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Physical Activity Participant: Engagement Toward Cognitive and Physical Function among Rural Veteran's Athletes



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Abstract | Engaging in physical activity is essential for preserving and enhancing cognitive and physical abilities, particularly for rural veteran athletes. Nevertheless, there is a dearth of research documenting the outcomes specifically for this age group. The study aimed to determine the relationship between physical activity, cognitive function, and physical function among rural veteran athletes. A cross-sectional correlational design was used. Data was collected using the Montreal Cognitive Assessment (MoCA), Sports Performance Physical Battery Test – Chair Stand Test (SPPB), Physical Activity Readiness Questionnaire for Everyone (PAR-Q+), and Community Health Activities Model Program for Seniors (CHAMPS). There is a significant moderately positive relationship ($r = 0.460$, $p = 0.009$) between physical activity for all activities and cognitive performance. Physical function showed a non-significant correlation ($r = 0.346$, $p = 0.057$) with physical activity for all activities. In conclusion, rural veteran athletes engage in a substantial amount of physical activity, meeting or exceeding recommended guidelines. There is a positive relationship between physical activity levels and cognitive function, indicating that higher physical activity is associated with better mental health. The relationship between physical activity and physical function is weak, suggesting that while physical activity.

Keywords: *Physical function, cognitive function, physical activity, Montreal Cognitive Assessment (MoCA), Sport Performance Physical Battery Test (SPPB), Community Health Activities Model Program for Seniors (CHAMPS).*

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I. INTRODUCTION

Engagement in physical activity is a crucial aspect of maintaining and improving both cognitive and physical functions, particularly among rural veteran's athletes [4]. The unique challenges faced by this population, including limited access to resources and healthcare facilities, make it essential to understand the specific impact of physical activity on their overall well-being [5]. To address this, it is important to delve deeper into the cognitive and physical benefits that can be gained through regular participation in physical activity, and to explore how these benefits can be maximized for rural veteran's athletes [6]. Physical activity has been demonstrated to have significant effects on cognitive and physical functions, notably among rural veteran athletes [7]. The constraints that this group faces, such as limited resources and access to healthcare facilities, necessitate a thorough understanding of the influence of physical activity on their overall well-being. It is crucial to investigate the mental and physical advantages of engaging in regular physical activity [6]. The primary objective of this research is to investigate the physical activity, cognitive function, and physical function among rural veteran athletes.

Some rural veterans may have physical disabilities or health conditions that limit their ability to be physically active. Despite the barriers, several things can be done to promote physical activity among rural veterans. These include developing and promoting community-based physical activity programs for veterans. Community-based physical activity programs can provide rural veterans with access to facilities and resources, as well as social support for physical activity. Educating rural veterans and their families about the benefits of physical activity can help motivate them to be more physically active. Providing support and encouragement to veterans to be physically active. Providing support and encouragement to rural veterans to be physically active can help them overcome barriers and achieve their physical activity goals. By promoting physical activity among rural veterans, we can help them improve their cognitive and physical function and live long, healthy lives.

II. METHODS

The correlational research design is used to determine if a relationship exists between variables. The sample for this study was among rural veteran's athletes, which was collected using non-probability sampling with an emphasis on purposive sampling. The sampling method was chosen because it has specific criterias which participants were veteran athletes who were 55 years old and older. The sample collected consisted of 31 respondents after considering the expected 20% dropout rate.

Data were collected using the Montreal Cognitive Assessment (MoCA), Sports Performance Physical Battery Test—Chair Stand Test (SPPB), Physical Activity Readiness Questionnaire for Everyone (PAR-Q+), and Community Health Activities Model Program for Seniors (CHAMPS). These include demographic profiles and the Physical Activity Readiness Questionnaire (Par-Q) to capture essential participant information, the Montreal Cognitive Assessment (MOCA) for cognitive function assessment, the Community Healthy Activities Model program for Seniors (CHAMPS) questionnaire to gauge physical activity levels, and the Short Physical Performance Battery, with a particular focus on the physical activity function of the Chair Stand Test.

III. RESULTS AND DISCUSSION

Finding a link between the level of physical activity and cognitive performance in rural veteran athletes is the second research goal. Physical activity, considering all exercise-related activities, showed a high positive connection (0.460, $p < 0.01$) with cognitive function, which is consistent with previous research on the advantages of physical activity for cognitive health. The hypothesis that greater levels of general physical activity are linked to improved cognitive performance is supported by this finding. This result is consistent with findings from past study [1], who found that aerobic exercise training increased hippocampal volume in older adults, which was associated with improved memory function [1].

It is somewhat unexpected that there is only a very modest, non-significant negative connection (-0.004) between physical activity, considering moderate-intensity exercise, and cognitive performance. This finding raises the possibility that moderate-intensity exercise does not significantly affect cognitive performance on its own. This finding contrasts with some existing literature, such as a meta-analysis by Smith et al. [2], which found that aerobic exercise training was associated with modest improvements in attention and processing speed, executive function, and memory. However, it's important to note that our result is specifically about moderate-intensity exercise, while the meta-analysis looked at aerobic exercise more broadly. The difference between the non-significant correlation for moderate-intensity exercise and the strong positive correlation for overall exercise shows that overall physical activity may be more essential for cognitive function than exercise intensity. This aligns with research conducted [3], who found that total volume of physical activity, rather than intensity, was associated with lower mortality in older adults [3]. This study's final goal was to investigate the connection between physical function and physical activity in rural veteran athletes. The study concentrated on two main factors that related to scores on physical function: the number of calories spent on activities related to moderate-intensity exercise and the number of calories burned in all these activities per week. When the length of activities connected to moderate-intensity exercise was examined. This suggests that there is no significant correlation between the duration of moderate-intensity exercise-related activities and Short Physical Performance Battery test scores in this cohort. Despite the moderate link, the absence of statistical significance points to the need for caution in interpretation and for taking other factors that may influence physical function into account. This trend aligns with meta-analyses suggesting a positive impact of physical activity on functional capacity in older adults [2].

TABLE 1
THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND COGNITIVE FUNCTION AMONG RURAL VETERAN'S ATHLETES

Physical activity	Cognitive Function
Kilocalories expenditure/week in all exercise-related activities	0.460**
Kilocalories expenditure/week in moderate-intensity exercise-related all exercise	-0.004

Note: ** $p < 0.01$

TABLE 2
THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND PHYSICAL FUNCTION AMONG RURAL VETERAN’S ATHLETES

Physical Activity	Physical Function
Kilocalories expenditure/week in all exercise-related activities	0.346*
Kilocalories expenditure/week in moderate-intensity exercise-related activities	0.049

Note: * $p < 0.05$

IV. CONCLUSIONS

In conclusion, Rural veteran athletes engage in a substantial amount of physical activity, meeting or exceeding recommended guidelines. There is a positive relationship between physical activity levels and cognitive function, indicating that higher physical activity is associated with better mental health. The relationship between physical activity and physical function is weak, suggesting that while physical activity benefits cognitive health, it does not necessarily ensure high physical function in older age.

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