The Influence of Health Concern on the Relationship between Lifestyle Activities and Cognition in the Elderly

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- ABSTRACT -

The Influence of Health Concern on the Relationship between Lifestyle Activities and Cognition in the Elderly

The aim of this study was to examine the effect of health concern on lifestyle activities, such as physical, mental, social activity (PA, MA, or SA), and cognition in the elderly. The subjects were divided into 4 groups. We developed health concern and activity model (HCA) based on the responses to HC and the 3 activities. Group 1 comprised subjects with “little or no HC” and “no” activity, group 2 comprised subjects with “much HC” but “no” activity, group 3 comprised subjects with “little or no HC” but engaged in 1 or more activities, and group 4 comprised subjects with “much HC” and engaged in at least 1 activity. Data were obtained from 3157 subjects aged 60 years and above. Cognitive function was assessed by the Korean version of the Mini-Mental State Examination (K-MMSE). A cross-sectional, factorial design was used in which the K-MMSE score was the dependent variable, with physical, mental, and social activity as one factor and health concern as the other. Analysis of covariance revealed significant differences in the K-MMSE score between all 4 groups. Group 2, with only concern had the lowest K-MMSE score. Group 1 showed higher K-MMSE score than group 2 but it was lower than group 3. Group 4 had the highest K-MMSE score among the 4 groups (Group 2<Group 1<Group 3< Group 4, $p<0.001$). In the non-cognitive impairment (NCI) group, with K-MMSE score greater than or equal to 18, only group 4 showed significantly higher K-MMSE score ($p<0.001$). The other groups showed no significant differences. In the cognitive impairment (CI) group, the K-MMSE

score of group 3 and 4 were significantly higher than group 1 and 2. There were no significant differences in K-MMSE score between group 3 and group 4. K-MMSE scores of group 1 and group 2 showed no significant differences. Multiple regression analysis showed that PA, MA, and SA were all associated with cognition after adjustment for age, sex, educational level, current smoking, and current alcohol consumption for all subjects ($p < 0.001$, $p = 0.001$, $p < 0.001$ for PA, MA, and SA, respectively). In the NCI group PA, MA, and SA were all associated with cognition ($p = 0.001$, $p < 0.05$, $p = 0.037$ for PA, MA, and SA, respectively). In the CI group, only SA was associated with cognition ($p < 0.001$).

The results suggest that having HC has a positive influence on cognition in the elderly when the subjects are engaged in physical, mental, or social activities. Only having HC, engagement in activities with no HC, or having none of the above, seems to be not enough in keeping cognition healthy, especially in the NCI group. In the CI group, engagement in activities is the common positive factor. Having HC did not have a significant influence on cognition in the CI group. Among the activities all three activities had positive association with cognition in the NCI group and only SA was associated with cognition in the CI group. The results may support the evidence that when there is capacity in the cognitive reserve, all of the activities are beneficial. But, with adequate HC, it is even better.

Key Words: Physical Activity, Mental Activity, Social Activity, Health Concern, K-MMSE

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I. INTRODUCTION

During recent years, numerous studies have examined the association of physical activity (PA), mental activity (MA), and social activity (SA) with cognitive function (Karp et al., 2006). Regular PA has been shown to be an important protective factor against cognitive decline in elderly persons (Laurin et al., 2001). Recent meta-analysis found that PA produced a positive effect on cognition, particularly on executive functions (Colcombe and Kramer, 2003). Epidemiological studies suggest that mid- and late-life exposure to enriched or complex environments that require MA has beneficial effects on cognition and on the risk for dementia (Wang et al., 2002; Verghese et al., 2006). Moreover, frequent participation in MA, such as cognitively stimulating activities for the elderly, has been found to be associated with a reduced risk of Alzheimer disease (AD) (Wilson et al., 2002). Social networks, if small in quantity and low in quality, not only increase mortality but also accelerate cognitive decline (Fratiglioni et al., 2004). Many other studies suggest that PA, MA, and SA may have protective effect against cognitive decline and dementia in the elderly.

