

The Assessment of the Leisure Benefits for the Elder Recreational Activities

From Reminiscence Approach to Recreational Programming

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Abstract: Recreational activities are beneficial for the elderly. However, little is known regarding specifically which types of recreational activity benefit older adults and in what ways. The purpose of this study was to assess the particular benefits of different types of recreational activities. The intervention experiments in this study focused on three recreational activities, based on the different physical movements required: handicraft activities (finger movement), horticultural activities (upper limb movement), and Petanque (whole body activity), with each session lasting five weeks. Erickson's life development theory was adapted to conduct the three recreational activities and to aid the elderly in reminiscing about their lives throughout the activities. Before and after the program intervention, the subjects were asked to fill out a questionnaire that analysed the leisure benefits of these recreational activities. The results are: (1) Significant improvements in seniors' leisure benefit perception validate the effectiveness of adopting the reminiscence approach to recreational programming for seniors. (2) Different program characteristics affect seniors' perceived leisure benefits in various ways. (3) Programs involving more motor skills are associated with physiological leisure benefits. (4) Psychological leisure benefits are linked to the "newness" of programs. (5) Competition and skill-focused activity might hinder social interactions. The study confirms that using the innovative reminiscence approach in a program could successfully expand older adults' leisure repertoire and provide benefits to their physical, psychological and social health.

Keywords: Reminiscence, leisure benefit, programming, older adults.

Introduction

The elderly population is increasing dramatically globally. Many nations and professionals are calling for more research to understand how to better enhance the quality of life and health status of seniors [1, 2]. Active engagement in meaningful activities is a critical factor contributing to successful aging[3]. It has been suggested that older adults with an extensive range of leisure repertoire have a higher quality of life and thus a more successful aging experience [4, 5].

Leisure repertoire is defined as "a collection of activities capable of producing perceptions of competence and psychological comfort." [4] Iso-Ahola's curvilinear model indicated that an individual's leisure repertoire starts to increase from birth, peaks in early to middle adulthood and then declines thereafter [6]. Empirical studies have indicated that seniors tend to participate in fewer leisure activities [7, 8] and are less likely to add new activities to their repertoires [7, 9], as they prefer familiarity to novelty [6].

Older adults who have participated in leisure or recreational activities can achieve leisure benefits in different ways. Leitner & Leitner [10] reviewed studies and organized leisure benefits into two major categories: physiological and social/psychological/emotional benefits. Physiological benefits include improved circulation, respiration, physical flexibility, strength, endurance, and reduced blood pressure and cholesterol. The benefits in the social/psychological/emotional realm include higher life satisfaction, feelings of achievement and accomplishment, higher self-esteem, higher perception of self-efficacy, and an improvement in perceived health.

In spite of the well documented benefits of leisure activities for older adults, few programs and studies have incorporated novel programs as an intervention to increase the leisure repertoire of seniors. In addition, little is known about whether there is any difference between older adults' perceptions of leisure benefits while engaging in familiar activities as compared to novel ones.

Hence, the purpose of this study is to use three recreational programs (Petanque, handicraft, and horticulture) in order to assess older adults' leisure benefits. These three programs contrast in two ways: First, they can be examined along the continuum of novelty to familiarity; based on the subjects' previous experience with the programs, the three activities in the present study could be classified as very familiar (handicraft), familiar (horticulture), and novel (Petanque). Secondly, the activities can be evaluated based on differences in the body movements involved, ranging from indoor finger movement (handicraft), outdoor upper limb movement (horticulture), to outdoor whole body movement (Petanque).

Leisure benefits and motor skill learning in older adults

Studies have confirmed these three particular activities to be beneficial to older adults. For example, Simon's [11] study demonstrated that recreational hand activities can improve seniors' hand condition and state-of-mind. Craft activities were originally used by occupational therapists [12] with the idea that people with mental health problems can benefit from the goal-directed nature of such activities [13]. Horticultural activities are a process through which "plants, gardening activities, and the innate closeness we all feel toward nature are used as vehicles in professionally conducted programs of therapy and rehabilitation" [14] and are widely used for older populations [14-16]. Compared to handicraft and horticulture, Petanque [17] is a new activity introduced to Taiwan in 2004. Participants stand inside a starting circle with both feet on the ground and throw metal balls as close as possible to a small wooden ball or jack known as a "Petanque."

