (14.0–34.0)	38.5 (28.0–44.8)*†	16.0 (14.0–22.0)*	20.0 (10.5–22.0)†

Median (25–75%tile).

*†p<0.05 on pairwise comparisons.

PGCMS: the Philadelphia Geriatric Center Morale Scale; LSA: Life Space Assessment.

Table 2. Correlation between the Philadelphia Geriatric Center Morale Scale and each item

	Overall (N=33)	Activities of daily living		
		Independence (N=8)	Moderate disabled (N=14)	Severe disabled (N=11)
Age (years)	-0.06	-0.14	0.27	-0.43
BI (points)	0.04	0.23	0.11	0.50
LSA (points)	0.20	0.73 *	-0.06	0.33

Spearman's correlation coefficient with the Philadelphia Geriatric Center Morale Scale.

*p<0.05.

BI: the Barthel Index; LSA: Life Space Assessment.

assessed LSA in individuals who were certified as requiring help, the average scores of those classified as “certified as requiring help 1” and “certified as requiring help 2” were 49.4 points and 42.6 points, respectively²²). Therefore, the home-based rehabilitation users in this study have a particularly limited life-space compared with other groups.

We detected a strong positive correlation between PGCMS and LSA in the independent group. This result suggests that subjective well-being and life-space mobility are related in home-based rehabilitation users who were predominantly independent in ADL. Therefore, an approach that focuses on expanding life-space for home-based rehabilitation users who are mostly independent in ADL should be considered in addition to rehabilitation intervention focused on maintaining and improving mental and physical functions and ADL.

Alternatively, no correlations between PGCMS and LSA and BI were observed in the moderately and severely disabled groups in this study. In other words, we were unable to clarify the factors involved in the subjective well-being of home-based rehabilitation users with ADL difficulties. The abovementioned results were consistent with Kojima et al.¹², who found no significant correlation between subjective well-being (PGCMS) and ADL independence in home-based rehabilitation users. In home-based rehabilitation users requiring assistance with ADL, factors other than life-space mobility and ADL contribute to subjective well-being. In future research, additional measurement indices should be included to determine these factors.

This study has several limitations. First, our sample size was small; therefore, caution should be used when generalizing and interpreting the results. For example, in participants with a particularly low degree of ADL independence (BI <65 points), the correlation between PGCMS and BI was not statistically significant, but the correlation coefficient was 0.50. Therefore, reexamination of these relationships using larger cohorts is necessary. Second, we did not limit participation in this study or collect data on participants' diseases, making it difficult to prevent additional influences from the characteristics of each disease. Diseases and related factors are likely to have significant impacts on subjective well-being, which should be considered in future studies. Third, in the LSA scale, points are added when participants attend regular care services, which could inflate scores even if participants do not want to leave their rooms or homes. Therefore, although this study clarified the relationship between subjective well-being and life-space mobility, it did not necessarily show the relationship between life-space mobility based on the participants' will and subjective well-being. Finally, the subjective well-being assessed in this study represents only one aspect of QOL. In the future, research to overcome the above limitations is warranted.

Conflict of interest

There are no conflicts of interest.

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