Due to increase in human longevity, interests in preserving physical and mental health are rising. Self-rated health is a subjective measure of personal health that is distinct from objective measures and is known to be a predictor of mortality in the elderly; it is also predictive of survival in individuals with mild to moderate dementia (Walker et al., 2004). However, self-rated health does not reflect one's personal interest or concern for health. Health concern (HC) increases as we age, but HC does not necessarily lead to engagement in activities that help maintain physical and mental health in the elderly, especially in regard to cognitive function. As far as we know, there are no studies that focus on the effect of HC and

engaging in PA, MA, and SA on cognitive function in the elderly.

We hypothesize that engagement in PA, MA, and SA, as well as having HC, is more closely associated with better cognitive function in the elderly than just having HC. Moreover, we hypothesize that HC will have different effects on the elderly who do not show cognitive impairment (NCI) and those who show cognitive impairment (CI).

II. SUBJECTS AND METHODS

A. Subjects

This study is part of Gwangju Dementia and Mild Cognitive Impairment Study (GDEMCIS), a large, longitudinal study of people aged 60 years or older in the Korean community. Details of the study design are described elsewhere (Lee et al., 2009). Starting with a sample of 3445 persons, after the initial interview, 190 subjects with incomplete data were excluded and another 98 subjects were excluded who met the following criteria: a history of significant hearing or visual impairment that rendered participation in the interview difficult, a history of neurological disorders (e.g., stroke, Parkinson's disease, or active epilepsy), a diagnosis of psychiatric illness (e.g., schizophrenia, mental retardation, severe depression, or mania), current treatment with psychotropic medications, or history of alcohol and other substance abuse. A total of 3157 subjects were included in the analysis. Informed consent was obtained after providing a complete description of the study to the subjects and their relatives. This study was approved by the Severance Mental Health Hospital Institutional Review Board.

B. Assessments and measurements

The study protocol included cognitive screening through the Korean version of the Mini-Mental State Examination (K-MMSE), which has been validated for the Korean-speaking population (Kang et al., 1997), recording of the subject's medical history, and a detailed physical examination with an emphasis on neurological signs and symptoms. A community based study in Korea defined the cutoff point for screening dementia as K-MMSE score of 17/18; the sensitivity and specificity of the findings were 91% and 86%,

respectively (Kang et al., 1997). Based on these results, we defined CI as a K-MMSE score less than or equal to 17, and we defined non-CI (NCI) as a K-MMSE score greater than or equal to 18.

In the interview, the subjects were asked to check one of three responses ("not concerned," "have little concern," and "have much concern") to a question about their own health. Subjects who answered "not concerned" or "have little concern" were placed in the "little or no HC" group, while those who answered "have much concern" were placed in the "much HC" group.

To assess PA, MA, and SA of the subjects, we asked questions about each activity. The subjects were to answer either "yes" or "no" for the first part of the assessment; a "yes" was to be given if subjects were involved in one or more activities in each category; a "no" was to be given if the subject was not involved in any of the activities.

For assessment of PA, the subjects were asked if they were currently engaged in regular physical exercise such as slow to brisk walking, stretching, farming, household work, looking after grandchildren, running, hiking, aerobics, and cycling. If the subjects answered "yes," they were asked the type of PA they enjoyed and the amount of time they spent engaged in that activity per week.

MA was assessed by asking the subjects if they were engaged in any form of MA such as reading the newspaper or a book, listening to the radio, drawing, calligraphy, Korean poker, chess, taking courses, writing, learning a foreign language, or learning to operate a computer. If their answer was "yes," they were asked to specify the length of time they engaged in the activity per week.

SA was assessed by asking the subjects if they were involved in any organizations

or clubs, religious organizations, social gatherings, senior houses, culture classes, volunteering, working for the alumni, or if they had a permanent job. If the subject answered "yes," they were asked the length of time they typically spent per visit and the number of attendance per week.

