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Original article

A Cross-Sectional Study on the Quality of Life among Older Adults Using Transportation-Provided Daycare Services in Rural Thailand

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Abstract

Introduction: Thailand is undergoing rapid population aging, exacerbated by a declining birthrate and rising life expectancy. However, the absence of a public long-term care insurance system and the limited availability of community-based care services, particularly in rural areas, have led to a growing number of homebound and bedridden older adults. This study aimed to investigate the relationship between utilization of daycare services with provision of transport and quality of life (QOL) among elderly individuals residing in rural areas of Thailand.

Methods: A cross-sectional study was conducted in January 2020 in Photharam District, Ratchaburi Province. The study included 30 older adults (≥60 years) who had attended the Photharam Daycare Center at least once per week for more than three months (daycare group), and 30 age- and sex-matched individuals from the same community who did not use the service (non-daycare group). Data on demographic characteristics, ADL (Barthel Index), health conditions, caregiver attributes, and QOL (WHO-QOL26) were collected via home visits. Group comparisons were analyzed using t-tests and chi-squared tests. Multivariate analysis was conducted using multiple linear regression.

Results: The daycare group showed significantly higher mean QOL scores (104.5 ± 4.7) than the non-daycare group (89.5 ± 7.6; $p < 0.001$). Multiple regression analysis confirmed that daycare use ($p < 0.001$), age ($p < 0.05$), and ADL scores ($p < 0.01$) were independently associated with better QOL outcomes. Other variables such as sex, income, education, and caregiver characteristics were not significantly associated with QOL.

Conclusion: Participation in transportation-assisted daycare services was significantly associated with higher QOL among older adults in rural Thailand. These findings underscore the importance of accessible, community-based care models in resource-limited settings. Expanding such services through locally sustainable frameworks—including community volunteers—

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could help prevent disuse syndrome and support aging in place. Future research should include longitudinal designs and incorporate broader outcome indicators such as caregiver burden and social isolation to inform policy development and optimize elder care strategies in Thailand and other aging societies.

Introduction

In recent years, the population of Thailand has undergone rapid aging, primarily due to declining birth rate and increasing life expectancy. According to the World Health Organization (WHO), as of 2016, individuals aged 60 years and older accounted for 16.5% of Thailand's total population, categorizing the country as an aged society. Furthermore, as of 2023, the country recorded a low total fertility rate of 1.21 and an elevated average life expectancy of 76.4 years, projecting an accelerating aging process[1]. Among the member countries of the Association of Southeast Asian Nations, Thailand is the second most rapidly aging nation following Singapore. Due to these reasons, developing older adult support systems in community settings has become a critical societal issue in Thailand[2].

Despite this demographic transition, Thailand lacks a public long-term care insurance system, similar to those implemented in Japan and several European nations. Consequently, the country's infrastructure for older adult care and rehabilitation services is limited. The progression of disuse syndrome among the older adults has led to an increase in the number of bedridden individuals[3]. In public hospitals, the average length of post-stroke hospitalization is only about one to two weeks, and adequate rehabilitation services are rarely available for patients after discharge. In addition, the shortage of qualified rehabilitation professionals has reduced the opportunities for home-dwelling older adults to stay physically active.

Under these circumstances, the development of safe and secure daycare services to assist older adults to remain active during daytime is critical. However, such services are scarce in Thailand. Consequently, many older adults remain confined to their homes, leading to a progressive decline in their physical function[4]. Therefore, to support functional maintenance and prevent disuse syndrome following hospital discharge, it is essential to expand community-based daycare rehabilitation services for the elderly. Scientific evaluations assessing the effectiveness of such services in Thailand are also sparse.

In light of these circumstances, we conducted a study on The Photharam Daycare Center, an elderly daycare service facility functioning in Photharam District, Ratchaburi Province, western Thailand. Established in 2017, this center aims to prevent the occurrence of disuse syndrome among bedridden older adults by providing a transportation-assisted daycare service. The center operates through donations from community residents and the sale of exercise tools produced by the older adults themselves. Volunteers primarily operate the facility, which has attracted media attention and public interest in Thailand[5].

