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Difficulty and Anxiety for Older Patients with Osteoarthritic Knee When Using Public Transportation

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Abstract

The difficulty and anxiety involved in using public transportation are barriers for older adults.The purpose of this study was to describe the difficulty and anxiety experienced by older adult knee patients when using public transportation. Participants were limited to outpatient knee patients over 65 years old. A self-reported "Questionnaire for older limb osteoarthritis patients using public transportation" and the Oxford Knee Score (OKS) were used. Effective responses were obtained from 93 participants. Domains that showed increased difficulties were [Taking big steps is difficult when getting on trains and buses] (76.3%) and [Cannot quickly avoid the crowd getting off at steps] (69.9%). More anxiety domains were related to falling: [The shaking of vehicle might make me fall] (66.7%), [I might fall from the station's steps] (65.6%).The mean OKS was 24.1. Patients were divided into 2 groups: under 23.0 points (good) and over 24.0 points (poor). There were significant differences between the two groups in the domains [Cannot quickly avoid the crowd getting off at stations] ($p = .0009$) and [I might fall from the station's steps] ($p = .0364$).We found that older adult knee patients face difficulty and anxiety when using public transportation. We could also see that the patients with poor OKS tended to experience more difficulty and anxiety when using transportation.

Key Words

Older adult knee patients, Transportation, Difficulty, Anxiety

BACKGROUND & PURPOSE

Due to the increase in the aging population in Japan, the percentage of young-old individuals (65–74 years old) is now 11.9%, and that of old-old individuals (over 75 years old) is 11.2%. Compared to the rest of the world, Japan is facing the beginning of an unexplored aging society[1)]. Japanese governmental legalization has declared that

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every older adult has the right to have his or her daily-life activities maintained, health decline prevented, and self-realization supported. It is expected that older adults can live a long, independent life[2].Older adults typically start experiencing pain and limitations in their range of motion caused by joint osteoarthritis triggered by aging. Joint osteoarthritis in lower limbs affects their gait, decreasing their tendency to leave home. Reduced activity, both physical and mental, enhances risk for disuse atrophy. It is also reported that even those older adults living at home are forced to stay in by the pains in their legs[3]. Recently, the number of knee osteoarthritis patients has been increasing. It is reported that there are 10 million patients with subjective symptoms and 30 million with latent osteoarthritis. The numbers are expected to grow as aging society progresses[4]. In addition, the increase in knee patients is causing an increase in knee arthroplasty surgery annually[5], with the current figure at 70 thousand per year. Since 19.4% of older adults requiring support are osteoarthritis patients, intervention is thought to be important for those with disorder of physical activity in order to decrease the number of patients requiring support and care[6].It has also become clear that community-dwelling older adults showing independence in activities of daily living (ADL) still have difficulty leaving home on their own and using public transportation[7].

Similarly, going out is necessary for older adult patients to live daily life independently. However, there are almost no reports on the current circumstances of public transportation use focusing on older adult patients with knee osteoarthritis affecting their walking.Therefore, the purpose of this study was to describe the difficulty and anxiety experienced by older adult knee patients when using public transportation and to show the measures they take to keep themselves safe.

METHODS

This was a quantitative study of the actual circumstances of older adult lower limb joint patients using public transportation.

1. Participants

Participants were limited to outpatient knee and hip patients of a hospital in the Kansai area who were over 65 years old and could use the bus or train on their own.

The patients with joint problems were clarified by a doctor. A questionnaire was to be filled in by the patients, but for those who found it difficult, we allowed their

family members to write on their behalf. Dementia patients were excluded.

1. Questionnaire

We developed a questionnaire that provided us with a clear grasp of the current circumstances of older adult patients with lower limb osteoarthritis concerning their outings, public transportation use, and associated difficulty and anxiety. We considered previous studies focusing on the transportation problem for older adults[3),8),9)]. The questionnaire also includes original ideas and measures taken to facilitate public transportation use. Upon creating the questionnaire, we interviewed 5 female orthopedic outpatients aged 60 to 70 years old. Based on the interviews and the opinion from the orthopedic researchers, we modified the questionnaire. The questionnaire was finalized through a pilot study focusing on 1 male and 3 female patients aged 70 to 80. The participants requested larger font for easier reading, so we changed the font size of the questionnaire. The title of questionnaire was "Questionnaire for older lower limb osteoarthritis patients using public transportation."