As Petanque is an unfamiliar activity for many older adults in Taiwan, therefore its leisure benefits can be contrasted with other more familiar activities. We raise an interesting question in comparison to leisure benefits ascribed to different activities in terms of their previous experience. One distinct characteristic of adult learners is their accumulation of life experience and knowledge [18, 19]. This wealth of previous knowledge and skills can be applied to learn new things including motor skills. Although many studies have revealed that older adults show reduced rates of skill learning [20, 21], recent studies have proven that older adults will make use of previously acquired motor memory to adapt to new modes of movement [22-24]. In other words, older adults can apply general motor skills acquired over a lifetime to learn something new [25].

Reminiscence approach to recreational programming

One innovative and creative idea in this study is the adoption of a life-review method called reminiscence which integrates Erickson's life development theory [26, 27] into the design of the programs. Erickson has identified eight stages of growth and development and their associated tasks across the life span. He emphasized that each stage has a specific associated task to accomplish a goal of positive self-integrity. On the contrary, if the individual does not achieve the goals of a particular task and resolve the problems associated with each stage, identity diffusion will result. Reminiscence programs include storytelling, life review, and defensive reminiscence [28], along with integrative, instrumental, transmissive, narrative, escapist, and obsessive reminiscence programs [29]. Of note, unlike most life-review and reminiscence programs that ask older participants to review and discuss their past life experiences, instrumental reminiscence is used in the present program. This allows the senior to draw upon past experiences, such as past plans, goal-directed activities, and past attempts to overcome difficulties, to solve present problems [29]. This type of reminiscence has been proven to be associated with successful aging.

Characterized by a progressive return to earlier life stages to re-examine and re-integrate one's ego identity, this sort of life review method is widely used by many nursing professionals [30] as well as consulting services [31] for older adults; it has been proven to benefit psychological health [32-34] and reduce depression symptoms in seniors [35, 36]. However, in the field of leisure studies and exercise science, little research has explored the applicability of these methods to improve leisure benefits of older adults in regards to their physical activity.

Methods

Study Sites

This study was a part of a large scale study conducted by the Taiwan National Science Councils —Construct Recreational Service Network for the Aging Society (NSC 97-2420-H-003-009-KF). Sigang town was selected as the sample of the rural communities of Taiwan.

Sigang Town is located in southern Taiwan in Tainan County. This township is divided into twelve villages, and the population of Sigang Town was 25,242 at the time of this study [37]. At that time, 13.88% of the population in Sigang Town were elderly individuals over 65 years old. There are 271 unique health care centers providing community welfare service for the elderly in Tainan County and twelve such health care centers in Sigang Town. According to the Statistics Area Standard Classification [38], Sigang Town is classified as "Sigang Town Inhabitation Place." Therefore, Sigang Town can be viewed as being representative of rural Taiwan.

Sample

At the time of the study, the number of people over 65 years in Sigang Town was estimated to be 3,502 [37]. In order to recruit study participants, the research team set up a recruiting booth at a community-wide festival to distribute flyers containing program information. The participants were limited to individuals aged 65 years and older living in Sigang, Kangdong or in Qingan villages in Sigang Town. Based on their individual preference, the subjects were then divided into three groups: Petanque, handicraft, and horticulture. There were 25, 24, and 21 participants in each group respectively.

Intervention Design

As previously mentioned, Erickson's life development theory was integrated into the design of the three programs in this study [26, 27]. Erickson's work has identified eight stages of growth and development with their associated tasks across the life span of an individual. He emphasized that each stage has a specific task, the accomplishment of which results in positive self-integrity. However, if the individual is unable to accomplish the particular task and resolve the problems associated within each stage, identify diffusion will result. The eight stages and their associated positive psychological pros and cons are as follows: Trust/Mistrust (infant), Autonomy/Shame & Doubt (toddler), Initiative/Guilt (preschool), Industry/Inferiority (schoolchild), Identity/ Role confusion (adolescent), Intimacy/Isolation (young adult), Generativity/Stagnation (mid-adult), Integrity/Despair (late adult).

