# 学 位 論 文 の 要 旨

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学 位 論 文 名　Effects of Shopping Rehabilitation on Older People's Daily Activities

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## 論 文 内 容 の 要 旨

### INTRODUCTION

In aging societies, the deterioration of physical and cognitive functions of older persons has become a paramount concern, which is related to older people's motivation to engage in rehabilitation. Several systematic reviews of older people (aged 65+ years) report that regular exercise improves physical and cognitive functions. Providing exercise rehabilitation to older people can contribute to maintaining their physical and cognitive functions, and rehabilitation may increase the ability to stay healthy. However, the motivation for rehabilitation varies depending on the person. As a method to overcome this issue, the concept of a nudge for human behavioral changes is becoming popular. Shopping can be used as a nudge for rehabilitation, which could drive rehabilitation among older people. This is known as "shopping rehabilitation", which allows older people to enjoy shopping and naturally engage in rehabilitation. In this rehabilitation process, persons who find it difficult to leave their home and require support visit a commercial facility by being picked up from their homes and engaging in rehabilitation, as exercise is added to the shopping experience using a cart dedicated to rehabilitation. This study clarified the effects of shopping rehabilitation on the motor and cognitive functions of older persons.

### MATERIALSAND METHOD

This study used a semi-experimental method with older people who participated in a shopping rehabilitation program in Unnan City, Japan, from June to December 2020. Marcherises, where this study was conducted, is the largest commercial facility in Unnan City,

and many older people visit the area daily for shopping. Those eligible for shopping rehabilitation had one or more Kihon Checklist scores available; the Japanese government constructed the checklist to detect people that required possible care. Regarding the shopping rehabilitation, 95% of the participants used shuttle cars to travel from their homes to commercial facilities. After clerks performed health checks, such as assessments of blood pressure, pulse rate, and temperature in the reception area, nine to 12 participants moved around the facility while following the instructions of two occupational therapists (OT). Rehabilitation using the special shopping cart was performed for 30 min, followed by 60 min of gymnastics conducted in the Hikari Salon on the second floor which can accommodate more than 20 participants, followed by a second 30 min shopping session. Therefore, one complete session lasted approximately 120 min in total. The shopping rehabilitation was held four times a month on average. Changes in Kihon Checklist scores before and after shopping rehabilitation, which were shown to correlate with prognosis, were measured. The Kihon Checklist was collected and compared before participation and six months after engaging in shopping rehabilitation. It was developed as a screening method to detect older people who were at high risk of requiring long-term care. It consists of 25 questions grouped into seven areas: daily life, motor function, nutrition, oral function, withdrawal, cognitive function, and depressed feelings. The prior literature shows that a score of 8 or higher is associated with reduced future independence and survival. Values before and after participation in shopping rehabilitation were used as the independent variable. We used a questionnaire to collect the background data of participants. The contents were age, gender (male and female), medical history, family structure (living with family or living by oneself), dependency status (0: independent, 4: highly dependent), level of dementia (0: no symptoms, 4: severely impaired), housing environment (detached house or apartment), and history of smoking and drinking. Based on the participant's medical history, a Charlson Comorbidity Index (CCI) score was calculated for each participant to assess the severity of their medical conditions. The participants were categorized into two groups—those with families and those living independently—to investigate the differences in demographic data related to isolation. Student's t-test was used to assess parametric data, and the Mann–Whitney U test was performed on non-parametric data. Differences were assessed in the pre-and post-intervention proportions of total Kihon Checklist scores $\geq$ 8. The study protocol was approved by the Research Ethics Committee of Unnan City Hospital.

## RESULTS AND DISCUSSION

In June 2020, 72 older people participated in shopping rehabilitation and answered the Kihon Checklist. Finally, 59 participants answered the Kihon Checklist in December 2020 after the intervention. The mean age of participants in this study was 86.32 years (standard deviation =

4.67), with 93.2% being female. There was no significant difference in the background data between groups living independently and with families. During the 6-month intervention period, the number of participants with a checklist score of 8 or higher was significantly reduced after the intervention ($p = 0.050$). In the sub-analysis, the score improved significantly for the group with families ($p = 0.050$). Improvement was observed in the group living alone, but the difference was not significant ($p = 0.428$). During this period, no apparent adverse events due to the rehabilitation were observed. This study shows that incorporating the element of shopping into rehabilitation can improve the Kihon Checklist score. The improvement of the Kihon Checklist score shows the effectiveness of shopping rehabilitation, depending on living situations. Shopping rehabilitation contains physical and cognitive training factors during shopping, which can contribute to improving the score. Furthermore, participants with families improved their scores significantly. This improvement might correlate with their living conditions. Older people often receive help from their families, so they may lose the opportunity to go shopping by themselves. In contrast, in this study, a higher proportion of participants living alone had a checklist score of 8 or higher and did not improve in physical or cognitive function through the shopping rehabilitation. Since such persons lack help in their daily life, they might not collect their utilities and groceries themselves. Furthermore, isolation can promote health issues such as frailty. This can limit an individual's ability to travel and communicate with others, which might lead to further deterioration in their physical and cognitive functions. In this research, most participants were female, which is likely related to their previous routine in a rural context. In rural regions, the woman's role is often housework, including purchasing groceries. However, as women age, they may be unable to go shopping because they lack access to shopping malls. Through shopping rehabilitation, they could begin shopping again, and thus engage in physical movement with the support of rehabilitation specialists. This study had several limitations. First, as it was performed in a single shopping mall located in a Japanese rural area, the study's setting may not be applicable to older people in all developing and developed countries. Another limitation pertains to the sampling method. Possible confounding factors were considered in this study; however, the randomization of the sampling process could further address potential confounds.

## CONCLUSION

The shopping rehabilitation intervention improved Kihon Checklist scores. Continuous observation and research are needed to measure the long-term effects of shopping rehabilitation on participants, regarding not only improvements in physical and cognitive abilities but also loneliness, the mechanisms that foster health maintenance, and other potential impacts.