1) Demographic Characteristics

The collected demographic characteristics were Age, Sex, Name of disease, Experience of lower limb surgery, and Type of surgery.

2) Public Transportation Use

Participants were asked how they prepare outfits when going out, difficulties and anxiety-causing aspects when using transportation, creative measures they take when using transportation, and requests they have toward the public transportation system.

3) Oxford Knee Score

The Oxford Knee Score (OKS) is a questionnaire for knee patients. We used it with our knee patients. It has a Likert scale of up to 5 and scores ranging from 12 to 60 with lower scores corresponding to better knee health. The OKS is a self-reported patient questionnaire that addresses the patient's assessment of knee function and its effect on quality of life.[10),]

The OKS is constructed from the following questions about knee pain and ADL-related knee movement during the past 4 weeks:

① How would you describe the pain you usually have from your knee?

② Have you had any trouble with washing and drying yourself (all over) because of your knee?

③ Have you had any trouble getting in and out of a car or using public transport because of your knee? (Whichever you would tend to use)
④ For how long have you been able to walk before pain from your knee becomes severe? (with or without a stick)
⑤ After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your knee?
⑥ Have you been limping when walking, because of your knee?
⑦ Could you kneel down and get up again afterwards?
⑧ Have you been troubled by pain from your knee in bed at night?
⑨ How much has pain from your knee interfered with your usual work (including housework)?
⑩ Have you felt that your knee might suddenly 'give way' or let you down?
⑪ Could you do the household shopping on your own?
⑫ Could you walk down one flight of stairs?

2. Data Collection

Of the participants, those who consented to cooperate with the research were asked to complete the questionnaires during their waiting time or after their outpatient visit. The forms were submitted in a collection box. The data were collected from August to October, 2011.

3. Data Analysis

Statistical analysis was descriptive and chi-square test.

4. Ethical Considerations

This study was approved by the ethics committee of the Kobe University Graduate School of Health Sciences. The following content, including the explanations about the research content, purpose, and methods, was given to all eligible patients verbally and in written form: (1) Forms were to be submitted anonymously; (2) Participation and retirement was voluntary, and non-participation did not affect negatively further treatment; and (3) Obtained data would only be used for research purposes and would be coded to protect personally identifiable information. Only those who provided consent were enrolled.

RESULTS

Questionnaires were collected from 113 out of 147 participants. One patient did not complete the questionnaire; 19 were hip patients, and 93 were knee patients. We analyzed data from 93 knee patients (6 males, 87 females: mean age 77.5 ± 5.6 years old). Of these, 88 patients (94.6%) had knee osteoarthritis, 71 (76.3%) had undergone surgery (artificial knee joint replacement was the majority with 53 patients [57.3%]), and 22 had undergone conservative treatment (Table 1).

As for their attire when going out, 93.5% chose shoes comfortable to walk in, 83.9% chose clothes that were easy to move in, and 73.1% chose bags that allowed their hands to be free.

Participants encountered a high level of difficulty with the following: “Taking big steps is difficult when getting on trains and buses” (76.3%), “Cannot quickly avoid the crowd getting off at stations” (69.9%), “Vehicles’ severe shaking makes it difficult to maintain balance” (57.0%), “Lack of handrails after getting off trains and buses makes it difficult” (52.7%).

Most of what gave them high levels of anxiety had to do with falling: “The shaking of the vehicle might make me fall” (66.7%), “I might fall from the station’s stairs” (65.6%), “I might stumble on the step to the bus” (65.6%), and “I might bump against other passengers and fall” (53.8%). Concerns for others could be seen in the following answers: “My slow walking might annoy other passengers” (65.6%) and “My cane might hit other passengers in the small space” (50.5%).