We tried to integrate the concept of Erickson's life development theory in designing the three programs in this study. For example, in the horticulture class, the instructor showed various seeds to the senior participants and asked them to identify which seeds were familiar and unfamiliar to them in an effort to create rapport and build a trust relationship among the group, the first task in Erickson's development stage. The second task links to Erickson's second stage of development, autonomy, by allowing the participants to choose various pots and tools after an introduction to their use by the instructor. Each program met for 90 minutes a week for a total of five weeks. The details of the recreational programs were as follows:

Table 1: Design of program for three recreational programs based on Erickson's eight developmental stages

Course	Life cycle	Development stage	Handicraft course	Horticulture course	Petanque Course
1	Infancy & Toddlerhood	Trust / Autonomy	Basic folding skill	Introduce related knowledge	Foundation tossing/pitching skill
2	Preschool Age & Childhood Age	Initiative / Industry	Apply multiple skills	Observe growing & Use multiple material	Game rule & Practice skill
3	Adolescence & Early Adulthood	Identity / Intimacy	3D card design	Transplant & Remove unnecessary seedling	Adjust motion & Mature skill
4	Adulthood & Old Age	Generativity / Integrity	Bottle decoration	Planting skill& Decorate	Game time
5	Integrate eight stages	review	Review video and painting	Review video, Sharing, and Painting	Review & Tutor/guide freshman

Instruments

To assess participants' perception of leisure benefits, the study used a questionnaire with a five-point Likert Scale ranging from one (strongly disagree) to five (strongly agree). Higher scores represented higher benefits of leisure experience. The scale consisted of 26 items divided into three categories: physiological benefits, psychological benefits, and social benefits. The score for the leisure benefits categories was calculated from summing the points from each questions and dividing it by the number of questions. The questionnaire had been developed and used by many previous studies with good reliability (Cronbach's Alpha ranges from .88-.90) and validity [39-41]. The same instruments were administered before and after the program intervention to assess the effectiveness at the beginning and end of the intervention.

Data Analyses

Data were analyzed using the SPSS version 18. Descriptive statistics including means were used to describe the characteristics of the sample. A t-test was used to compare the differences between the pre- and post-program results. A One-way ANOVA between-groups analysis was conducted to assess the leisure benefit differences among three experiment groups. A Scheffe-test was used as a post-hoc method to assess the difference. All significance levels were set at .05.

Results

Sample Characteristics

A total of 70 older adults were recruited at the beginning of the program. In the pretest, the participants in handicraft, horticulture and Petanque were 24, 21 and 25, respectively. In the posttest, the participants for handicraft, horticulture and Petanque were 19, 19 and 20, respectively (Table 2). Each group had more female (72.0%~95.2%) than male participants, which represents the actual male/female composition at this age at the rural area in Taiwan. The Petanque group had more

male participants (28.0%) than the other two groups. As can be seen from Table 2, their age is range from 65 to 89 with a mean age of 73 across the three groups. The reliability of the leisure benefits scale is considered acceptable ($\alpha=.95$).

The differences of leisure benefits among groups in the pre-test

In the pre-test, the ANOVA results indicated that 20 items of scales showed non-significant difference, while six items of scales showed significant difference in the leisure benefit scale. In the physiologic leisure benefit perspective, the horticulture group shows significant higher scores in “muscle training”, “increase cardiovascular fitness”, “improve flexibility” than the handicraft group. In the psychological leisure benefit perspective, the Petanque group showed a significantly higher score than the horticulture group in terms of “self-performance”. In the social leisure benefit aspect, the Petanque group shows significant higher scores for “help for others” and “cooperate with others” than the other two groups (Figure 1).

Overall, in the pretest, the horticulture group demonstrates a significantly higher score in physiologic leisure benefits than the handicraft group. The Petanque group demonstrates a higher score in social leisure benefits than the other two groups.

The differences of leisure benefits after the program intervention

An independent-sample t test was conducted to compare the means within each experimental group to depict the difference between pretest and posttest.

