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学位論文題目	Associations between Physical activity, Social interaction, and Cognitive impairment among elderly individuals in China （中国の高齢者における自発的な身体活動及び社会との関わりと認知機能の関連研究）		
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Abstract of thesis

The author performed this study focusing on the association of physical activity and social interaction with cognitive function, she found that physical activity and social interaction is related to cognitive impairment, both of which are protective against cognitive impairment, indicating that engaging older adults in more active physical and social interactions should be considered as an effective approach to prevent cognitive function decline due to aging in China. The abstract of the study is as follows.

(Purpose)

In this study, the author aims at exploring the relationship between cognitive functioning, social interaction and physical activity, in order to discover how physical activity and social interaction are relevant to cognitive function, and more importantly, how these findings can be used to prevent cognitive impairment among the elderly in China.

(Materials and Methods)

The author analyzed the participants selected for the cross-sectional study consisted of 373 individuals aged 60 and over, without clinical evidence of dementia, living in communities of Xuzhou city in China. The author collected the data through interviews, during the time period spanning June to August 2016. The chosen perimeters were assessed using scales. For assessing physical activity, Physical Activity Scale for the Elderly (PASE) was used. For social interaction assessment, Index of Social Interaction (ISI)

was used. Cognitive function was assessed using Mini-Mental State Examination (MMSE). Also, Instrumental activities of Daily Living (IADL) and depression were two other factors examined as well.

(Results)

13.9% of the elderly obtained low scores for MMSE. Results of Chi-square test showed higher total scores for both PASE and ISI at significantly high values related to less cognitive impairment ($p < 0.01$). Furthermore, results show that higher household PASE subscale scores ($p < 0.01$), higher subscales of independence ($p < 0.05$), higher social curiosity ($p < 0.01$) and participation in society ($p < 0.05$) indicate less cognitive impairment ($p < 0.01$). Moreover, multiple logistic analysis revealed that greater household (OR = 0.98, 95% CI: 0.97-0.99) and higher social curiosity (OR = 0.46, 95% CI: 0.31-0.67) inversely relate to cognitive impairment in Chinese elderly.

(Discussion)

The author concludes that Physical activity, such as doing some housework, is related to cognitive maintain in elderly. Previous studies suggested a significant association between housework and cognitive impairment. Housework requires attention, organization and problem solving, which could consequently serve as “cognitive training”, thus, improving cognitive performance ((Iuliano, et al., 2016). Other studies focused on Chinese subjects also mentioned that housework is beneficial for cognitive function (Colette, et al., 1995; Mortimer, et al., 2012). The author thinks that these results support the findings of the current study and imply that doing housework is not a burden but a positive activity for the elderly in China. She also thinks that these results explained that housework requires the ability to plan, organize and remember tasks; thus, it is beneficial for cognitive maintenance (Jiang & Xu, 2014). The author then discusses that excremental study also showed that doing housework gave participants a sense of accomplishment, and that such a gesture was beneficial for cognitive function (Tsuchiya, et al., 2018).

Unlike the results of previous international studies, the author discusses greater leisure and occupational activity does not have a significant positive effect in relation to preventing cognitive impairment. This inconsistency may be explained by the difference in situations of daily living of the elderly (Kesavayuth, et al., 2018; Zhang, et al, 2017). The author found that the the elderly in this study tended to do sit down activities and light sports; only a minority of them were interested in muscle strengthening, strenuous exercise or moderate sports. Moreover, she found that some of the elderly in this study continued with their jobs even after retirement. Considering their work conditions, the author concluded that it is difficult for them to engage with and participate in society.

Most participants in this study experienced a positive social interaction. The author discusses that this finding suggests that while aging is inevitable, social interaction can be maintained by engaging in social environments, and consequently, cognitive decline could be prevented. Previous studies have shown that positive social interaction is related to the prevention of dementia (Hughes, et al., 2010; Bennett 2006). And in this study, social curiosity was founded beneficial for cognitive function. This includes intellectual activities and leisure activities, such as reading and hobbies (Luck, et al., 2014; Hughes, et al., 2010). Based on these, the author discusses that Social curiosity involves not only ways to get information but also mental activity as well as novel intellectual and cognitive stimulations, which have been proven to be effective in reducing the risk of dementia in older adults (Lin, 2007).

A significant association between age and cognitive decline was found in the current study. Recent previous studies have demonstrated that dementia risk increases with aging (Taaffe, D. R. et al., 2018). In

regard to gender, some studies did not find a significant association between gender and dementia risk (Fernández, et al., 2008; Dannhauser, 2014), but others have found a significant association between them (Azad, Bugani & Loy, 2007). The author discusses that this study supports the result that women's risk of cognitive decline is higher than that of men.

Moreover, the study relates that there is a high risk of cognitive impairment amongst Chinese adults. Hence, the author discusses it is highly recommended to explore further preventative methods and conduct future researches for the prevention of dementia.

(Conclusion)

The current study revealed a high potential of cognitive impairment rate amongst Chinese elderly, detailing the relation between physical activity and social interaction with cognitive impairment. These results stipulate that active participation in physical activities and social interactions, especially mundane tasks such as house work, as well as engagement in social curiosity are strong preventive methods to cognitive impairment for Chinese elderly. Finally, the author states that the results of this study indicate that engaging older adults in more active physical and social interactions, such as house work and social curiosity, should be applied into the daily living of the elderly in the family, community, and facility, in order to prevent cognitive function decline.

Abstract of assessment result

(General Comments)

In the current study, the author has revealed that physical activity and social interaction is protective against cognitive impairment in China. Although there are some limitations regarding selection bias, cross-sectional design, lack of the informations on living habit and past occupations in this study, it can provide further evidence for promoting social activities to prevent the decline of cognitive function and offer proof that enhanced participation in social activities can help prevent the decline of cognitive function in China.

(Assessment)

The final examination committee conducted a meeting as a final examination on January 11, 2019. The applicant provided an overview of dissertation, addressed questions and comments raised during Q&A session. All of the committee members reached a final decision that the applicant has passed the final examination.

(Conclusion)

The final examination committee approved that the applicant is qualified to be awarded Doctor of Philosophy in Medical Sciences.