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Analysis on Live experience, Flow, Health perception and Inner Psychological Perception in Relation to Time Spent in the Forest [1]

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숲에서 보낸 시간에 따른 체험,몰입,건강지각과 심리내적인식 분석[1]

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ABSTRACT

Though various studies have analyzed the impact of physically being in the forest, consideration of the time factors is omitted in many of them. Since space and time mutually affect each other, the effects that resulted by the space factor can change when the time factor is introduced. In this paper, the focus was made on how the time spent in the forest influences the four resulting factors: live experiences, flow experiences, health perception and inner psychological perception. This research is based on the surveys taken from April to October, 2014. The focus of the questionnaire was to measure 'Live Experience (LE)', 'Flow (FL)', 'Health Perception (HP)' and 'Inner Psychological Perception (IPP)' levels among the participants. The respondents of the survey aged between 40 and 70, participating in Forest or ecological courses, living in the Northern area of Chungchungnam-do province of Korea. Additionally their past experiences ranged from as little as one year to as long as twenty years in forest related fields. It will be shown that the time spent in the forest affects the levels of LE, FL, HP, IPP, increasing them in proportion to the time with statistical significance. This result would be useful not only for those who are in charge of creating forest healing programs but also for people who study forest healing. Because the time spent in the forest influences the levels of LE, FL, HP, IPP, the forest healing programs will benefit by taking this result into consideration.

KEY WORDS: FOREST HEALING, HEALING PROGRAM, PHYSICAL EFFECT

요 약

숲 공간의 영향에 대한 많은 연구들이 있는 반면 시간요인에 대한 연구들은 부족하다. 공간과 시간은 동시적으로 상호간에 영향을 미치기 때문에 공간요인에 의한 영향들은 시간에 의해 변화할 수 있다. 본 연구는 숲에서 보낸 시간의 4가지 요인들(체험, 몰입, 건강지각과 심리내적 인식)에 대한 영향에 초점을 두었으며, 2014년 4월부터 10월까지 설문을 통해 이루어졌다. 설문지는 체험 (LE), 몰입(FL), 건강지각(HP)과 심리내적인식(IPP)으로 구성되었다. 대상자들은 충청남도 이북지역에서 살고 있으며 생태 숲해설 과정이나 생태교육과정에 있는 사람들로 40-70세였다. 이들은 또한 1년에서 20년에 이르는 숲관련 경력을 가지거나 일을 하고 있는 사람들이었다. 체험, 몰입, 건강지각과 심리내적 과

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같은 요인들은 숲에서 보낸 시간의 영향을 받는 것으로 나타났으며, 이 요인들은 통계적으로 유의한 수준에서 숲에서 보낸 시간에 따라 증가하는 것으로 밝혀졌다. 이 연구는 산림치유프로그램을 기획하는 사람들뿐만 아니라 산림치유를 공부하는 사람들에게도 유용할 것이다. 숲에서 보낸 시간이 체험, 몰입, 건강지각과 심리내적 인식에 영향을 주기 때문에 이 점을 산림치유프로그램에서 고려해야 한다.

주요어: **산림치유**, **치유프로그램**, **신체적 효과**

INTRODUCTION

Increasing interests in psychological and physical health, people who participate in activities like forest walking for refreshment amid of flowers, trees and fresh air benefit from some positive effects. These effects could be classified into physical and psychological effects of Forest Healing. Many studies have shown the increasing interests especially among the people who are concerned with their health and revealed the effects of the Forest on the four of the five senses on human: sight, hearing, smell and touch. Interests in environmental stress have been growing and evidence has shown that environment can cause serious stress in people living in urban areas (Ulich R.S. et al., 1991).

Factors which construct forest-healing program have an effect on physical, psychological health, flow and etc. through experience and both temporality and spatiality act as essential factors. While a lot of studies about effects of programs which are performed in the space called forest, few studies was done about temporality of program. Temporality are closely related with human experience and shared with everyone, discussion about temporality or time was stared as philosophicaldiscussion. Kant stared to investigate the definition of temporality or time from the dimension of human consciousness. Kant's influence about time was appeared in Bergson(1859-1941) and Husserl (1859-1938), the concept of temporality or time which was defined by phenomenologist does not mean objective time and time of experience world but internal time of consciousness progress. (Cho G. J. ,2009) Subjective time which an individual experience such as social time exists comparing with objective time such as physical and biological time. This subjective temporality or time is influenced by emotional stimulation (koster.2004; Park S.B. 2013) The concepts of spatiality and temporality are treated as both important issues and fundamental concepts to understand the world in natural science. (Kwon S.Y. ,2002)

Therefore, social interest on forest healing is spreading rapidly, along with the increased needs for the evidences, requiring various researches on forest healing which shall be promoted by society. Kim's study (2012) suggested three effects of physical activities in the forest.

First, physical activities performed in forest will enable people to feel sense of unity with nature through its unique fragrances, sounds, shades of the trees which will generate the positive effects on them.