1) Petanque experimental group

Seven items of scales indicated significant difference, including five items in the physiological benefit category and two items in the psychological benefit category. However, the social benefit dimension did not show any significant difference at all. These significant items are “balance body and mind”, “muscle training”, “increase cardiovascular fitness”, “improve flexibility”, “learn skills”, “increase contextual experience”, and “appreciate virtue” (Table 3).

Overall, after the Petanque program intervention, the participants had significant enhancement in terms of physiological and psychological leisure benefits but not social leisure benefits (Table 4).

2) Horticulture experimental group

Four items of scales indicated non-significant difference, including “muscle training”, “reduce body fat”, “increase cardiovascular fitness”, “improve flexibility”. In addition, the other 22 items of scale indicated significant difference, including three items of physiologic benefit, ten items of psychological benefit, and nine items with social benefit. In posttest, the average scores of participants in the horticulture group showed a minor increase in four items: “muscle training,” “reduce body fat,” “increase cardiovascular fitness,” and “improve flexibility.” However, these items did not show significant difference (Table 5).

Overall, after the program intervention, the horticulture group had significant improvements in physiological, psychological and social leisure benefits (Table 6).

3) Handicraft experimental group

Four items of scales indicated non-significant difference, including “reduce body fat”, “increase cardiovascular fitness”, “close to nature”, and “understand the relationship between environment and humans”. In addition, the other 22 items of scale indicated significant difference, including five items from the physiologic benefit dimension, ten items of psychological benefit and seven items with social benefit (Table 7).

Overall, for the handicraft group, the responses from the participants demonstrate significant improvement in the physiological benefit dimension, psychological benefit dimension, and social benefit dimension (Table 8).

The differences of leisure benefits in the posttest

The posttest group in this study contained 58 people ($N_p=20$, $N_h=19$, $N_c=19$). The ANOVA results indicated that 17 items of scale showed non-significant difference and 9 items of scale showed significant difference in this scale. In brief, the subjects showed significant difference among the various groups in posttest (Figure 2).

4) Physiologic benefits:

In the posttest, in the physiologic leisure benefit perspective, the means of each item ranged from 3.16 to 4.74. In this dimension, two items showed significant difference. The Petanque group showed a significantly higher score than the handicraft group in two items: “reduce body fat” and “increase cardiovascular fitness”.

Taking all physiological benefit items as a whole, the subjects in the posttest showed significant differences among groups, with means ranging from 4.06 to 4.46. Further, the Scheffe's post-hoc test indicated that the Petanque experimental group scored higher than the handicraft experimental group in the posttest.

5) Psychological benefits:

In the psychological leisure benefits evaluation, the means of each item ranged from 3.58 to 4.84. In this dimension, only one item showed a difference. The horticulture group had a significantly higher score than the Petanque group for “expand knowledge”. Overall, in the psychological benefit dimension, there was a significant difference among groups with means ranging from 4.28 to 4.50, but no significant differences with the post-hoc test.

6) Social benefits:

In the social leisure benefit perspective, the means ranged from 3.21 to 4.95. In this dimension, six items showed significant difference. Besides, the Scheffe's post-hoc test indicated that the horticulture group has a higher score than the other two groups for the following items: “meet new friends”, “close to nature”, “understand the relationship between the environment and humans” and “enjoy the environment.”.

For the overall social benefit dimension, the subjects in the posttest showed significant difference among groups. The Scheffe's post-hoc test indicated that the horticulture experimental group scored higher than the handicraft and Petanque experimental group in the posttest.

Table 2: Frequency/percentage of gender

	Pretest control group	Posttest control group	Horticulture Experimental group	Handicraft Experimental group	Petanque Experimental group
Numbers of subjects	71	49	21	24	25
Minimum age of subjects	65	65	65	65	65
Maximum age of subjects	97	90	90	87	90
Average	76.42	74.92	73.57	74.00	73.84
Standard deviation	7.83	5.97	6.85	6.46	4.54

Table 3: The ANOVA result of experiencing on the benefit of leisure in experimental group (pretest and posttest).