They reported taking the following measures: “Try to use the escalator whenever I can” (87.1%), “Try to use the elevator whenever I can” (84.9%), “I give myself plenty of time to get to the destination because I walk slowly” (82.8%), “I try to grab the handrail instead of the strap” (77.4%), and “I try to stand against the walls of trains and buses” (61.3%). As for their requests for the public transportation system, improvements of facilities and considerations from drivers and passengers were hoped for: “There should be more Western-style toilets in stations (instead of Japanese-style crouching ones)” (71.0%), “There should be more escalators and elevators in stations” (68.8%), “There should be more seats in the waiting areas of stations” (59.1%), “The young and the physically unimpaired people should give their seats to ones who are not” (55.9%), “Drivers should make sure everyone is seated before starting the bus” (53.8%), “There should be more priority seats” (51.6%) (Table 2).

The average OKS was 24.1 ± 7.5 (83 valid responses). A chi-square test was conducted after dividing the participants into 2 groups: one with OKS lower than 23 (43 patients: mean age 77.1 years old) and the other with scores of 24 and over (40 patients: mean age 77.5 years old). The result showed that the group with poor OKS (24 and over) experienced more difficulties than their counterparts, such as “Cannot quickly avoid the crowd getting off at stations” (p = .0009), “I might fall from the station’s staircase” (p = .0364), “The seats are high and difficult to sit on” (p = .0099), and “The seats are low and difficult to sit on” (p = .0374).

Table 1. Demographics of study population

		Number (%)	Mean	S.D.
Mele		6 (6.5)		
Female		87 (93.5)		
Age			77.5	5.6
Conservative therapy		22(23.7)		
Operation therapy	Total knee arthroplasty	53(57.3)		
	Others (Femoral head replacement, Meniscectomy)	18(19.4)		
Oxford Knee Score			24.1	7.5

Table2. Questionnaire for older lower limb osteoarthritis patients using public transportation

(n=93)

		n	%
Style when going out	I chose shoes comfortable to walk in.	87	93.5
	I chose clothes that were easy to move in.	78	83.9
	I chose bags that allowed my hands to be free.	68	73.1
Difficulty	Taking big steps is difficult when getting on trains and buses.	71	76.3
	I cannot quickly avoid the crowd getting off at stations.	65	69.9
	Vehicles' severe shaking makes it difficult to maintain balance.	53	57.0
	Lack of handrails after getting off trains and buses makes it difficult.	49	52.7
	The seats are low and difficult to sit on.	29	31.2
	The seats are high and difficult to sit on.	18	19.4
Anxiety	The shaking of the vehicle might make me fall.	62	66.7
	I might fall from the station's stairs.	61	65.6
	I might trip on the step to the bus.	61	65.6
	My slow walking might annoy other passengers.	61	65.6
	My slow walking might prevent me from getting out at the station.	51	54.8
	I might bump against other passengers and fall.	50	53.8
	My cane might hit other passengers in the small space.	47	50.5
Measures	I try to use the escalator whenever I can.	81	87.1
	I try to use the elevator whenever I can.	79	84.9
	I give myself plenty of time to get to the destination because I walk slowly.	77	82.8
	I try to grab the handrail instead of the strap.	72	77.4
	I try to stand near the door to get off immediately.	58	62.4
	I try to stand against the walls of trains and buses.	57	61.3
Requests	There should be more Western-style toilets in stations.	66	71.0
	There should be more escalators and elevators in stations.	64	68.8
	There should be more seats in the waiting areas of stations.	55	59.1
	The young and physically able people should give their seats to those who are not.	52	55.9
	Drivers should make sure everyone is seated before starting the bus.	50	53.8
	There should be more priority seats.	48	51.6

DISCUSSION

Knee osteoarthritis patients took measures to avoid danger when going outside by choosing clothes that are easy to move around in and leaving both hands free.

What the participants found highly difficult were challenges posed by their lowered physical functions such as the muscular strength needed to go up and down steps and their balance, as seen in "Difficulty of taking big steps and maintain balance." Other responses were connected to the movements of other passengers, such as "Cannot quickly avoid the crowd getting off at stations." Lowered physical functions are common in older adult patients. However, knee patients with reduced muscular strength of femoral quadriceps experience more instability, which increases difficulties.