C. Definition of health concern and activity model

Table 1. Health concern and activity model

		Any one or more of PA[a]/MA[b]/SA[c]	
		No	Yes
Health concern	Some or no interest	Group1	Group3
	Much interest	Group2	Group4

[a] PA = physical activity, [b] MA = mental activity, [c] SA = social activity

We developed a composite index called health concern and activity (HCA) based on the responses to HC and the 3 activities shown in Table 1. Group 1 comprised subjects who responded as having "little or no HC" and "no" activity. Group 2 comprised subjects who responded as having "much HC" but "no" activity. Group 3 comprised subjects who responded as having "little or no HC" but engaged in 1 or more of the 3 activities (PA, MA, or SA). Group 4 comprised subjects who responded as having "much HC" and who were also involved in at least 1 of the 3 activities.

D. Statistical analysis

Categorical variables were compared with the χ^2 test, and continuous variables were compared by analysis of variance (ANOVA) for each of the groups. We conducted analysis of covariance (ANCOVA) by regressing the HCA model on K-MMSE after adjusting for age, sex, educational level, current smoking, and current alcohol consumption for all subjects, the CI group, and the NCI group. Post hoc test (Tukey's HSD) was used to determine any significant group differences. Multiple regression analysis was used to identify the effect of PA, MA, and SA on cognition after adjusting for age, sex, educational level, current smoking, and current alcohol consumption for all subjects, the CI group, and the NCI group. A difference with $p < 0.05$ was considered statistically significant (SPSS version 13.0 was used for all analyses).

III. RESULTS

A. General characteristics of the subjects

Table 2. Distribution of demographic and health characteristics of participants according to combination model by health concern and PA/MA/SA

		Total	Group 1 (n = 228)	Group 2 (n = 88)	Group 3 (n = 1836)	Group 4 (n = 1005)	F or χ^2	p/ Post Hoc*
Age (y)[a]		72.3±6.76	73.5±8.00	75.7±6.57	72.6±6.86	71.0±6.02	23.99	<0.001 4<3,1<2
Sex[b] n (%)	M	999	81(35.5)	50(56.8)	527(28.7)	341(33.9)	37.14	<0.001
	F	2158	147(64.5)	38(43.2)	1309(71.3)	664(66.1)		
Education (y)[a]		4.8±4.50	3.5±4.00	4.0±4.39	4.4±4.35	5.7±4.73	25.94	<0.001 1<3<4, 2<4
Current smoking n (%)[b]		364	44(12.1)	15(4.1)	193(53.0)	112(30.8)	18.13	<0.001
Current drinking n (%)[b]		676	54(8.0)	29(4.3)	354(52.4)	239(35.4)	15.97	0.001
K-MMSE score[a]		21.8±4.89	19.3±5.92	18.2±6.14	21.6±4.78	23.0±4.28	57.63	<0.001 1,2<3<4

[a] ANOVA test, [b] Chi-square test for trend, *Post-hoc analysis: Tukey's HSD

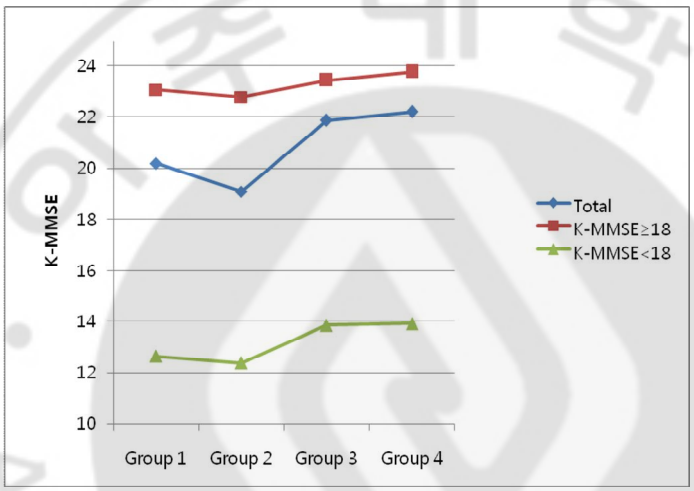
K-MMSE = Korean version–Mini Mental State Examination

The general characteristics of the subjects in each of the HCA model groups are shown in Table 2. Of the 3157 subjects, 999 were male (31.6%), and 2158 were female (68.4%). The mean age of the subjects was 72.3 ± 6.8 years, average educational level was

4.8 ± 4.5 years, and mean K-MMSE score was 21.8 ± 4.89. Among the participants, 11.5% (n = 364) were current smokers, and 21.4% (n = 676) were current drinkers. There were significant differences between all groups with respect to all variables tested.

