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Exercise Experience of Elderly Medicaid Beneficiaries with Osteoarthritis Based on Self-Determination Theory

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Background: Osteoarthritis is the most common chronic disease among elders, and it crucially requires self-management. This study aimed to qualitatively examine exercise experiences of elderly Medicaid beneficiaries with osteoarthritis receiving exercise intervention based on self-determination theory (SDT).

Methods: Eight elders who received a community-based exercise intervention were interviewed three times. Using the interview transcriptions and field notes, researchers conducted an interpretative phenomenological analysis based on SDT to explore the motivational process of exercise compliance.

Results: Three meaningful profiles (non-compliant, intermitter, and compliant) were identified along with satisfaction with needs (autonomy, competence, and relatedness) that motivate exercise compliance based on SDT. Compliance of exercise is primarily initiated by external regulation and followed by the internalization process of recognizing and accepting the value of the behavior.

Conclusions: The concepts of SDT could be used to explore factors associated with motivation and gradual behavior change among elderly Medicaid beneficiaries with osteoarthritis. Autonomy, competence, relatedness, external regulation, and identified regulation control may be applied to establish a strategy that promotes behavior change by satisfying the psychological needs and internalizing the behavior of these elders.

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INTRODUCTION

The Medical Aid (Medicaid) system is the main social security system for low-income citizens. Through this, the government provides financial guarantee to people who cannot afford medical expenses. In Korea, the proportion of elderly aged above than 65 years receiving Medicaid assistance was 36%; in the analysis of their demographic characteristics, most of them lived alone, had low educational backgrounds, low socioeconomic status, and poor health conditions, indicating a high need for medical aid. Expenditures

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by the elderly aged above 65 years who received Medicaid assistance in 2019 had increased by 7.4% compared to 2018, and beneficiaries over 65 years spent 62.8% of all Medicaid expenditure in 2019.¹⁾ Specifically osteoarthritis is the fourth chronic disease that frequently impacts the elderly beneficiaries, and the government's expenditure is highest for osteoarthritis management after dementia and hypertension.¹⁾ Despite the significant provision of medical assistance services, this phenomenon is a direct burden on the national finances, causing a further increase in medical expenses. Therefore, considering the rate of aging in Korea, the proportion of the elderly population receiving medical benefits is expected to increase rapidly, and effective interventions for early management of chronic diseases in the elderly are necessary.

Among the chronic degenerative diseases of the elderly, osteoarthritis was known as one of the most common and is known to negatively affect the quality of life. It is an inevitable degenerative disease wherein the joint has to be replaced by a prosthesis.²⁾ There is no real curative treatment for this condition; nonetheless, current treatments are being developed by pharmacological and multidisciplinary approaches. Treatment is mostly required by those with a sedentary lifestyle, and lifestyle changes should focus on tackling weight gain. Regular physical activity in patients with arthritis is reportedly effective in reducing pain and improving function.³⁾ Hence, osteoarthritis is widely known as a disease that requires self-management.⁴⁾ Although self-care for general physical activity and exercise plays an important role, not many patients continue exercise.⁵⁾ Among the exercise and physical activities, walking not only motivates the adaptation of an active lifestyle but it is also an easily acceptable and effective symptom relief in the community base.⁶⁾ However, encouragement to continue walking as a form of exercise and maintaining it as behavior among the elderly who have chronic diseases, such as osteoarthritis, is challenging.

In the field of community health, interventions based on psychological factors that can manipulate behavior for self-management of disease are mostly important. This view can be explained by many theories, such as self-determination theory (SDT).⁷⁾ Autonomous motivation is associated with positive behavioral outcomes, such as continuity of exercise^{8,9)} or psychological well-being.¹⁰⁾ Thus, SDT focusing on the intrinsic motivation for health behavior change has been extensively researched; examples include those for

self-management on diabetes,¹¹⁾ physical activity,⁸⁾ and weight control.¹¹⁾ Specifically, Rodgers et al.,⁷⁾ through a longitudinal study, confirmed that the self-regulation pattern gradually changed in a manner consistent with SDT; specifically, the identified and intrinsic motivation increased within eight weeks. In an SDT-based qualitative study by Kinnafick et al.⁸⁾ satisfaction of the needs for competence and relatedness is essential in the adaptation stage of exercise, and the need for autonomy partially promotes behavioral persistence.