Second, phytoncide and terpene in the forest contribute to mental relaxation and health promotion by getting rid of stress and virus. Also a negative ion in the forest helps to control autonomic nervous system and improve blood circulation. Forest itself helps to revitalize NK-cell's activities which control increasing cancer cells. It is considered that activities in the forest is much helpful than activities in the urban environment.

Finally, activities in the forest protect our body from cerebrovascular diseases which are fatal in the modern time, thereby improve breathing capacity and blood circulation.

Like this the effects from the forest comes from not only space factors but also time factor. Because space and time exist together. Forest provides the best environment for various living creatures to be in harmony with nature. Just by encountering it, our bodies feel healthier and more pleasant because membrane receptors in our body receive comfortable information from the environment. Environmental information provided by the forest include not only fragrant substances like phytoncide but also invisible energies from natural view, sunlight, water, soil, rock, trees and plants. In Lee's study (2003) titled "The effects of forest fragrant substances to anxiety, depression, three times of 1 hour session were implemented for 7 days; 19

university students took part in the study. They were exposed to forest's fragrant substances for the session. It is considered that the exposure time may have affected the results.

Purpose

It is necessary to study about both spatiality of forest and temporality which could have a potential effect when people do activities and experience programs in forest. When cause and effect are given phenomenons which happens during the process are caused by temporality. Our body could be said to exist in neither space nor time. (Cho G.J,2009)

Forest healing is considered as profits gained through visiting or experiencing a forest. Many studies have shown that people improve mental, psychological and physiological, physical health through forest. Here, an analysis of the correlation between the time of staying in the forest and factors of forest will be carried out. Therefore it is not possible to separate spatiality of forest and temporality which people experience in forest. hypotheses below are influenced by time.

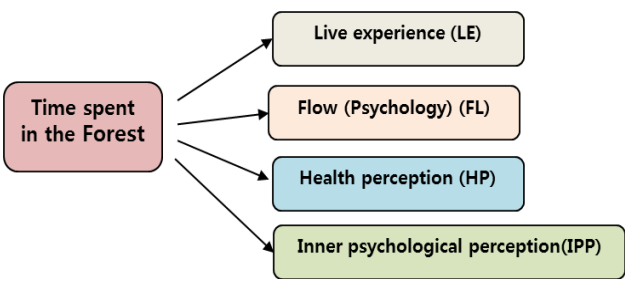

Figure 1 the model of hypotheses

MATERIALS AND METHODS

1. Subject

Subjects were 40~70 years old participants of forest explanation course or ecological course living in the northern area of Chungnam. They had forest-related career and had worked for 1 year to 20 years.

2. Research plan

Prior tests were carried out twice before the main survey; we tested the suitability of the context through experts' review and analysis. A survey was carried out from April to October in 2014. The questionnaire measures the degree of "The live experience", "Flow (psychology)", "Health perception" and "Inner psychological perception"

After collecting 290 questionnaires, 11 questionnaires were excluded because of their lack of information. 279 questionnaires were analyzed finally in SPSS 18. Analysis of frequency, factor analysis, reliability analysis and Kruskal- wallis analysis were conducted in this study.

3. Measurement

1) Live experience scale

This is a self-developed scale including primary factors which is important in Forest live experience. It is composed of 9 questions which went through 10 experts' review using 7 Likert scale. The reliability degree in this study was .823.

2) Flow (psychology) scale

On a basis of Csikszentmihalyi(1975,1990)'s flow theory, 4 questions using 7 Likert scale was made through 4 experts' review. The reliability degree in this study was .804.

3) Health perception scale

This was developed by Han & Jang(2004). The reliability degree in this study was .910.

4) Inner psychological perception scale

'Inner psychological perception' is one of the sub scales of the congruence scale developed by Go(2008). The reliability degree in this study was .886.

9 questions measured the degree of Live experience; 4 measured the degree of Flow; 6 questions measured the degree of Health perception; 10 questions measured the degree of Inner psychological perception.

Live experience scale was created and checked by ten experts who work on forest healing and psychology. AMOS18 confirmatory factor analysis was implemented. The model of this scale was checked focusing on TLI, CFI and RMSEA which values were recommended by Hong(2014). TLI = .970, CFI = .984, RMSEA = .062 were proper for fitness index; *Cronbach* α value was 0.771

which were also fine to proceed to the next analysis. Flow experience scale is made based on Flow experience theory by Csikszentmihalyi. Five experts checked 4 questions to find out whether they are suitable or not. Reliability test results were both over 0.7 at two prior tests; its *Cronbach* α value was 0.81. Health perception scale was developed and used by Han and Jang(2003).

Using 7 likert scale the questionnaire were made and implemented; its *Cronbach* α value in this study was 0.91. Inner psychological perception scale is one of consistency scales.

Its *Cronbach* α value was 0.88 in this study which were higher than the original one.

RESULTS AND DISCUSSION

Over 70% of people were female participants in the forest explanation course or the ecological course. Over 90% of people were highly educated even though they were all over 40 years old. The ratio of having a religion was similar between yes and no group. Participants in the forest explanation course or the ecological course had forest-related job. This could be a limitation of this study. Another study with people who are having a various jobs will be needed in the future.