B. Group differences in K-MMSE scores

Fig. 1. The estimated marginal means of K-MMSE for 4 groups after adjusting for age, sex, educational level, current smoking, and current alcohol consumption using ANCOVA



Total: Group 2 < Group 1 < Group 3 < Group 4 ($p < 0.0001$)
K-MMSE ≥ 18: Group 1, Group 2, Group 3 < Group 4 ($p < 0.0001$)
K-MMSE < 18: Group 1, Group 2 < Group 3, Group 4 ($p < 0.0001$)

The Figure illustrates estimated marginal means of K-MMSE of the 4 groups after adjusting for age, sex, education, current smoking, and current alcohol consumption as determined by ANCOVA. There were significant differences in K-MMSE score between all 4 groups after adjusting for age, sex, education, current smoking, and alcohol consumption in the total subjects ($F = 33.84$, $df = 3$, $p < 0.001$). In the NCI group, Group 4 had a significantly higher K-MMSE score than the other groups ($F = 6.42$, $df = 3$, $p < 0.001$); in the CI group, Groups 3 and 4 had significantly higher K-MMSE scores than Groups 1 and 2

after adjusting for age, sex, education, current smoking, and alcohol consumption (F = 4.93, df = 3, p = 0.002).

C. Effect of each activities on cognition in the total subjects, NCI group, and CI group

Table 3. Multiple regression analysis for cognition (K-MMSE) after adjusting for age, sex, educational level, current smoking, and current alcohol consumption

	Total		K-MMSE ≥ 18		K-MMSE < 18	
	B(SE)	*p*	B(SE)	*p*	B(SE)	*p*
Intercept	35.898(0.922)	<0.001	28.438(0.712)	<0.001	23.291(2.048)	<0.001
Age (y)	-0.222(0.010)	<0.001	-0.089(0.008)	<0.001	-0.131(0.022)	<0.001
Sex: male	-0.902(0.187)	<0.001	-0.441(0.137)	0.001	-0.229(0.479)	0.632
Education (y)	0.431(0.018)	<0.001	0.289(0.013)	<0.001	0.044(0.063)	0.485
PA	0.961(0.146)	<0.001	0.373(0.113)	0.001	0.426(0.283)	0.132
MA	0.606(0.181)	0.001	0.464(0.128)	<0.001	0.387(0.731)	0.597
SA	0.865(0.140)	<0.001	0.223(0.107)	0.037	1.170(0.290)	<0.001
Current Smoking	-0.392(0.223)	0.078	-0.042(0.167)	0.802	-0.461(0.484)	0.341
Current Alcohol	0.414(0.194)	0.033	0.152(0.142)	0.285	0.373(0.493)	0.449

Total: Adjusted R^2=0.437, K-MMSE ≥ 18: Adjusted R^2 =0.312, K-MMSE < 18: Adjusted R^2 = 0.091

Multiple regression analysis revealed that PA, MA, and SA were all associated with cognition after adjustment for age, sex, educational level, current smoking, and current alcohol consumption for all subjects (R^2 = 0.44; B = 0.961 and p < 0.001, B = 0.606 and p =

0.001, and B = 0.865 and $p < 0.001$ for PA, MA, and SA, respectively).

Multiple regression analysis also revealed that PA, MA, and SA were all associated with cognition after adjustment for age, sex, educational level, current smoking, and current alcohol consumption in the NCI group ($R^2 = 0.31$; B = 0.373 and p = 0.001, B = 0.464 and $p < 0.05$, and B = 0.223 and p = 0.037 for PA, MA, and SA, respectively). In the CI group, only SA was associated with cognition after adjustment for age, sex, educational level, current smoking, and current alcohol consumption (B = 1.170, $p < 0.001$).