Many SDT-based studies related to health behavior in Koreans are quantitative. Examples include those focusing on exercise compliance,¹²⁾ health behavior,¹³⁾ and kidney transplant patients' self-management behavior¹⁴⁾ which are descriptive and experimental studies. Specifically, as a study on the elderly in Korea, the possibility of applying SDT was confirmed in a quantitative study that revealed that motivational factors for leisure activity among the elderly influenced leisure satisfaction.¹⁵⁾ However, qualitative research on identification of the unique motivational process for self-health management and its relation to personal and social aspects is still unreported. Specifically, studies on the elderly with chronic diseases who could not solve medical problems and receive Medicaid benefits from the government are difficult to find.

Therefore, the purpose of this study was to explore the motivation process of exercise compliance based on the SDT for the elderly who received osteoarthritis Medicaid benefits and participated in the exercise intervention program provided by the community using the interpretive phenomenological analysis (IPA) method, which is a qualitative research methodology. The specific objectives of this study were as follows. First, the general characteristics and profile based on SDT of the study participants were analyzed. Second, themes and sub-themes about the exercise experience of elderly Medicaid beneficiaries with osteoarthritis were analyzed based on SDT.

1. Theoretical background

The basic assumption of the SDT is that humans tend to grow and develop themselves. It also emphasizes that to trigger human voluntary motivation, three basic needs, namely, autonomy, competence, and relatedness should be fulfilled. Satisfaction of these needs leads to self-determi-

nation to execute and maintain a particular behavior.¹⁶⁾ An individual's behavior represents an asynchronous state or either extrinsic or intrinsic motivation, depending on the degree of self-determination.

According to Deci and Ryan¹⁶⁾ in an asynchronous state, there is a lack of intention to act because of the absence of intrinsic or external motivation. A person who is in an asynchronous state typically does not attain the desired behavior outcome suggested by the service provider, or believe that they cannot successfully perform such behavior. Second, extrinsic motivation includes controlled regulation (external and introjected regulation) and autonomous regulation (identified and integrated regulation). External regulation occurs when an individual behavior is motivated by external compensation, pressure, or constraints, implying that it is caused by others rather than self-determination. Individuals with a high level of introjected regulation are driven by internal pressures such as guilt or anxiety. Meanwhile, individuals motivated by identified regulation value and seek the outcome rather than the behavior because they are aware of its merits or values. Integrated regulation is the most self-determining type of regulation that acts as an external motivation; it is based on the belief that high levels of integrated regulation is part of the identity. Finally, self-regulated behaviors based on intrinsic motivation appear when you feel pleasure or interest in the behavior. Intrinsic motivations mean that individuals tend to be interested and are able to pursue and achieve optimal challenges.

As a basic psychological need of SDT, autonomy is a general need involving emotion and free will, which is the belief that individuals are the subjects of their own behavior. Therefore, autonomy is experienced when behaviors are demonstrated intentionally through intrinsic regulation rather than external rewards or pressures.^{17,18)} Meanwhile, the need for competence is the desire to feel that one can perform successfully and can be satisfied with the opportunities to use their abilities, skills, and talents while interacting with the social environment. This need can be seen as a perception of confidence and efficacy rather than the practical acquisition of skills and abilities. To internalize motivation, an individual need to have the confidence and ability to change, which can be achieved when appropriate interventions are provided to overcome any obstacles to behavior change. Finally, the need for relatedness attracts meaningful people in the context that they are in and make them feel like they

are related. This psychological need plays an important role in promoting the internalization of external causes. In other words, it is similar to the concept of social support, suggesting that motivation for a behavior can be more easily internalized from someone other than oneself. The SDT states that fulfilling these needs leads to motivation for self-determination, adapts to diverse areas of life, and yields positive health outcomes.¹⁶⁾

METHODS

1. Study design

This study is based on SDT to explore the motivation process of exercise behavior compliance in elderly beneficiaries of Medicaid, with osteoarthritis who participated in a community-based exercise intervention program through a longitudinal qualitative study method based on interpretative phenomenological approach (IPA). The reason why authors chose this approach is to provide detailed assessments of elders lived experience, who received osteoarthritis Medicaid benefits and participated in the exercise intervention program. IPA is based on an inductive approach that presupposes a human being as a physical, emotional, cognitive, or linguistic being and seeks personal and social experiences of the object without attempting to make an objective statement regarding the object or event.¹⁹⁾ The key elements of the IPA include phenomenology, hermeneutics, and idiographic profile description. Phenomenology aims to understand the nature of the participant's experience, hermeneutics refers to the double interpretation of the researcher's meaning of the participant's experience, and the idiographic profile description explores the entire profile through the characteristics of individual cases. On the basis of these three aspects, the researchers understood and interpreted the nature of the experiences of the individuals stated during the interview, and explored the outline of the entire study.

