



Effects of the Health Management Importance Awareness Disabled Participated the Muscle Strengthening Exercise

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Abstract

Purpose: This study also highlighted the importance awareness and provided the foundational data required to develop the effective muscle strengthening exercise program targeting this population.

Methods/Analysis: 10 intellectually disabled participated in muscle strengthening exercise. To assess health management importance awareness, the Canadian Occupational Performance Measure was used to identify and prioritize problems restricting or impacting their occupational performance. They were divided into two groups according to the assessed priority: extreme and neutral importance in order to analyze the changes of occupational performance and basic fitness. SPSS ver. 18.0 was used to analyze for descriptive statistics, followed by Wilcoxon signed-rank and Mann-Whitney U tests.

Findings: The results of the present study demonstrate the efficacy of the muscle strengthening exercise targeting the people with intellectually disabled and importance awareness levels contribute to the change of the occupational performance and basic fitness. Also, according to the finding, we demonstrated that the health management importance awareness may great importance influence on activity participation and performance. Thus, through continuous application of this exercise program with the emphasis on health management importance awareness, this this will help to maintain a healthy lifestyle and contribute to improved quality of life.

Keywords: Basic fitness; Health management importance awareness; Intellectual disability; Occupational performance; Residential care facility

Introduction

Increasing life-spans have fuelled the steady increase in people's inner and extrinsic motive in health. Health increases quality of life, and health has become an essential element of maintaining a healthy life [1]. There has been a paradigm shift in terms of how to maintain a healthy life. While the focus was on treatment and management of disease in the past, preventive management of risk factors is emphasized today. In addition, professional and personalized health management tailored to suit the individuals; unique health status, self-management of health [2], and participation in personalized activities targeting individuals' unique characteristics and interests are also growing in popularity [3].

In keeping with this trend, efforts are increasing to develop and provide health management programs tailored to meet the importance and the interests of individuals with intellectual disabilities in residential care facilities [4]. However, providing comprehensive and professional services according to the preferences, interests, and characteristics of this population group has been challenging [5]. Furthermore, due to the limited number of leisure activities and exercise programs available, many residents of these facilities tend to

spend their ample leisure time in a less than meaningful way, which has led to the issue of perfunctory health management [6]. Limited participation and lack of opportunity often leads to decreased interest and motivation, which subsequently result in the development of a negative attitude in which quitting becomes an easy choice when things become challenging [7]. It is critically important to provide residential care facilities with the comprehensive management and support required for effective application of health management programs. It is also crucial to expand opportunities for participation in health management activities and to reinforce the interest and health management importance awareness among the residents of these facilities.

When it comes to participation in health management programs, health management importance, individual motivation for participation, interest, goals and program details play an important part in determining participation and performance, which subsequently exert a positive influence on individual performance and satisfaction. In addition, awareness increases the programs' efficacy by improving attitudes and increasing active participation in health-promoting activities [5].

Only one previous study on health management among the intellectually disabled examined the relationship between physical fitness and obesity [8], another examined the health indices, self-perception, and interest among intellectually disabled participating in

a game bike exercise program [7]. However, studies of people with intellectually disabled residing in residential care facilities are lacking [9]. Moreover, studies concerning their awareness regarding the health management importance are limited to one study that examined the health effect of knowledge and interest pertaining to health management [10], while those assessing awareness' effect on the people with intellectually disabled participating in these programs are altogether non-existent.

Therefore, the present study determined the effect of the health management importance awareness on the occupational performance and basic fitness level among the people with intellectually disabled residing in residential care facilities. The aim of the study was to highlight the need for this awareness and to provide the foundational data required to develop a strength training program targeting this population.

Subjects and Methods

Subjects

The subjects, consisting of 10 people with intellectually disabled residing in a residential care facility located in Y city in Korea, participated in the study from July 1 to September 30, 2016, a total of 12 weeks. The subject selection criteria included volunteer participation, not on antipsychotic drugs, no hearing or vision impairment, and no neurological or orthopedic impairment interfering with physical movement. To assess whether prospective subjects' cognitive ability was at an appropriate level for participation in the study, the Korean version of the Mini Mental Status Examination (MMSE-K) was administered. Those who were assessed to have mild cognitive impairment (a score of 20 points or higher) in terms of attention, language comprehension, physical performance, and direction-taking were enrolled in the study.