IV. DISCUSSION

In this study, we developed the HCA model to study the importance of putting thoughts into action. The results showed that engagement in activities (PA, MA, or SA) and having HC simultaneously is more closely associated with good cognitive function in the elderly. In all subjects, cognitive function was highest in Group 4, even after adjusting for age, sex, education level, current smoking, and current alcohol consumption. Group 3, Group 1, and Group 2 followed in the given order. The results may suggest that having HC while engaging in activities has a more positive influence on elderly cognition than just participating in activities without HC. The subjects who did not participate in activities and had no HC had lower K-MMSE score than those who participated in activities but their K-MMSE scores were higher than those who had only HC. It may be possible that subjects in Group 2 had physical illnesses that preclude them from actually participating in PA, MA, or SA even though they had HC. Depression or anxiety symptoms may be another reason. The subjects' had HC but loss of interest, fatigue, or other psychiatric symptoms may have interfered participating in lifestyle activities. In Group 1 the subjects are just not interested. This certain group may have no physical or mental illnesses that alert them to have HC or engage in activities.

In the NCI group, Group 4 showed significantly different in K-MMSE scores from Groups 1, 2, and 3. Difference in K-MMSE scores between Groups 1, 2, and 3 were not significant. The findings suggest that the effect of engagement in activities without HC on cognition of NCI elderly is not so different from the effect of no engagement in activities with or without HC. This may show that the presence of HC in association with engagement in activities is most helpful in sustaining higher cognitive function in the NCI elderly.

In the CI category, Groups 3 and 4 showed significant differences from Groups 1 and 2, but differences between Group 3 and Group 4 were not significant. In other words, engagement in activities, with or without HC, is more helpful for sustaining higher cognitive function in the CI elderly than not being engaged in activities. Persons with dementia suffer from a condition known as anosognosia, an inability to acknowledge their cognitive and functional impairments. This may explain the triviality of HC in the CI group. With anosognosia, the patients have less reason to be concerned for their health. Nonetheless, the results suggest that patients that are encouraged to engage in activities seem to have better cognition than left alone.

The results from multiple regression analysis showed that PA, MA, and SA had significant correlation with cognition, even after adjusting for age, sex, education level, current smoking, and alcohol consumption in the NCI group. However, in the CI group, only SA showed significant correlation with cognition. Cognitive reserve hypothesis maybe used to explain the differences in results between the NCI and CI groups. In individuals with remaining functional brain capacity, PA, MA, and SA evidently will help prevent or delay the process of atrophy. In individuals with CI, when cognitive reserve is overwhelmed by accumulating brain pathology, PA and MA may not be easy to perform more or less helpful. SA does not involve vigorous physical or mental activities but it does promote behavioral, psychological, and physiological changes that lead to positive biological changes in the body (Berkman et al., 2000). This may be enough for the CI group. Another consideration is that, subjects who are able to participate in SA are the ones with better cognitive function without behavioral and psychological symptoms of dementia (BPSD) within the CI group. These results are from cross-sectional data however, so cause and effect should be discussed

through longitudinal study results.

There are recent studies that explain how PA, MA, and SA affect cognitive functioning. The three activity components seem to have specific mechanisms but they may share common pathways, acting simultaneously. In regard to PA, animal models have shown that running promotes stem cell proliferation and differentiation more than any other activities such as socialization and problem solving (van Praag, Kempermann, et al., 1999). Running also enhances neurogenesis, learning, and long-term potentiation (van Praag, Christie, et al., 1999). Exercise enhanced learning not only through increased neural and vascular proliferation and synaptic function (Sirevaag and Greenough, 1987; Cotman and Berchtold, 2002; Rakic, 2002; van Praag et al., 2005), but also through increased brain-derived neurotrophic factor, a factor necessary for learning and memory (Adlard et al., 2004; Vaynman et al., 2004). In human studies, PA was associated with sustaining the brain's vascular health by lowering blood pressure, improving lipoprotein profile, and promoting endothelial nitric oxide production (Taddei et al., 2000). Exercise provides adequate cerebral perfusion (Rogers et al., 1990), which affects the brain directly by promoting neural fiber, synapses, and capillary expansion (Churchill et al., 2002). Long-term regular PA, including walking, was associated with significantly better cognitive function and less cognitive decline, especially in older women (Yaffe et al., 2001; Weuve et al., 2004). A recent meta-analysis found that combining aerobic training with strength training lasting longer than 30 minutes produced significant positive effects on cognition, particularly on executive function (Colcombe and Kramer, 2003). Other researchers observed that people who received aerobic training had improvements in tasks that require executive control compared with those who received anaerobic training (Kramer et al., 1999).