2. Study participants

As suggested by the IPA methodology,¹⁹⁾ the study participants were selected through purposive sampling among the elderly beneficiaries of the Medicaid. The criteria for selection of study subjects were those receiving Medicaid ben-

efits, aged 65 years or above, diagnosed with osteoarthritis by physicians, attending the community-based exercise intervention program, with no communication restrictions, with no cognitive impairment such as dementia, and who gave consent to participate in this study. Eight elderly people who met the criteria were selected as participants and they voluntarily participated from the beginning to the end of the study without any dropouts.

3. Attended community-based exercise intervention program

The study participants underwent eight exercise intervention sessions (stretching, joint exercises, and walking exercises) by Medicaid case manager (intervention provider) from January to March in 2014. To change the cognition, emotions, and behaviors to continue the exercises, participants were provided with self-management guidelines, exercise booklets, and equipment to motivate or strengthen their exercise behaviors. Exercises consisted of stretching for the arms, back, and legs and knee strength exercises provided by the Korean Knee Society. Moreover, unless outdoor activities become inconvenient, daily walking around the house for 30 minutes to one hour is recommended. This exercise behavior was self-monitored by the participants, and the Medicaid case manager was monitored by personal visits or via telephone. For providing an equivalent intervention program, 16 hours of pre-education and training were conducted for the Medicaid case manager. During the intervention, the director of research led their service quality management.

4. Data collection

Data were collected as suggested by IPA.¹⁹⁾ Interviews of study participants were conducted by the research director. The study purpose and method and the date and time of the interview were explained by the research director. Before the interview, the participants signed the consent form which included agreement to their ethical protection and recording of the interview contents. All the contents of the interview were recorded on two tape recorders. The collected data were manuscripts and field notes of the recordings.

Each interview was conducted three times (immediately after the exercise intervention program, six months after the

intervention, and 12 months after intervention), to confirm the behavior changes of short-term and long-term experience of exercise continuity in osteoarthritis elderly beneficiaries of Medicaid according to SDT. The meeting was at the participant's home and according to their desired time. Each interview lasted for 60 to 90 minutes. Participants were encouraged to talk freely without restrictions, ensuring them that they were not burdened or physically tired during the interview. After the interview, the research director and participants discussed opinions on the interview process and wrote a brief description of the general characteristics. And the research assistant recorded participant's attitudes during the interview.

The main questions during the semi-structured interview were about the exercise-related experience, and they were constructed according to the concept of SDT. The questions were as follows:

- How do you feel when you exercise?
- What motivated you to do exercise?
- Did you face any difficulties during exercise? If so, what were they and how did you overcome them?
- What has helped you to exercise?

5. Data analysis

The research assistant transcribed the conversation and two researchers confirmed the content. Data were analyzed as suggested by IPA.¹⁹⁾ Researchers with IPA experience read the transcription and field notes repeatedly, focusing on the changes in the participant's experience. SDT¹⁸⁾ was employed as an analytical framework in which an individual's social environment could help explain the basic psychological needs, the dynamic process of self-determined motivation, and the adaptation and maladaptation results. First, meaningful words, sentences, and paragraphs were selected, and similar words, sentences, and paragraphs were categorized into subthemes. Then, the researchers presented similar experiences as SDT-based themes (autonomy, competence, relatedness, and component of extrinsic motivation) for the participants' motivation process. After exploring the changes in each participant, the researchers searched the common outline to describe the profile of the participant's exercise motivation process. Throughout this process, the transcription and field notes were continuously compared or contrasted and analyzed to improve the accuracy of the interpretation.

6. Ethical considerations

The research ethics committee of the authors' institution approved this study (YWNR-12-0-003). Researchers explained the study purpose and method (interview, place, time, etc.), the advantages of participating, and the disadvantages of time wastage to the participants. They also clarified that participation was voluntary and would have no effect on the Medicaid benefit services. Furthermore, they explained the reason for recording the interview and that the recordings will be destroyed after completion of the study. Interviews were not used for any purpose other than the study, and the study results elucidated that all participants were treated anonymously. After the research director explained everything, she gave the participants time to ask questions and received written informed consent.

