

Association of Physical Activity with Cognitive Function in Older Adults: A Nationwide Cross-Sectional Survey

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INTRODUCTION

As the population ages, cognitive impairment associated with aging, has become the leading cause of health threats among older adults (OAs) [1]. The decline in cognitive function significantly reduces quality of life and daily life functional abilities of individuals, as well as their family members. Recent research [2] revealed that cognitive impairment is preventable since the brain retains plasticity in later life. Moreover, previous studies [1] support the assertion that physical activity (PA) can positively influence the health of older adults and reduce the incidence of Alzheimer's disease associated with aging. In China, there were 200 million OAs aged 60 or above in 2013, which accounted for 15% of China's population. Although several studies have indicated that PA have benefit for not only cognitively healthy but also cognitive impairment among OAs in western culture[3], no studies has investigated the effect of each ADL task on cognitive function focusing on the oldest-old in China.

We examined the internal structure of Chinese Modified Mini-Mental State Examination questionnaire with a total sample of 2848 selected by a nationwide survey. SPSS 20.0 was used for data analysis. The predictive effect of demographic characteristics on respondents' basic ADLs and IADLs was assessed in multiple linear regressions. Also, multiple linear regressions were constructed to determine whether physical activity significantly associated with cognitive function.

In total, 2848 participants completed the whole questionnaires. 1,712 (60.11%) were men and their average age was 80.65 years (standard deviation: 8.55, range: 65-112). Nearly half of these respondents lived in rural areas. Over half of the participants lived with household members. The most common marital status was married and living with spouse, followed with widowed. **Table 1** demonstrates the regression results for scores on the ADL and IADL. The overall model of ADL was significant ($R^2=0.05$, $F(6, 2841)=27.09$, $P=0.000$). Besides, and the overall model of

IADL was also significant ($R^2=0.20$, $F(6, 2841)=115.18$, $P=0.000$). The regression results for MMSE score are shown in **Table 2**. The overall model was significant ($R^2=0.18$, $F(8, 2839)=80.23$, $P=0.000$). Sex, age, co-residence, years of schooling and IADL total score all emerged as significant predictors of MMSE score, while Marital status and ADL total score failed to account for significant variance.

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Table 1. Multiple linear regression for predictors in changes of ADL and IADL scores (N=2848).

	B	SE	β	P-Value
Model				
ADL (Final model adjusted R²=0.05)				
Constant	4.53	0.22		
Sex	0.05	0.04	0.03	0.18
Age at testing	0.02	0.00	0.20	0.00
Co-residence	0.09	0.04	0.04	0.03
Category of residence	-0.13	0.02	-0.10	0.00
Years of schooling	0.01	0.01	0.03	0.10
Marital status	-0.01	0.01	-0.02	0.33
IADL (Final model adjusted R²=0.20)				
Constant	-5.60	0.81		
Sex	0.89	0.15	0.11	0.00
Age at testing	0.18	0.01	0.40	0.00
Co-residence	0.32	0.16	0.04	0.04
Category of residence	-0.28	0.09	-0.05	0.00
Years of schooling	0.02	0.02	0.02	0.38
Marital status	0.07	0.05	0.03	0.18

Table 2. Multiple linear regression for predictors in changes of MMSE score (N=2848).

	B	SE	β	P-Value
Model (final model adjusted R²=0.18)				
Constant	25.88	0.58		
Sex	-0.41	0.09	-0.08	0.00
Age at testing	-0.02	0.01	-0.08	0.00
Co-residence	-0.22	0.10	-0.04	0.03
Category of residence	-0.00	0.06	0.00	1.00
Years of schooling	0.07	0.01	0.12	0.00
Marital status	-0.01	0.03	-0.01	0.79
ADL Total score	0.00	0.05	0.00	0.94
IADL Total score	-0.20	0.01	-0.32	0.00

CONCLUSION

In conclusion, there was significant association between OAs' ability to engage in ADL and IADL and their demographic characteristics, including age, co-residence, and category of residence and gender. In addition, OAs' sex, age, co-residence, years of schooling, and IADL were

significantly predictors of MMSE score. The implication of the present study is of particular relevance when planning intervention for senior individuals, since the IADL may imply the need for additional intervention procedure targeting their specific and basic ADLs to enrich their cognitive function.

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