It is well known that favorable environment and intellectual stimulation throughout childhood and adulthood help preserve intellectual functions in later life (Arbuckle et al., 1998). There is the disuse hypothesis, which suggests that disuse of everyday skills leads to atrophy of the cognitive process (Salthouse, 1991). In dementia, cognitive reserve hypothesis was proposed suggesting that there is capacity beyond what is needed for daily functioning (Katzman, 1993) and that there are individual differences in the ability to tolerate brain pathology (Scarmeas and Stern, 2003; Stern, 2002). Low education is known to increase the risk of AD (Karp et al., 2004). Experimental studies in rats have shown that environmentally enriched conditions have the potential to prevent or reduce cognitive deficits (Pham et al., 1999). There is accumulating evidence concerning brain plasticity in adult life and the existence of angiogenesis, synaptogenesis, and neurogenesis (van Praag et al., 2000; Fillit et al., 2002). PA may enhance non-neuronal components of the brain, such as vasculature, but MA selectively increases synaptogenesis in adulthood (Churchill et al., 2002), and the effects can continue until later life (Pham et al., 2002). In the Nun Study, frequent participation in cognitively stimulating activities was associated with reduced risk of AD (Wilson et al., 2002). Mid- and late-life exposure to enriched or complex environments has beneficial effects on cognition and on the risk for dementia (Verghese et al., 2003; Verghese et al., 2006).

Social relationships also seem to have health-promoting effects (Seeman and Crimmins, 2001), as confirmed by cohort studies supporting social support as a favorable prognostic factor for coronary heart disease (Hemingway and Marmot, 1999; Rosengren et al., 2004). Socially isolated people have a two to four times increased risk of mortality compared with those who are socially active with strong social ties (Bowling and Grundy,

1998; Eng et al., 2002). Sociologists suggested that low SA increases cognitive decline and mortality through five mechanisms (social support, social influence, social engagement, person-to-person contact, and access to resources and material goods) and SA influences different health outcomes through three major pathways: behavioral, psychological, and physiological (Berkman et al., 2000).

In this study, we proposed health concern as a new factor. Health concern exists but its presence and effect on elderly cognition is overlooked compared to the interest in PA, MA, and SA. Health concern reflects one's personal interest or concern for their health. The more interested and concerned a person is in keeping their health, the more they will participate in health promoting activities. The results of this study may suggest that continuous concern will motivate the person to keep on engaging in activities which will eventually promote physical and cognitive health. Encouraging the elderly to have HC and engage in activities will help them keep good cognitive functioning.

The strengths of this study are as follows. First, to the best of our knowledge, no model exists that is similar to the HCA model. Second, as far as we know, there are not many studies looking into all three factors, PA, MA, and SA, and their association with cognition. Third, seeing the influence of health concern on PA, MA, and SA on cognition is a first. Forth, this study divided the subjects into NCI and CI groups to look for different findings.

Our study had the following limitations. First, this is a cross-sectional study; whether good cognitive functioning was an outcome of HC and activity, or vice versa is unclear. A longitudinal study is needed to see the cause and effect of HCA and cognition. Second, the result of this study has restrictions because the K-MMSE is not a comprehensive

tool for examining cognition. A study using a more comprehensive tool may help confirm the results. Third, the subjects who participated in this study were a nonrandom convenience sample cohort. Gwangju is a small rural town in the outskirts of Seoul and they may not be representative of the persons aged more than 60 years in Korea. A selection bias may be present.