7. Trustworthiness of the study

Researchers who conducted this study are trained in qualitative research methodology and have acquired research experience and continuous knowledge on qualitative research methodology. Researchers tried to prevent preconception and maintain neutrality and immersion in phenomena. Basing on the principles of IPA, the researchers analyzed and provided interpretation and insight. According to the qualitative research evaluation criteria, credibility, transferability, dependability, and conformability were observed.^{20,21)} To confirm the factual value of the research results, researchers summarized and explained the interview contents immediately after the interview and confirmed whether the contents were the same as what the participants said. The analysis results were reviewed by two nursing professors unrelated to this study (credibility). The study method has been described in detail, so that it can be applied in other situations

(transferability), audit trail of recorded data and field notes were analyzed repeatedly (dependability), and researchers tried to avoid the judgment and to exclude subjectivity to maintain neutrality (confirmability).

RESULTS

1. General characteristics of the study participants

Table 1 shows the general characteristics of the study participants corresponding to each profile. The mean age of the study participants was 73.3 years. And, regarding the education level, there were four uneducated individuals, two elementary-school graduates, one middle-school graduate, and one high-school graduate. Two participants were Christians, whereas the remaining six did not practice any religion. Three participants were living with their families. The average duration of living with osteoarthritis was 172.5 months (range, 60-480).

2. Profiles of study participants based on SDT

Based on the longitudinal interviews on exercise compliance experiences of eight elderly Medicaid beneficiaries with osteoarthritis who participated in the exercise intervention program, three meaningful profiles were identified in the coding of psychological needs and internalization as themes based on SDT. Profile 1 (non-compliant) included one person (participant H) who was consistently negative regarding exercise intervention; this indicated failure to exercise because of the lack of psychological needs and internalization. Profile 2 (intermitter) included four people (participants B, C, F, and G), and the internalization of motivation to exercise was gradually unregulated in external regulation, with satisfaction of psychological needs (relatedness)

Table 1. Characteristics of each profile (n=8)

Category	Participant	Age, y	Education	Living with family	Religion	Average duration of osteoarthritis, m
Profile 1 (non-compliant)	H	77	Elementary school graduated	Yes	None	180
Profile 2 (intermitter)	B	79	Middle school graduated	No	Christian	480
	C	75	Uneducated	No	None	120
	F	73	Elementary school graduated	Yes	Christian	120
	G	60	High school graduated	Yes	None	60
Profile 3 (compliant)	A	72	Uneducated	No	None	60
	D	70	Uneducated	No	None	120
	E	80	Uneducated	No	None	240

for exercise intervention. Profile 3 (compliant) included three people (participants A, D, and E) whose psychological needs (autonomy, competence, and relatedness) for exercise were met; thus, the internalization of the motivation to exercise was gradually changed from external regulation to identified regulation.

1) Profile 1: non-compliant

The identified participant in profile 1 was non-compliant and did not exhibit exercise behavior. The defined theme was “unsatisfied psychological needs (autonomy and competence) for exercise after the intervention program, and the motivation for exercise was not internalized.” This theme showed that among the three basic psychological needs, the needs for autonomy and competence were not satisfied. Consequently, the internalization of motivation for exercise was not achieved, reflecting non-compliance.

The non-compliant described in profile 1 immediately recognized the support of the Medicaid case manager in the interview after the intervention (1st interview) (satisfied with relatedness need) but was hesitant to exercise because of pain (unsatisfied with autonomy need) and pessimism about their ability to exercise (unsatisfied with competence needs). This condition lasted for six months (2nd interview) and 12 months (3rd interview) after the intervention. Hence, insufficient psychological needs led to an unregulated state with no self-determination. Considering the lack of the motivation to exercise, intrinsic motivation failed. Example dialogs of profile 1 were as follows. The dialog in parentheses was attached by researchers to assist the reader in understanding.

“I’m thankful that the (Medicaid case) manager keeps coming. But I’m sorry, my back hurts... I can’t do exercise because I’m tired.” (1st interview; H)

“Exercise? I don’t do anything... Hey, I can’t get stuck with the cold ... in the room ... I can’t, I can’t.” (2nd interview; H)

“Fitness equipment? It’s hanging over there... Well ... I can’t exercise ... I can’t help it... Well, if I go outside, I just take a bus or a taxi.” (3rd interview; H)

2) Profile 2: intermitter

Four participants identified in profile 2 were intermitters, who exercised intermittently and eventually stopped. The defined theme was “the internalization of the motivation for

exercise was achieved by the fulfillment of psychological needs (relatedness) immediately after program intervention, but it became unregulated over time.” These intermitters recognized the support of the Medicaid case manager immediately after the intervention (1st interview) (satisfied with relatedness needs), and they intermittently exercised up to six months after the intervention (2nd interview) by the Medicaid case manager. Then, 12 months after the intervention (3rd interview), they did not want to exercise (unsatisfied with autonomous needs) or did not feel the need to exercise (unsatisfied with competence needs). Hence, the intrinsic motivation for exercise failed, considering that an unregulated state lacks the motivation to exercise.