	Pretest					Posttest					
	Pétanque 1	Horticulture 2	Handicraft 3	F	Scheffe	Pétanque 1	Horticulture 2	Handicraft 3	F	Scheffe	
Items / Numbers	25	21	24			20	19	19			
Physiologic benefit	1.Balance body and mind	4.00±1.04	4.00±0.95	3.63±0.71	1.34	4.65±0.59	4.74±0.45	4.63±0.50	0.23		
	2.Escape from environmental stress	3.92±1.22	3.76±0.94	3.38±0.82	1.84	4.05±0.51	4.47±0.61	4.11±0.74	2.61		
	3.Muscle training	3.68±1.03	4.33±0.66	3.08±0.93	10.87*	2 > 3	4.50±0.69	4.16±0.69	4.11±0.88	1.58	
	4.Reduce body fat	3.68±1.07	3.57±0.93	3.04±0.75	3.26*		4.25±1.02	3.74±0.99	3.16±0.60	7.27*	1 > 3
	5.Increase cardiovascular fitness	3.76±1.20	4.05±0.74	3.04±1.04	5.86*	2 > 3	4.65±0.59	4.26±0.81	3.47±0.70	14.20*	1 > 3 2 > 3
	6.Improve flexibility	3.68±1.18	4.43±0.68	3.25±0.61	10.35*	2 > 1 2 > 3	4.50±0.51	4.63±0.50	4.32±0.58	1.69	
	7.Learn skills	3.36±0.95	3.43±1.25	3.21±0.72	0.30		4.65±0.49	4.63±0.50	4.63±0.50	0.01	

* p < .05

Table 4: The t test results of experiencing on the benefit of leisure in Petanque groups (pretest and posttest)

Dimensions	Item	Pretest	Posttest	t test
Physiologic benefit	1.Balance body and mind	4.00±1.04	4.65±0.59	-2.49*
	2.Escape from environmental stress	3.92±1.22	4.05±0.51	-.45
	3.Muscle training	3.68±1.03	4.50±0.69	-3.05*
	4.Reduce body fat	3.68±1.07	4.25±1.02	-1.81
	5.Increase cardiovascular fitness	3.76±1.20	4.65±0.59	-3.03*
	6.Improve flexibility	3.68±1.18	4.50±0.51	-2.89*
	7.Learn skills	3.36±0.95	4.65±0.49	-5.50*
Psychological benefit	8.Release life stress	3.96±1.02	4.45±0.69	-1.84
	9.Increase satisfied	4.20±1.08	4.60±0.60	-1.48
	10.Feel comfort	4.32±1.07	4.75±0.55	-1.63
	11.Entertain daily life	4.12±0.97	4.60±0.60	-1.93
	12.Increase contextual experience	3.88±0.97	4.45±0.69	-2.22*
	13.Appreciate virtue	3.44±0.92	4.30±0.86	-3.21*
	14.Expand the interests	3.72±1.21	4.20±0.62	-1.61
	15.Self-performance	3.44±1.16	3.95±0.89	-1.62
	16.Self-reflection	3.28±0.98	3.65±0.75	-1.40
	17.Expand knowledge	3.48±1.00	3.85±0.93	-1.27
Social benefit	18.Meet new friends	3.80±1.12	4.20±0.77	-1.36
	19.Improve intrapersonal relations	4.08±1.08	4.40±0.60	-1.19
	20.Understand the friends	3.80±1.00	4.35±0.75	-2.05
	21.Help for others	3.76±1.05	3.50±0.76	.93
	22.Self-conscious	3.64±1.11	3.85±0.99	-.66
	23.Cooperate with others	3.80±1.15	4.10±0.72	-1.01
	24.Close to nature	3.48±1.00	3.90±0.91	-1.45
	25.Understand the relationship between environment and humans	3.60±1.19	3.80±0.95	-.61
	26.Enjoy natural surroundings	3.80±1.12	4.05±1.00	-.78

* p < .05

Table 5 The t test results of catalogs of experiencing on the benefit of leisure in Petanque groups (pretest & posttest)

Dimensions	Pretest	Posttest	Homogeneity	t test
Physiologic benefit	3.73±0.95	4.46±0.40	2.66	-3.23*
Psychological benefit	3.78±0.89	4.28±0.45	.84	-2.27*
Social benefit	3.75±0.97	4.02±0.64	.03	-1.06

* p < .05

Table 6: The t test results of experiencing on the benefit of leisure in horticulture groups (pretest and posttest)