V. CONCLUSION

The present study is one of the first to assess health concern and its effect on elderly cognition. We proposed health concern as a new factor and developed HCA model. Our findings show that elderly persons engaged in activities with HC had better cognitive function than those who engage in activities without HC, only have HC, or have no HC or engagement in activities. We categorized the subjects in to NCI and CI groups, the findings were different between the two groups. In the NCI group, subjects with HC while engaging in activities had significantly higher K-MMSE score than all the other subjects. PA, MA, and SA all had a positive effect on cognition. In the CI group, subjects engaging in activities without reference to HC had higher K-MMSE scores than those who were not engaged in activities. Among the three activities only SA had a positive effect on cognition. In the elderly with no cognitive impairments, having HC seems to be a positive factor on cognition when engaged in PA, MA, or SA. In the elderly with cognitive impairment, engaging in activities especially SA seems to be a positive factor for cognition.

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- 국문 요약 -

건강관심행동모델이 노인 인지기능에 미치는 영향

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최근 신체활동, 두뇌활동, 사회활동이 노인의 인지기능에 긍정적인 영향을 미친다는 연구가 활발히 되고 있다. 본 연구는 신체활동, 두뇌활동, 사회활동뿐 아니라 건강에 대한 관심이 노인의 인지기능에 미치는 영향을 살펴보고자 하였다. 경기도 광주 지역에 3157명의 60세 이상 노인을 대상으로 설문조사를 진행하였다. 대상 군을 건강관심행동모델에 따라 4 그룹으로 분류하였다. 건강관심도 없고 행동도 하지 않는 군 (그룹1), 건강관심만 있는 군 (그룹2), 건강관심 없이 행동만 하는 군 (그룹3), 건강에 대한 관심도 있고 행동도 하는 군 (그룹4)로 나누었다. 인지기능은 한국형 간이인지기능검사 (K-MMSE)로 평가하였다. 간이인지기능검사에서 18점을 기준으로 18점 이상을 받은 대상을 인지기능저하가 없는 군 (NCI)으로 분류하였고 17점 이하를 받은 대상은 인지기능 저하 군 (CI)으로 분류하였다. 공분산분석 결과 나이, 성별, 교육, 음주, 흡연을 모두 보정하였을 때 4 그룹간의 유의미한 차이를 확인하였다. 전체 대상자에서 그룹4 간이인지기능검사 점수가 가장 높았으며 다음으로 그룹3, 그룹1, 그룹2 순이었다. 모든 그룹간에 유의미한 차이가 확인되었다. 정상

인지기능을 보이는 군에서 그룹간의 간이인지기능검사 점수차를 살펴 보았을 때 그룹4 인지기능점수가 가장 높았고 그룹1, 2, 3와 유의미한 차이가 나타났으나 그룹 1, 2, 3간에는 유의미한 차이가 확인되지 않았다. 인지기능 저하가 있는 군에서 그룹 4와 3에서 인지기능점수가 높았으며 그룹 1, 2의 것과 유의미하게 차이가 났으나 그룹 4와 3에는 유의미한 차이가 없었다. 다중회귀분석 결과 전체 군에서 신체, 두뇌, 사회 활동이 인지기능에 긍정적인 영향을 미쳤고 정상군에서도 같았다. 하지만 인지기능 저하가 있는 군에서는 사회활동만이 인지기능에 긍정적인 영향을 미쳤다. 신체, 두뇌, 사회 활동을 하는 것과 동시에 건강에 대한 관심을 가지는 것이 노인 인지기능에 긍정적인 영향을 미친다. 특히 인지기능저하가 없는 군에서 그러하다. 인지기능의 저하가 있는 경우 건강관심보다는 행동이 중요하고 그 중에서도 사회활동이 중요하다.

핵심어: 신체활동, 두뇌활동, 사회활동, 건강관심, 한국형 간이인지기능검사