The present study aims to provide foundational data for the expansion of older adult daycare services in Thailand by evaluating the effectiveness of the Photharam Daycare Center. Specifically, we compared the quality of life (QOL) of older adults aged 60 and above who regularly use the daycare center (daycare group) with that of older adults residing in the same community who do not use the center (non-daycare group). We conducted a comparative analysis between the two cohorts to test our hypothesis that the daycare group would exhibit significantly higher QOL scores compared to the non-daycare group.

Methods

Study Area

This cross-sectional study was conducted in January 2020 in Photharam District, Ratchaburi Province, Thailand. Ratchaburi is located approximately 100 kilometers west of Bangkok and comprises 10 districts. Owing to its distance from urban centers, many younger residents migrate to cities for employment, leading to an increasingly aged population in the province. Additionally, shortage of care personnel in the region has contributed to a growing number of bedridden older adults.

Participants and Data Collection

The daycare group composed of 30 older adults aged 60 or above who utilized the services of the Photharam Day-

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care Center at least once a week for more than three months and who exhibited no signs of dementia.

The non-daycare group consisted of 30 older adults aged 60 or above residing in the same region who did not use the daycare service. The participants in this group were matched one-to-one with those in the day-care group based on five-year age brackets and sex[6]. Participant selection was mainly carried out by a nurse affiliated with the day-care center, and informed consent was obtained from both the participants and their families.

Home visits were conducted to administer the survey. For each participant, the following baseline data were collected: sex, age, number of cohabiting family members, monthly household income (in Thai Baht), activities of daily living (ADL) measured using the Barthel Index (maximum score: 20 points), educational attainment, health conditions (presence or absence of hypertension, diabetes mellitus, stroke, hearing impairment, and visual impairment), and characteristics of the primary caregiver (sex, age, and presence or absence of ADL limitations).

To assess the QOL, we used the Thai-language version of the WHO-QOL26 tool developed by the WHO. This instrument comprises 26 items across four domains—physical health, psychological well-being, social relationships, and environment—in addition to two general items related to overall QOL and health status. Participants self-rated their condition in the two weeks preceding the assessment on a five-point Likert scale[7].

Statistical Analysis

Descriptive statistics for the variables of age, number of cohabiting family members, Barthel Index scores, household income, caregiver age, and QOL scores were recorded as mean ± standard deviation (SD). Data on educational attainment, health status, and caregiver characteristics were recorded as frequencies and percentages. Comparisons between groups to determine statistical significance were conducted using t-tests or chi-squared tests.

QOL scores were used as the dependent variable for multivariate analysis, which was conducted using multiple linear regression. Model 1 analyzed the following independent variables related to the participants: day-care use (yes/no), sex, age, ADL score, health conditions (hypertension, diabetes, stroke, hearing impairment), and education level. Model 2 analyzed additional variables related to caregivers, including number of cohabiting family members, household income, caregiver relationship, age, and ADL limitations. A p-value of <0.05 was considered statistically significant. All analyses were performed using IBM SPSS Statistics for Windows, Version 22.0 (IBM SPSS Japan Inc.).

Ethical Considerations

This study was approved by the Ethics Committee of Juntendo University Faculty of Medicine (Approval No.: JMF-2019068). All participants were provided with a detailed explanation of the study's purpose and content, and written informed consent was obtained from them before participation.

Results

Participant Characteristics

Table 1 presents the baseline characteristics of the participants. Both the groups comprised 9 males and 21 females, matched by sex and age. The average age was 73.5 ± 7.7 years for the daycare group and 73.8 ± 8.2 years for the non-daycare group, with no significant difference between the groups.

The age distribution of the daycare group was as follows: 60-64 years (1 male, 4 females), 65-69 years (1 male, 4 females), 70-74 years (3 males, 3 females), 75-79 years (2 males, 2 females), 80-84 years (2 males, 7 females), 85-89 years (none), and 90-94 years (1 female). The participants in the non-daycare group were selected to match the age and sex composition of those in the daycare group.