“Exercise! ... (Medicaid case) manager told me to walk, but I can’t do that a lot because I’m tired” (1st interview; B, G)

“Well ... I didn’t exercise that much. But (Medicaid case) manager keeps coming and telling me... so, I’m walking around the house with a stroller.” (1st interview; C, F)

“I can’t do it every day. If I just don’t feel good, I lie down... And if (Medicaid case) manager keep telling me to wake up, then, I try again... 30 minutes of exercise and 30 minutes ... Mostly in the afternoon. I walk around the middle school grounds as I do not want to go far.” (2nd interview; B)

“I do my best. I go back and forth ... I try to go to more places ... I’m worried about dementia if I don’t get out of home. So I try to walk for a few rounds... I can’t break myself anymore... I don’t want to lie down because it’s bothersome. If I can’t go outside, my children will be worried. So I try to go out ...” (2nd interview; C)

“I can’t exercise. I walk with a stroller... I sometimes go to the market in the afternoon.” (2nd interview; F)

“I exercise, but I can’t do it steadily. Well... I am not that good at it...” (2nd interview; G)

“I can’t (exercise) because my knees are thick... I don’t like walking when it takes a lot of time... I can’t climb the stairs ... I hate them s the most ...” (3rd interview; B)

“Do I do it myself? ... No!... It’s hard to exercise... It’s better not to ... I forgot everything the (Medicaid case) manager taught me, I can’t remember... I can’t even clean my house...” (3rd interview; C, F)

“Well, exercise... I wish I could stretch... But... I can't. My heart is a burden ...” (3rd interview; G)

3) Profile 3: compliant

Three participants identified in profile 3 were compliant, implying that they continuously exercised. The defined theme was “after the exercise program intervention, the psychological needs (autonomy, competence, and relatedness) for exercise are met and gradually internalized.” This theme reflected that the participants adapted and continued to exercise because their basic psychological needs (competence, autonomy, and relatedness) were met. Immediately after the intervention, they did not recognize the need for exercise for disease management and were passively aided by Medicaid case manager. However, 6 and 12 months after the intervention, they stated that they had accepted the effects of exercise and eventually exercised on their own. The derived themes included two themes as follows: “satisfaction of psychological needs for exercise” and “internalization of exercise.” The theme of “satisfaction of psychological needs for exercise” includes the subthemes of “autonomy,” “competence,” and “relatedness,” whereas that of “internalization of exercise” includes the subthemes of “external regulation” and “identified regulation.”

3. Derived themes and subthemes of exercise experience of study participants based on SDT

1) Theme 1: satisfaction of psychological needs for exercise

(1) Subtheme 1: autonomy

In the first interview immediately after eight interventions provided by the Medicaid case manager, participants stated that they passively exercised due to intervention by Medicaid case manager. They further mentioned that they had the opportunity to exercise by utilizing external resources and felt the positive effect of exercise.

“I've been doing a lot of things, told me to do (by Medicaid case manager) (actually demonstrating stretching movements), I think it helped.” (1st interview; A)

“(Medicaid case) manager keep saying to me to do exercise... I walk little by little.” (1st interview; D, E)

“I walked and walk.. now... I walk habitually...” (2nd in-

terview; A)

“When the knee hurts, I lie down and roll a towel under my knees... To give strength and to stretch (stretch) ... I can do it as long as I lie down...” (2nd interview; D)

“I walk near the house... It takes about 20 minutes. It's cool if I put a towel under my legs and do a stretching exercise while watching television.” (2nd interview; E)

“It was good to exercise and move... that's what I do for my body ...” (3rd interview; A)

“Well ... I knew exercise was good, so I'm still doing it little by little now.” (3rd interview; D)

“I need to be healthy as long as I live. So I try to force myself to walk, deliberately go far away and keep exercising. I've been exercising on my bed (testing stretching). I don't forget this...” (3rd interview; E)

(2) Subtheme 2: competence

In the first interview immediately after eight interventions provided by the Medicaid case manager, the participants felt that they could not do it because of joint pain. However, in the second (6 months after intervention) and third interviews (12 months after intervention), they stated that they could finally do it themselves.