Table 1. General information

		frequency	%
Gender	Male	75	26.9
	Female	204	73.1
Marriage	Unmarried	32	11.5
	Married	247	88.5
Education	Graduate school	118	42.3
	University	135	48.4
	High school	26	9.3
Religion	No	144	51.6
	Yes	135	48.4
Occupation	Job related to forest	174	62.4
	clerical	9	3.2
	professional	51	18.3
	Service	9	3.2
	Self-emplayed	17	6.1
	Etc.	19	6.8
Age	40s	68	24.3
	50s	199	71.3
	Over 60	12	4.3

1. Factor and reliability

Factor analysis was used to derive from a number of given variables a smaller number of different, more useful variables; reliability analysis was also implemented to figure out that a scale used in this study should consistently reflect the construct it is measuring.

Measure-variables were eliminated through scale purification process. First, exploratory factor analysis was implemented to test the validity. For all the measure variables principle component analysis was used to extract organization factors, and varimax was chosen to simplify factor loading value. Criteria of factor values were all over 0.4 in this study.

Cronbach α values were over 0.7 in all items, alpha if item deleted values were all lower than that. Items which hinder the confidence level did not exist; therefore all items were used for the next analysis.

2. Correlation among variables

To figure out the correlation among variables Correlation Analysis was used for this study.

There is a direct correlation among all variables under 0.01 of significance level. The correlation of live experience, flow, health perception and inner psychological perception is shown as below:

Table 2 the result of correlation analysis

	M	S.D.	LE	FL	HP	IPP
LE	5.803	0.731	1			
FL	5.647	0.925	**0.262	1		
HP	4.869	0.994	**0.231	0.08	1	
IPP	5.625	0.721	**0.314	**0.253	**0.419	1

* $p<0.05$, $^{**}p<0.01$

In the table above the correlations were statistically relevant between live experience and other three factors, flow and inner psychological perception, health perception and inner psychological perception. The correlation values were meaningful under 0.01 of the level of significance.

3. differences among 3 groups's mean values

When normal distributions are not shown it is impossible to compare differences among 3 groups's mean values. In this case non-parametric test is used and Kruskal –wallis test was used for this study.

Kruskal-wallis tests were done to test the correlation of LE, FL, HP and IPP with the time spent in the forest. 1-2 hours, 3-4 hours, 5-6 hours and over 7 hours were the four groups for the time factor.

Chi-square values of LE, FL, HP and IPP were 54.992, 87.802, 35.371 and 44.956, respectively.

Kruskal-wallis tests were done to test the correlation of LE, FL, HP and IPP with the time spent in the forest.

Table 3 the result of kruskal wallis test

	LE	FL	HP	IPP
chi-square	54.992	87.802	35.371	44.956
DF	3	3	3	3
p	.000	.000	.000	.000

1-2 hours, 3-4 hours, 5-6 hours and over 7 hours were the four groups for the time factor.

The results were shown as below:

LE, FL and IPP have increased, with statistical significance, in proportion to the time spent in the forest.

The levels of HP among the three groups—1-2 H, 3-4 H and 5-6 H groups—showed no significant differences.

However, the average points of the 1-2 H group and over 7 H group turned out to be different with statistical significance.

The result shows that the HP level is prone to a marked increase if people stay in the forest for more than 7 hours.

It was necessary to investigate about effect of temporality or time on physical and psychological health and flow. The paper proves that the LE, FL, HP and IPP factors are influenced by the time spent in the forest. Therfore it is essential to consider the effect of temporality of forest activity to plan or implement forest activity program.

The results in the paper would be useful for both designers of the forest program and students who study the forest healing. Forest healing programs should be modified based on the fact that the time spent in the forest affects the LE, FL, HP and IPP.

Table 4 the result of Mann-whitney U test

Dependent variable	Time of stay(hour)	M	S.D.	Test for homogenicity of variances	F / p	Post-hoc comparison
LE	1-2 (a)	5.7488	0.4549	0	21.198/0.00	a<b<c<d
	3-4 (b)	6.0114	0.7666			
	4-6 (c)	6.0662	0.6557			
	7+ (d)	6.8611	0.1099			
FL	1-2 (a)	5.0573	0.7112	0	32.736/0.00	a<b<c<d
	3-4 (b)	5.8341	0.7867			
	4-6 (c)	5.9183	1.0798			
	7+ (d)	6.6042	0.3679			
HP	1-2 (a)	4.5816	0.9387	0	12.479/0.00	a<d
	3-4 (b)	4.8879	0.9988			
	4-6 (c)	4.6378	0.9877			
	7+ (d)	5.8403	0.1665			
IPP	1-2 (a)	5.4609	0.7360	0	18.471/0.00	a<b<d
	3-4 (b)	5.9463	0.5569			
	4-6 (c)	5.2837	0.7686			
	7+ (d)	6.0278	0.1567			

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