The ADL scores according to the Barthel Index were 16.1 ± 4.2 for the daycare group and 17.0 ± 1.1 for the non-daycare group, with no significant difference between the groups. Most participants in both groups required minimal assistance to perform their daily activities.

In terms of educational attainment, most individuals in both the groups had completed only elementary school, and no significant differences were observed between the groups in this regard either. Although the daycare group reported higher household income, variability in self-reported income made precise comparison challenging.

Regarding health status, both groups exhibited high prevalence of hypertension and diabetes—especially hypertension, which affected approximately 70%—with no significant differences between the groups. However, a significantly higher proportion of the daycare group re-

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Table 1. Characteristics of the participants

Variables	Day-care Group	Non-day-care Group	p-value
n	30	30	—
Sex (Male: Female)	9:21	9:21	—
Age (range 60–91)	73.5 ± 7.7	73.8 ± 8.2	0.871
Number of cohabiting family members	2.8 ± 1.4	3.3 ± 1.6	0.200
ADL (Barthel Index, max score = 20)	16.1 ± 4.2	17.0 ± 1.1	0.297
Monthly household income (THB)	18,330 ± 20,518	10,183.3 ± 7,412.1	**0.046***
Educational Attainment			0.211
No formal education	3 (10.0%)	1 (3.3%)	
Primary school	24 (80.0%)	26 (86.7%)	
Junior high school	2 (6.7%)	2 (6.7%)	
High school	0 (0.0%)	1 (3.3%)	
University	1 (3.3%)	0 (0.0%)	
Health Conditions			
Diabetes	12 (40.0%)	9 (30.0%)	0.589
Hypertension	21 (70.0%)	23 (76.7%)	0.771
Stroke	6 (20.0%)	0 (0.0%)	**0.024***
Hearing impairment	1 (3.3%)	0 (0.0%)	1.000
Visual impairment	0 (0.0%)	0 (0.0%)	—
Primary Caregiver Characteristics			0.089
Spouse	6 (20.0%)	13 (43.3%)	
Son	3 (10.0%)	5 (16.7%)	
Daughter	14 (46.6%)	6 (20.0%)	
Sibling	5 (16.7%)	2 (6.7%)	
Grandchild	2 (6.7%)	2 (6.7%)	
No caregiver	0 (0.0%)	2 (6.7%)	
Caregiver age (years)	53.0 ± 14.4	59.1 ± 12.9	0.099
Caregiver with ADL limitations	6 (20.0%)	0 (0.0%)	**0.024***
QOL (WHO-QOL26 score	104.5 ± 4.7	89.5 ± 7.6	**< 0.001*****

Notes: * $p < 0.05$ is considered statistically significant. *** $p < 0.001$ is considered highly significant.
Abbreviations: QOL Quality of Life; ADL Activity of Dayliy Living; THB Thai Bath

ported a history of stroke ($p = 0.024$).

As for caregiver characteristics, daughters or siblings were more frequently the primary caregivers for individuals in the daycare group, whereas spouses were the more common primary caregivers in the non-daycare group. However, this difference was not statistically significant. Average caregiver age was 53.0 ± 14.4 years in the daycare group and 59.1 ± 12.9 years in the non-daycare group. A higher proportion of caregivers in the daycare group had ADL limitations ($p = 0.024$).

The average QOL score as determined using WHO-QOL26 was significantly higher for the daycare group (104.5 ± 4.7) compared to the non-daycare group (89.5 ± 7.6; $p < 0.001$).

Multiple Regression Analysis

Table 2 presents the results of the multiple regression analysis, in which the QOL scores were treated as the dependent variable. In Model 1, the variables significantly associated with QOL were daycare usage ($p < 0.001$), age ($p = 0.009$), and ADL score ($p = 0.005$). Sex, health conditions, and educational attainment were not significantly associated with QOL.

Model 2 was also characterized by significant associations of QOL with daycare use ($p < 0.001$), age ($p = 0.024$), and ADL score ($p = 0.004$). None of the additional variables reached statistical significance.