“(Knee) It's not good, but I'm afraid to exercise...because I may hurt again... So as like (Medicaid case) manager told me... I do exercise and rest a bit and then exercise and rest a little ... I feel uncomfortable with my joints but I get worse if I sit down. So I do as much as I can...” (1st interview; A)

“It's hard ... but I still exercise ...” (1st interview; D, E)

“I know myself. I don't like walking every day. So walk every 2-3 days. When it snows a lot in winter, I just do exercises at home. If your knee hurts a lot, you get a soak and a hot pack.” (2nd interview; A)

“It's cold outside to do stretching. So, I did stretching in the room. When I have a bad back or when I didn't want to work, I lie down and look at the picture (exercise guide hand book) given (by the Medicaid case manager). (2nd interview; D)

“I got better after exercising. I used to have diabetes, so people said I die. But it was almost better with exercise.

Aerobics comes from the health insurance company and I do it twice a week. I've been doing this a lot since then. I do everything I can do exercise. Look... I can do like this (stretching demonstration). No other people do. (3rd interview; A)

"Yes, I knew exercise was good. Even I can't do much, but I'm doing it little by little. Keep doing it little by little. Last time it was hard to move my neck back too much. But I can do it now.. See... I think my health has improved. Before, I had to take a taxi to the hospital to see the grocery store. But, I rest in the middle now, but I can still walk. I can do everything I can." (3rd interview; D)

(3) Subtheme 3: relatedness

In the first interview immediately after eight sessions of the exercise program intervention provided by the Medicaid case manager, the participants stated that they joined in the exercise, starting with building a rapport with the Medicaid case manager. However, in the second (6 months after intervention) and third (12 months after intervention) interviews, they stated that they were exercising with people other than the Medicaid case manager. They also mentioned that they were grateful and happy to see that the Medicaid case manager visited and would continue the exercise. However, 6 to 12 months after the intervention, they stated that they continued the exercise, seeking pleasure in their relationships with their family or neighbors.

"Thank you for (Medicaid case) manager visit... But I think I'm being taken care of by the managers. So, I feel that I'm sorry. So if the manager tells me to exercise, then I do." (1st interview; A)

"I know thank to (Medicaid case) manager. For my body, (Medicaid case) manager tells me and tells me, so ... it helps. I think I should exercise a little bit more." (2nd interview; A)

"I changed a lot when I thought about it ... I never talked to anyone before. But I've been meet with managers often ... Now... When I was waiting for the bus, I first talked to the person next to me ... So I think I can do something more, and I'm going to exercise more..." (2nd interview; D)

"It's nice to see manager laughing and seeing manager. I don't know how good it is. ... all my neighbors were empty. So it was very bad ... I didn't have anyone to talk... Nice

to have a visitor... So... The manager came and informed me that I didn't know ... I can do exercise more..." (2nd interview; E)

"When my son-in-law and daughter come, we go out for lunch together and go to the dentist ... So that time, I can walk more..." (3rd interview; A)

"My neighbor repaired the roof. So I walked around the house and walked again and again to check it... And nowadays I also walk to older center." (3rd interview; D)

"My neighbors are bringing me together. It's nice to walk together and comfortable." (3rd interview; E)

2) Theme 2: internalization of exercise

Satisfaction of the psychological needs (autonomy, competence, and relatedness) of the participants played an important role in internalizing their exercise. Participants' behavioral control appeared as an external regulation by the intervention provider immediately after the intervention, and after 6 and 12 months, they realized the benefits of the exercise and then revealed the identified regulation for exercise compliance.

(1) Subtheme 1: external regulation

External regulation means that the reason for the behavior is entirely to satisfy external needs or socially provided relevance. Initially, the participants exercised at the request of a mediator (Medicaid case manager).

"(Medicaid case) manager told me to do exercise... So, I just did ..." (1st interview; A)

"Exercise? I didn't do it before ... but the manager told me to do." (1st interview; D, E)

(2) Subtheme 2: identified regulation

Identified regulation is a state of recognition and acceptance of the value of behavior and part of one's identity. The participants understood and realized the benefits of the exercise and then complied with it.