According to the principles of the Declaration of Helsinki, the study's purpose and method were fully explained to the potential subjects. Through this procedure, the subjects only were recruited to consent to participate in this study. Also, because of the limited communication and social interaction skills of those with intellectual disabilities, the consent to the participation of this study was received from their care givers [11].

Muscle strengthening exercise

The strength training program consisted of two sessions per week, following the World Health Organization (WHO)'s recommended physical activity guidelines for individuals aged 18-64 years. Each session lasted 10 min or more, for a minimum of 150 min per week [12]. Each exercise session consisted of a warm-up, cool-down, and a 10-min whole body workout portion designed to train each specific part of the body with a resistance band, which is widely used for rehabilitation as it is low-impact [13]. Following the strength exercise guidelines from the Korea Occupational Safety and Health Agency [14], the eight body parts (chest, shoulders, back, biceps, triceps, abs and lower body) were trained with the use of a resistance band over three sets of 12 repetitions (Table 1). Each session was conducted with the help of a life rehabilitation instructor.

Canadian occupational performance measure

To assess the perceived health management importance, we divided groups according to the perceived importance. We analyzed the participants' perceptions regarding the importance of occupational performance problems based on the priorities of the divided groups using the COPM assessment prior to the program. The results indicated that in the group where weight loss, insufficient strength, lower-back pain, and diabetes management were ranked highest, the mean importance was 9.2 points, whereas, in the group where those measures were ranked 2nd and 3rd, the mean importance was 6.2 points. As such, the present study applied the 10-point scale classification standard used in Cho's study [10] to create an experimental (Extreme) and control group (Neutral) (N=5 each) out of the groups with mean importance of 9.2 and 6.2 points, respectively.

Changes in occupational performance in relation to perceived importance within and between groups were analyzed with the COPM assessment by assessing the participants' performance in and satisfaction with dynamic health management activities in the leisure activity domain before and after participating in the program.

Basic fitness

Future, changes in basic physical fitness in relation to perceived importance within and between groups were analyzed by measuring muscle strength and flexibility-two components of basic physical fitness-with sit-ups and sit-and-reach, respectively, as per the 2014 guideline for measuring and assessing physical fitness in the community-wide health promotion project manual published by the Ministry of Health and Welfare [15]. The measurement was performed after providing the participants with adequate explanation and visual cue.

For sit-ups, the subjects were instructed to lay down on the mat in a supine position with knees bent, to sit up until their elbows touched the knees, and then return to the starting position. A single one-minute assessment was performed, and the number of completed sit-ups was recorded. For the sit-and-reach flexibility test, the subjects were instructed to place their socked feet squarely on the vertical plate of the measurement tool. Upon gently pressing the knees, the subjects bent their upper bodies forward and maintained the position for a minimum of two seconds. The measurement was taken where their fingertips touched while holding this position.

Data analysis

Each subject was assessed twice and the better measurement was recorded [16]. The collected data were encoded and analyzed using SPSS ver.18.0. The subjects' general characteristics were presented using descriptive statistics. For in-group and between-group analysis, Wilcoxon signed-rank and Mann-Whitney U-tests were used, respectively. The level of statistical significant was set to 95%.

Results

Participants were 10 intellectually disabled residing in a residential care facility in Y city in Korea. The general characteristics of the subjects indicated that the extreme important group (N=5) consisted of three men and two women with a mean age of 22.2 years. In terms of disability level, four subjects were level 2, and one subject was level 3. The mean importance about health management was 9.2 points. The neutral importance group (N=5) consisted of three men and two

women with a mean age of 24 years. As for the disability level, three were level 2 and two were level 3. The mean importance about health management was 6.2 points (Table 1).

Importance group (n = 10)	Age (years)	Sex (n)		Disability Rating		Importance (points)
		Male	Female	Grade	n	
Extreme (n=5)	22.2 ± 4.4	3	2	2	4	9.2 ± 0.8
				3	1	
Neutral (n=5)	24.0 ± 3.2	3	2	2	3	6.2 ± 1.3
				3	2	

Table 1: General characteristics.