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Table 2. Multiple Regression Analysis Using QOL Scores as the Dependent Variable

Model Variables	Model 1		Model 2	
	β	p-value	β	p-value
Day-care usage (yes vs. no)	0.720	**<0.001*** **	0.652	**<0.001*** **
Sex	0.036	0.652	-0.082	0.451
Age	-0.245	**0.009***	-0.317	**0.024***
ADL score	0.277	**0.005***	0.338	**0.004***
Health Conditions				
Diabetes	-0.069	0.409	-0.081	0.415
Hypertension	0.081	0.286	0.105	0.225
Stroke	-0.008	0.938	0.045	0.708
Hearing impairment	-0.035	0.650	-0.059	0.535
Educational Attainment				
No formal education (reference)	—	—	—	—
Primary school	-0.205	0.103	-0.147	0.339
Junior high school	-0.040	0.690	-0.024	0.837
High school	-0.223	**0.009***	-0.284	**0.007***
University	0.079	0.454	0.053	0.680
Number of cohabiting family members			0.075	0.438
Monthly household income (THB)			0.057	0.615
Primary Caregiver Characteristics				
Spouse (reference)			—	—
Son			0.121	0.438
Daughter			0.180	0.307
Sibling			0.112	0.345
Grandchild / No caregiver			0.255	0.099
Caregiver age			0.135	0.416
Caregiver with ADL limitations			0.088	0.443

Notes: Model1: Age, ADL score, Health Conditions, Educational Attainment, Model2: Model1 plus Number of cohabiting family members, Monthly household income, Primary Caregiver Characteristics, Caregiver age, Caregiver with ADL limitations

* $p < 0.05$ is considered statistically significant. *** $p < 0.001$ is considered highly significant.

Abbreviations: β standardized partial regression coefficients, QOL Quality of Life; ADL Activity of Dayliy Living; THB Thai Bath

Model statistics: Model 1: Adjusted $R^2 = 0.689$, $F = 11.883$, $p < 0.001$: Model 2: Adjusted $R^2 = 0.665$, $F = 6.66$, $p < 0.001$

Discussion

This study represents the first cross-sectional investigation to evaluate the QOL among older adults utilizing transportation-assisted daycare services in Photharam District, Ratchaburi Province, Thailand. Declining birth rate and increased life expectancy have led to substantial progression of population aging in Thailand. Consequently, the need to establish comprehensive care, health, and welfare systems for older adults[1].

In this study, we compared the QOL scores of older adults aged 60 and above who used a daycare center regularly for over three months (daycare group) with that of their peers matched by age and sex who did not use such services (non-daycare group). The findings revealed significantly higher QOL scores in the daycare group, suggesting a potential beneficial impact of transportation-assisted daycare services on older adults' well-being. These findings support our hypothesis that participation in daycare services is significantly associated with QOL among older adults.

Our multiple regression analysis also revealed that, in addition to daycare service usage, age and ADL function

were significantly associated with QOL. This implies that maintaining a certain level of physical independence while participating in community-based activities is vital for the well-being of older adults.

Analysis of caregiver characteristics revealed that daughters or siblings were more likely to serve as caregivers in the daycare group, while spouses were the more common caregivers in the non-daycare group. This pattern may be due to differences in caregivers' employment status and caregiving dynamics. For instance, employed family members may utilize daycare services to alleviate the burden of daytime caregiving. In contrast, spousal caregivers may perceive themselves as primary caregivers and be less inclined or able to make use of external services.

In terms of education, most participants in both groups had completed only elementary school. This aligns with the historical educational policy in Thailand, wherein compulsory education was extended to lower secondary school only in 1992, by which time the participants must have crossed schooling age[8]. Therefore, most individuals aged 70 and older today did not benefit from the extended schooling policy. While education level did not have a significant impact on the QOL, the relatively low level of educational attainment suggests the importance of tailored instruction and health education in daycare settings.