"I exercised aerobics, it was good to me ... I went to the place where young people are doing exercise. Just I imitate from behind ..." (2nd interview; A)

"The exercise ... Last time, manager taught me the exercise using the strip (stretching tool). So it was good to do

follow. I didn't know that before ...” (2nd interview; D)

“After exercising, my leg hurts sometime, but I feel good. I feel sick if I stay still...” (2nd interview; E)

“I got better after exercising. I came doing it today. It was a group exercise ...” (3rd interview; A)

“I can't feel that my waist is getting better or not... but I feel less pain when I exercise. I think I've softened my neck cause the exercise.” (3rd interview; D)

“I need to be healthy as long as I live. That's why I have to walk around and go around and keep exercising.” (3rd interview; E)

DISCUSSION

Regular physical activity and exercise are of utmost importance in preventing worsening of symptoms of osteoarthritis in the elderly. In particular, continuous self-management of elderly Medicaid beneficiaries with osteoarthritis can have a positive effect on improving their quality of life as well as reducing government expenditure on medical expenses. Therefore, exploring the motivation process of exercise compliance of elderly Medicaid beneficiaries with osteoarthritis could provide the useful strategies in developing exercise intervention programs for the elderly. Qualitative exploration of the exercise experience of elderly Medicaid beneficiaries with osteoarthritis helps in understanding the process of exercise or the motivation related to the adaptation by those with physical and socioeconomic constraints. It can also be used as an intervention strategy to increase the satisfaction of the study participants in intervention studies aimed at changing the behavior. The three profiles derived in this study differ in psychological needs and internalization related to the sustained behavior of the elderly Medicaid beneficiaries with osteoarthritis. Satisfaction of the individual's desire for exercise behavior is essential to fulfill or sustain the behavior.

These findings are consistent with the results of an experimental intervention study that enabled the internalization of motivation in adults who were obese and less physically active through exercise interventions,^{22,23)} or the findings in which increased satisfaction of needs had a positive effect on attitude and intention to exercise.²⁴⁾ Specifically, according to Kinnafick et al.²⁴⁾ fulfillment of the competence or relatedness needs is more important in the early stages

of adaptation, but the autonomous need is more important for behavioral persistence. Other researchers also described that fulfilling relatedness as an important factor in the early stages of behavior change.²⁵⁾ Most importantly, relatedness is associated with social situations where participants received attention from those who care about them and felt a sense of belongingness. The desire for relatedness is linked to intrinsic motivation and affects the perception of autonomy and competence. Furthermore, the inherent social situations affect the intrinsic motivation.²⁶⁾ In our study, the participants in profiles 1, 2, and 3 had a common relatedness need in the early stages, resulting in the motivation to exercise. Hence, the support for exercise provided by the mediator (Medicaid case manager) satisfied the relatedness need. However, despite the need, participants in profile 1 did not achieve the goal of complying with the exercise. Participants in profile 2 ceased to exercise because they became uncontrolled over time, even though they had internalized their motivation to exercise. These results are in the same context as those in the study of Teixeira et al.²⁵⁾ According to them, more relations are linked to self-determined motivations and health behaviors, but additional factors that influence the behavioral interruption of subjects other than relatedness need further verification.

Moreover, the need for competence is not an acquired skill or competence itself but a perception that individuals want to feel competent. It is fulfilled when they experience opportunities to use their abilities, skills, and talents during social interaction. Support for competence promotes the internalization of motivation and self-regulation of an externally motivated behavior.²⁶⁾ Hence, internalizing the regulation of behavior is impossible, unless one feels confident in performing the target behavior. However, the need for competence leads to autonomy, thereby believing that the source of behavior is self and that they are the subject and adjuster of their behavior.¹⁷⁾ Given that behavior stems from interests and integrated values, the need for autonomy is essential for internalization.¹⁷⁾ A research study by Teixeira et al.²⁵⁾ found that awareness of autonomous support promotes regulation of one's self-determining behavior. In the study by Kinnafick et al.²⁴⁾ the need for autonomy appeared later in the course of behavior change, and those without autonomy stopped physical activity. These previous studies support the experiences of profiles 2 and 3 in the current study. For example, participants in profile 2 were satisfied with

their need for relatedness and competence for exercise but eventually stopped exercising. Meanwhile, participants in profile 3 continued to exercise over time because their motivation was internalized by satisfying their need for autonomy along with relatedness and competence. Considering that autonomy is strongly linked to self-determined motivation, previous studies focused on autonomy support from coaches, colleagues, and healthcare providers,²⁷⁾ The results of this study also show that recognizing autonomy in the early stages influences the internal motivation to sustain the exercise behavior, thereby supporting the SDT. This finding can be shown in the participants in profile 3 wherein exercise support (external regulation) by mediators (Medicaid case manager) immediately after the intervention helps in understanding and realizing the benefits of exercise at 6 and 12 months after the intervention. Consequently, participants performed the exercise (identified regulation). The change of autonomy indicated a change of autonomous motivation for exercise along with competence and relatedness, further confirming that autonomous control is an important factor in exercise.⁷⁾

Internalization is the process of transforming external motivations into intrinsic motivations, which is part of the active process of transforming social demands into internal values or self-regulation.²⁶⁾ When the intrinsic motivation process works optimally, people recognize social rules as important, assimilate them into their integrated self, and accept them as their own. However, if the process is hindered, regulations and values remain external or partially internalized. The result is an identification that is not implied or integrated, leading to an insufficient self-determined behavior. Thus, the degree of behavior control depends on the degree of internalization.²⁸⁾ Our study also produced results similar to those of previous studies. Through the analyzed profile, the satisfaction of psychological needs (autonomy, competence, and relatedness) for the individual exercise behavior plays an important role in internalizing exercise. Motivation internalization is, therefore, important for behavior compliance.