In-group analysis showed that the performance and satisfaction level measures increased an average of 4.6 points, respectively, following completion of the program in the extreme important group. In the neutral group, these measures increased an average of 2.0 points, respectively. Statistical verification found that there was a significant increases in both groups at a 95% CI (Table 2).

Importance group	Item (points)	Pre-program (Mean ± SD)	Post-program (Mean ± SD)	Z
Extreme	Performance	3.8 ± 1.5	8.4 ± 0.6	-2.032*
	Satisfaction	4.8 ± 1.1	9.4 ± 0.6	-2.060*
Neutral	Performance	3.6 ± 2.1	5.6 ± 1.7	-2.060*
	Satisfaction	4.6 ± 0.9	6.6 ± 0.9	-2.236*

*p<0.05

Table 2: Occupational Performance Measures (Within Groups).

Item	Test	Importance Group	Mean Rank	U	Z
Performance	Pre	Extreme	5.9	10.5	-0.43
		Neutral	5.1		
	Post	Extreme	7.7	1.5	-2.394*
		Neutral	3.3		
Satisfaction	Pre	Extreme	6	10	-0.548
		Neutral	8		
	Post	Extreme	5	0	-2.685**
		Neutral	3		

**p<0.01, *p<0.05

Table 3: Occupational Performance Measures (Between Groups).

The between-group revealed found a significant difference in the performance measures taken upon completion of the program. A

difference was also observed in satisfaction level measured upon completion of the program, which was significant at a 99% CI (Table 3).

In-group analysis of basic fitness level showed an average increase of 5.2 and an average flexibility increase of 1.46 cm in the extreme important group following completion of the program. In the neutral importance group, an average fitness increase of 4.0 and an average flexibility increase of 1.6 cm were observed following completion of the program. These increases were significant in both groups at a 95% CI (Table 4).

Importance Group	Item	Pre (Mean ± SD)	Post (Mean ± SD)	Z
Extreme	Muscle strength (ea)	30.2 ± 6.4	35.4 ± 7.3	-2.032*
	Flexibility (cm)	1.88 ± 5.5	3.34 ± 6.5	-2.023*
Neutral	Muscle strength (ea)	29.0 ± 7.3	33.0 ± 8.5	-2.041*
	Flexibility (cm)	6.4 ± 15.8	8.0 ± 16.0	-2.070*

*p<0.05

Table 4: Basic Fitness Measures (Within Groups).

Between-group analysis of basic fitness level found no significant differences in strength or flexibility before or after the program (Table 5).

Item	Test	Importance Group	Mean Rank	U	Z
Muscle strength	Pre	Extreme	6.1	9.5	-0.636
		Neutral	4.9		
	Post	Extreme	6	10	-0.522
		Neutral	5		
Flexibility	Pre	Extreme	4.6	8	-0.952
		Neutral	6.4		
	Post	Extreme	4.6	8	-0.952
		Neutral	6.4		

Table 5: Basic Fitness Measures (Between Groups).

Discussion

Typically, participation motivation, interest, and attitude play important roles in performance and satisfaction. Unfortunately, discouraged by the limited environment where opportunities for health management are scarce, the people with intellectually disabled residing in residential care facilities have a low level of interest and motivation, which contributes negatively to the development of a positive attitude towards their participation in health-promoting activities. For this reason, these people often have difficulties in understanding the health management importance and, consequently, have passive attitudes towards taking the steps required for the participation in the health management [7]. In addition, insufficient understanding regarding health issues and a lack of ability for prevention further limit the

acquisition of skills and information required to maintain optimal health [17]. For this reason, the present study examined the intellectually disabled residing in residential care facilities and performed a group analysis of the health management importance awareness. The aim of the study was to highlight the need for this awareness as well as the importance of providing adequate motivation for it. The results showed that statistically significant changes occurred in both groups following completion of the program, in terms of performance and basic fitness level. In addition, statistically significant differences in performance and satisfaction level were observed between groups following completion of the program, indicating that the health management importance awareness had a positive effect on the subjects' participation in the program.