Thailand currently lacks a national long-term care insurance system[1], and rehabilitation services provided in hospitals are often brief and limited. For instance, stroke patients are typically discharged within one to two weeks[2], raising concerns about the adequacy of post-discharge rehabilitation support. Without ongoing opportunities for physical activity, older adults may develop disuse syndrome, characterized by muscle weakness, joint contractures, and cognitive decline, ultimately increasing the risk of becoming bedridden. This risk is particularly acute in rural areas like Ratchaburi Province, where medical access is more limited and public transportation is underdeveloped. In such settings, the transportation component of daycare services is especially critical for accessibility[4].

In contrast, Japan has widely developed daycare services under its national long-term care insurance system, which provide daily care and foster social participation and independence among older adults[9]. Many studies in Japan have demonstrated that community engagement among older adults is associated with reduced risk of physical decline and dementia[10][11]. Similar to Japan, many developed countries have adopted daycare or day-service models that include not just in-facility care, but also opportunities for interpersonal interaction, social inclusion, and greater independence[12].

Similar studies conducted in other countries—such as those examining daycare centers for individuals with dementia in Norway and daycare centers in Brazil—have also reported higher QOL among users of such services[13][14]. However, given the differences in economic conditions and healthcare systems, making direct comparisons between these countries and Thailand may not be appropriate. Nonetheless, this study can serve as a foundation for future research that goes beyond QOL scores to evaluate variables such as changes in ADL, caregiver burden, and levels of depression or social isolation. Identifying effective service components through such multidimensional evaluations is crucial for designing optimal daycare services in Thailand.

As demonstrated in the present study, even under budgetary constraints, sustainable models for daycare services can be achieved by leveraging local human resources, such as community health volunteers[2][5]. Future policy efforts to expand daycare services in Thailand should consider these locally adaptable and resource-conscious frameworks.

Population aging presents significant challenges in Japan as well, including a growing number of long-term care insurance users and increasing cases of social isolation and solitary deaths[15]. To tackle this issue, Japan has promoted the concept of a community-based integrated care system to support older adults; however, in modern society—where neighborhood connections are increasingly weak—fostering cohesive communities can be challenging. Care managers play a pivotal role in this system, particularly in incorporating informal services into care plans[16][17]. In contrast to Japan, Thailand still maintains relatively strong community ties and has an extensive network of local health volunteers[2]. Therefore, the Japanese model of integrated care can offer valuable insights for Thailand's policy development. Likewise, Thailand's preserved community structure could offer valuable lessons for other aging societies. Japan can draw insights from Thailand's approach to utilizing limited professional and financial resources effectively to support its older

adult population.

Older adult support systems reflect a country's cultural values and views on life and death[18]. Japan, which is the most rapidly aging society in the world, has published a wealth of research on geriatric care[19)20)]. However, the solution that worked for one country cannot be expected to work identically across all countries worldwide. Therefore, through international collaboration and mutual understanding, countries can learn from one another's experiences and develop contextually appropriate, evidence-based older adult care services.

This study has several limitations. First, the sample size was small, which may weaken the statistical power of the findings. Second, the analysis did not account for differences in frequency of daycare usage, which may affect outcomes—the experience of those using the service once a week is likely to differ significantly from those availing the service five times a week. Therefore, we suggest future studies to consider frequency of use as an independent variable. Third, the study relied solely on QOL as an outcome measure. Fourth, rigorous matching methods, such as propensity score matching, were not applied.

Future research can incorporate broader indicators, such as caregiver burden, depression symptoms, and degrees of social isolation. Finally, since this was a cross-sectional study, causality could not be established. Longitudinal studies need to be conducted to analyze long-term effects.

Conclusion

This study found that the use of transportation-assisted daycare services is significantly associated with higher QOL among older adults residing in rural areas of Thailand. To expand and institutionalize such services, it is essential to develop sustainable operational models that effectively utilize community resources. Furthermore, continued research is necessary to evaluate the multidimensional impact of these services on both users and caregivers, thereby contributing to the development of comprehensive and culturally sensitive elder care framework in Thailand.

Funding and conflict of interest

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