With regard to the strength of this study, the experiences of the participants in the exercise intervention program were longitudinally explored through three interviews for 12 months. We conducted qualitative longitudinal studies to investigate behavior changes related to exercise compliance in elderly Medicaid beneficiaries with osteoarthritis due to confirm the behavior changes of short-term and long-term experience of

exercise continuity. Only few studies have explored the experience of participants' behavior changes for 12 months.²⁴⁾ The results of this study, which explored experiences immediately after the intervention, 6 months after the intervention, and 12 months after the intervention, focused on the process of compliance and change in behavior.

However, there were some limitations of this study. Above all, samples were limited to explore variety experience of elderly Medicaid beneficiaries. Considering that the participants were elderly Medicaid beneficiaries with osteoarthritis, recording various experiences for each participant through further studies is necessary to verify the SDT with a sample of participants from various groups participating in the exercise intervention program. Moreover, even if the researchers provided an uncritical and reliable interview environment during the interview, the participants may have responded considering social desirability. Therefore, the study results should be interpreted in consideration of these limitations.

Osteoarthritis is the most common chronic disease among elders who receiving Medicaid assistance, and it requires continuous exercise self-management in their daily life. In this study, authors explored exercise experience and motivation process of exercise compliance for the elderly who received osteoarthritis Medicaid benefits based on SDT using IPA method. As results, three profiles (non-compliant, intermitter, and compliant) were identified along with satisfaction with needs (autonomy, competence, and relatedness) that motivate exercise compliance based on SDT. Compliance of exercise is primarily initiated by external regulation and followed by the internalization process of recognizing and accepting the value of the behavior. SDT was employed to understand the process of behavior change of elderly Medicaid beneficiaries with osteoarthritis who participated in the exercise intervention program. Therefore, the concept of SDT may be applied to establish a strategy that promotes behavior change by satisfying the psychological needs and internalizing the behavior of these elders.

요 약

연구배경: 골관절염은 노인기의 흔한 만성질환으로 자기 관리가 매우 중요한 질환이다. 본 연구는 자기결정성 이론(SDT)을 기반으로 운동중재를 제공받은 골관절염이 있는 의료급여 수급 노인의 운동 자기관리 행위 변화 과정을 확

인하고자 실시되었다.

방법: 지역사회 기반으로 제공된 운동중재에 참여한 의료급여 수급 노인 가운데 골관절염을 진단받은 총 8명을 대상으로, 중재프로그램 종료 직후와 6개월 이후, 12개월 이후 총 3회에 걸쳐 운동 자기관리와 관련된 다양한 행위변화에 대한 경험을 면담을 통해 자료수집하였다. 수집된 자료(면담 필사본, 현장상황 기록지)는 골관절염 의료급여 수급 노인의 운동 자기관리 동기화 과정 탐색을 위해 SDT에 기반하여 해석현상학적 기법으로 분석하였다.

결과: 골관절염 의료급여 수급 노인의 운동 자기관리 형태는 불이행자, 중단자, 이행자의 세 가지 유형으로 구분되었다. 노인의 운동 자기관리는 SDT에 기반한 자율성, 유능성, 관계성의 충족이 행위 이행에 동기를 부여하는 것으로 확인되었다. 행위의 동기화 시작에는 외적 조절이 영향을 미쳤고, 행위의 지속적인 이행에는 확인된 조절이 영향을 미쳤다.

결론: 골관절염 의료수급 노인의 운동 자기관리 행위 이행에 동기 부여와 점진적 행위 변화를 이해하는 데 SDT는 효과적인 이론이며, 노인 대상자의 운동 자기관리 도모를 위한 중재프로그램 개발 시 자율성, 유능성, 관계성, 외적 조절 및 확인된 조절을 향상시키는 데에 노력을 기울여야 할 것이다.

중심 단어: 노인, 운동, 의료급여, 골관절염, 질적연구

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