Dimensions	Item	Pretest	Posttest	t test
Physiologic benefit	1.Balance body and mind	4.00±0.95	4.74±0.45	-2.97*
	2.Escape from environmental stress	3.76±0.94	4.47±0.61	-3.16*
	3.Muscle training	4.33±0.66	4.16±0.69	.46
	4.Reduce body fat	3.57±0.93	3.74±0.99	-.66
	5.Increase cardiovascular fitness	4.05±0.74	4.26±0.81	-.68
	6.Improve flexibility	4.43±0.68	4.63±0.50	-1.05
	7.Learn skills	3.43±1.25	4.63±0.50	-4.13*
Psychological benefit	8.Release life stress	4.14±0.85	4.68±0.48	-2.25*
	9.Increase satisfied	3.95±0.92	4.74±0.45	-3.44*
	10.Feel comfort	3.90±0.94	4.63±0.50	-2.69*
	11.Entertain daily life	4.10±0.62	4.84±0.37	-4.18*
	12.Increase contextual experience	3.76±0.70	4.68±0.48	-3.78*

	13.Appreciate virtue	3.29±0.64	4.58±0.51	-6.25*
	14.Expand the interests	3.14±0.96	4.53±0.70	-5.35*
	15.Self-performance	2.62±0.74	4.11±0.74	-4.93*
	16.Self-reflection	2.76±1.09	3.58±0.90	-2.83*
	17.Expand knowledge	3.00±0.84	4.63±0.50	-6.28*
	18.Meet new friends	3.43±0.75	4.79±0.42	-5.88*
	19.Improve intrapersonal relations	3.48±0.68	4.95±0.23	-6.53*
	20.Understand the friends	3.52±0.75	4.47±0.70	-3.78*
	21.Help for others	2.48±1.08	3.68±0.75	-5.20*
Social benefit	22.Self-conscious	3.00±1.00	3.89±0.81	-2.96*
	23.Cooperate with others	2.67±1.02	4.58±0.51	-8.83*
	24.Close to nature	3.43±0.51	4.95±0.23	-12.91*
	25.Understand the relationship between environment and humans	3.14±0.96	4.89±0.32	-7.91*
	26.Enjoy natural surroundings	3.19±0.81	4.95±0.23	-10.46*

* $p < .05$

Table 7: The *t* test results of catalogs of experiencing on the benefit of leisure in horticulture groups (pretest and posttest)

Dimensions	Pretest	Posttest	<i>t</i> test
Physiologic benefit	3.94±0.63	4.38±0.36	-14.34 *
Psychological benefit	3.47±0.57	4.45±0.33	-6.82 *
Social benefit	3.15±0.62	4.50±0.37	-10.09 *

* $p < .05$

Discussion

Prior to this study, an application of the reminiscence approach to the seniors' recreational activities had not been implemented and assessed with regard to leisure benefits. The results of this study clearly indicate that, after the intervention of the three programs, the older adults' perception of their physiological, psychological and social leisure benefits were enhanced significantly.

Variance of leisure benefit perception characteristics

As the participants chose the various programs voluntarily, at baseline, there were minor variances in leisure benefit perception among the different groups. The Petanque group had a higher social leisure benefit than the other two groups. Of note, most of the participants in the Petanque group came from a previously formed exercise group, so they already knew each other very well and had had many prior peer interactions within the group. Thus, there was a perceived greater social leisure benefit at the baseline. The horticulture group revealed a higher physiological leisure benefit at the baseline possibly because the study site was in rural Taiwan, and many residents, especially older adults, are farmers. Further, as most of the farm work requires excessive labor, the participants might have associated the horticulture program with extensive physical labor.

The effectiveness of the reminiscence approach on recreational programming for seniors

The main purpose of this study was to exam the effectiveness of three recreational programs that integrate the reminiscence approach to older adults' leisure benefits. Although the life review method has been widely used in many consulting programs for older adults, this method has rarely been applied to recreational activities. The three intervention programs conducted in this study attempted to link to seniors' life experiences in different life stages. The results reveal that recreational programs using the reminiscence approach can significantly improve older adults' leisure benefits. This result is in line with many previous studies showing that the reminiscence method positively correlates with older adults' psychological health [32-34].