Things that gave participants a high level of anxiety had to do with falling, such as "Anxiety of falling from the shaking of the vehicle and station's stairs."

According to annual statistics of automobile accidents in motor transportation businesses reporting injuries caused from falling inside public buses, there were 393 accidents inside vehicles in 2007[11]. There are also reports of older adults refraining from leaving their homes due to worries concerning falling[12]. Furthermore, falling is reported to trigger decreased confidence and motivation concerning their ability to function[13].

Coping strategies for fear of falling are needed, such as holding onto handrails when using stairs and choosing to ride during non-peak hours so that they can sit down.

The participants were not only concerned about their own safety but also about others, as seen in the responses, "Anxiety about annoying other passengers by my slow walking and my cane." Creating a society in which people warmly watch over older adults so that they do not have to feel hesitant is also necessary.

The measures the patients take, such as "trying to use the elevator and escalator, having plenty of time to get to the destination, grabbing the handrail, and standing against the walls of trains and buses," all reveal the fact that they are coping with their walking abilities and taking preventative measures against falling. However, the measure of "standing against the walls of trains and buses," which is thought to be taken for extra support, may require extra attention to avoid getting in the way of passengers getting on and off the vehicle as walls tend to be near the doors.

As for the public transportation system, requests for improvements in facility

designs were seen with comments such as requests for more Western-style toilets, escalators, elevators, and seats in waiting areas. Concerning older adults and transport, the "Act on Promotion of Smooth Transportation, etc. of Elderly Persons, Disabled Persons, etc. (New Barrier-Free Law)" [14] was established in 2006. This law promotes barrier-free designs of public transportation systems and buildings to secure independent daily life and social life of older adults and people with disabilities. It specifies measures to promote accessibility in regions centered around stations or that have a high concentration of facilities used by older adults and people with disabilities. However, such designs of public transportation system, roads, and facilities where older adults go are considered to be underdeveloped. Since the importance of creating a good environment for older adults is also alleged overseas, this issue can be global for the aging society[15].

The response of older adults hoping to be given seats and receive consideration from bus drivers reflect how they are hoping for society to show concern for them. Transformation into an older adult-friendly society is not just about changing what we can see.

The average OKS was 24.1 ± 7.5. In previous study reports, most OKS were derived pre- or post-operation. Bin Abd Razak et al. reported 35 points before operation and 21 six months after operation[16]. We reported 33.5 points before operation and 22.4 one year after (mean age 68.2) and 36.9 points before operation and 22.3 one year after (mean age 79.2)[17]. Those post-operation values, derived by the participants in similar age groups to those in this study, were close to the values in this research. The reason is thought to be that the majority of patients had recently undergone artificial knee joint replacement.

The group with poor OKS experienced significantly more difficulties than their counterparts, such as "Cannot quickly avoid the crowd getting off at stations," "I might fall from the station's staircase," "The seats are high and difficult to sit on," and "The seats are low and difficult to sit on." The action of "quickly avoiding something" requires sharp physical functions, and the stability needed to use the stairs and muscular strength required to sit depending on the height of the seat also depend on physical functions. The OKS contains questions concerning related movements such as walking ability, ability to climb up and down the stairs, and standing from seated position. These questions are thought to have affected the patients' level of difficulty.

The limitation of this study was our inability to confirm the validity of the "Questionnaire for older limb osteoarthritis patients using public transportation."

Future study should confirm the validity of this questionnaire with additional populations.

CONCLUSIONS

The study revealed that older knee patients experience difficulty with steps and anxiety about falling when using public transportation. It is thought that nursing intervention such as making clinic reservation time match the non-peak hours of the transportation systems are needed for those patients. In addition, it was made clear that patients with poor OKS experience significant difficulties and anxiety. Understanding each patient's physical ability and giving them advice concerning the usage of public transportation are thought to be effective means of intervention.

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