The health management importance awareness encourages more meaningful participation and utilization of strength training programs [18]; moreover, it also helps to increase performance and to improve perception and psychology, which subsequently exerts a positive influence on performance and satisfaction [19]. These findings are supported by a study investigating the leisure time usage and leisure activities performed by facility-based the people with intellectually disabled [18] and a study examining the satisfaction with leisure activities among facility-based people with intellectually disabled [20], where there were improvements in performance and satisfaction after participating in exercise programs. Furthermore, the people with intellectually disabled exhibited improvements in rating of perceived exertion and interests after participating in a game-bike exercise program [7], suggesting that participating in an exercise program effectively contributes to increasing participants' interests and altering their perceptions. Thus, the limited living environments and mundane daily schedules of the people with intellectually disabled residing in residential care facilities should be improved by participation in rehabilitation sports programs, which should be provided in a continuous manner.

Between-group analysis revealed statistically that the extreme important group showed higher levels of performance and satisfaction level relative to those of the neutral importance group. This result is attributed to the awareness and understanding of the importance of health management, which contributed positively to program participation and performance. These results were supported by those of a previous study on the effect of health knowledge and interest on health management [1], in which knowledge and interest regarding health management improved attitude, perception, and interest regarding health management, which led to increased participation in and practice of related activities.

Kim's study [3] also supported our findings, as this study reported that boosting individuals' awareness and perceived importance about health management through health management counseling has positive effects on health management practice, stressing the significance of perceived importance about health management. These reports suggest that it is highly important to expand the understanding of people with intellectually disabled regarding health management and for them to perceive the need for managing one's own health. Thus, continuous health management education and exercise programs should be administered to the people with intellectually disabled to boost their interest in participating in health management activities and help them perceive the importance of health management. Moreover, participation in such activities and programs would positively alter their perception and attitudes about health management [7]. Once they learn how to manage their own health,

they would be able to apply these methods during their leisure time to spend the time meaningfully with activities such as health management activities and sports, which would ultimately help them maintain a healthy lifestyle [18].

Analysis of basic fitness level revealed increased strength and flexibility in both groups following completion of the strength training program, likely due to increased muscle mass and motion stability through the program exercises. The increased muscle contraction and flexion, as well as the improved joint mobility, are attributable to the increased flexibility. In short, participation in the strength training program contributed to an improved basic fitness level in the intellectually disabled subjects included in the present study [20]. Furthermore, the results of this study are supported by those of various studies which reported improved strength and flexibility following strength training in intellectually disabled children [21] and resistance band training in the people with intellectually disabled [22]. Studies have also reported increased strength and flexibility in the experimental group compared to those in the control groups following participation in a sports rehabilitation program [23].

However, no differences in strength and flexibility were observed between groups in the present study. This result may be due to the fact that, unlike subjects in previous sports rehabilitation program studies which involved the people with intellectually disabled registered in welfare agencies or community health care centers, the present study's subjects residing in residential care facilities had a lower basic fitness level due to limited opportunities to participate in such programs, as well as the characteristics of the living environment in these facilities. Few differences were observed between the extreme and neutral importance groups in terms of strength and flexibility, likely due to the short duration of the program. Therefore, increasing opportunities for participation by providing diverse programs and mid to long-term provision of such programs may offer a better glimpse at the differences between groups.

The limitations of the present study include the small sample size among all residents in the residential facility and the fact that participation was limited to those who volunteered and consented. Therefore, it will be beneficial to examine the changes in a larger number of subjects beyond those residing in residential care facilities. In terms of the consistent offering of programs, selecting programs that are responsive to individual characteristics and level of disability, as well as preferences and interest, are needed. Furthermore, methodological improvements in which participants can choose their preferred activities are necessary. Another limitation of this study was that the long-term effects could not be examined because the program was only 12 weeks. A longer-term study analyzing the sustainability and further progress of the effects, as well as their transferability to everyday life, would be beneficial.

Conclusion

The results of the present study demonstrate the efficacy of the muscle strengthening exercise targeting individuals with intellectually disabled and importance awareness levels contribute to the change of the occupational performance and basic fitness and the health management importance awareness may great importance influence on activity participation and performance. Thus, through continuous application of this exercise program with the emphasis on health management importance awareness, this this will help to maintain a healthy lifestyle and contribute to improved quality of life.

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