In particular, integrating the reminiscence approach allows older adults to recall their prior knowledge and skills, including problem solving skills, and apply them to new recreational activities. In this study, we observed participants benefiting significantly from participating in a brand new activity such as Petanque. The integration of instrumental reminiscence seems valuable in expanding seniors' leisure repertoire.

The differences of leisure benefits among different programs

Although seniors in the three programs improved their leisure benefits, there were variations among the groups in terms of their physical, psychological and social leisure benefits. Despite the fact that the benefits of participating in leisure activities are well-known, less is known about any possible difference between older adults' perceptions of leisure benefits while engaging in familiar activities as compared to novel activities. Due to the different characteristics of the three programs in terms of familiarity and body movement, the subjects' perception of leisure benefits differed at the end of the program compared to their perception at the pretest. Following is a detailed description of the associations.

The variance of motor skills in older adult's leisure benefits

For this experiment, the three recreational programs required different physical movements: single finger movement (handicraft), upper limb movement (horticultural), and whole body activity (Petanque). At the posttest, the Petanque group had significantly higher physiological leisure perception in terms of reduction of body fat and increased cardiovascular fitness in comparison to the handicraft group. The horticulture group also had significantly higher cardiovascular fitness leisure benefits than the handicraft group. Based on these results, the seniors from the different programs do have a different physiological leisure benefit perception according to the characteristic of physical movement for each program. Therefore, the programs involving more motor skills and large muscle groups improved seniors' physiological leisure benefits.

Psychological leisure benefits as linked to the "newness" of programs

With the familiarity of three programs ranging from familiar (handicraft) to novel (Petanque), we expected that seniors would gain more psychological leisure benefits from the novel programs. Surprisingly, seniors from the horticulture group showed a higher psychological leisure benefit in terms of expanding knowledge in comparison to the Petanque group. One explanation for this difference is that as most of the participants were familiar with traditional agriculture activities for crop production, they lacked the experience of designing gardening activities. Using plants in creative ways, such as using the plants as a doll's hair, adds newness in the older adults' experiences. Adding this newness in a familiar activity as opposed to a brand new one expands older adults' knowledge which in turn increases their psychological leisure benefits.

Competition and skilled focused activity as a hindrance to social interactions

After the program interventions, the Petanque group improved significantly in physiological and psychological leisure benefits but not in social leisure benefits. The reason might be two-fold: first, at the baseline; the Petanque group already had the highest score in social benefit as most participants already knew each other from the exercise group. Secondly, as the activity was competition-oriented, the participants spent most of the time practicing their skills. This focus on personal skill development hindered interaction with others. In contrast, in the handicraft group, the program participants had plenty of interactions with others when they helped to glue an object, exchanged papers, and complimented or joked about others' work. These interactions fostered the participants' social leisure benefits. Overall, competition-oriented activity motivates learners to achieve the desired learning goals. However, too much emphasis on competition might impede social interactions.

Conclusion

The central finding of this study was that after the integration of the reminiscence approach in older adults' recreation activities, participants from the three groups all gained substantial leisure benefits. In particular, integrating the reminiscence approach allowed older adults to apply their knowledge and skills they have possessed such as the problem solving skills to new recreation activities. Thus, the integration of the reminiscence approach seems valuable in expanding seniors' leisure repertoire. In addition, this study clarifies which program benefits older adults' leisure perception in specific ways. The results clearly indicate that: (1) programs involving motor skills are result in physiological leisure benefits; (2) the "newness" factor of adding creative elements to activities that seniors are already familiar with might increase seniors' psychological leisure benefits; (3) programs that focus too much on competition and skill development might hinder social interactions among the group. These findings provide notable implications for future senior recreation program development. Overall, using the innovative reminiscence approach in a program could successfully expand older adults' leisure repertoire and provide benefits to their physical, psychological and social health.

For the current study, because participants selected the program in which they wished to participate, their motivations may have interfered with their perception of leisure benefits among the different groups. In addition, as the intervention only lasted for five weeks, the effect of the experiment might not sustain a significant difference. Further research is needed to replicate the findings and examine other older adults' recreation activities using the life review method with a random sample and for a longer time period.

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