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RESEARCH ARTICLE

Can Exercise and Self-care Help Manage Stress and Performance?

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ABSTRACT: Stress is a global issue that negatively affects individuals and society. Effective stress management is crucial because it can prevent individuals from experiencing negative health conditions such as depression and anxiety, and detrimental workplace behaviors such as suboptimal performance. As physical and mental well-being are crucial facets of a healthy society, this research emphasizes the importance of developing effective stress-management methods to promote individual well-being and performance. Specifically, this study focuses on exercise and self-care practices and how they can reduce stress, which can further help manage individual performance. By examining the police force, a highly stressful occupation, this study found that individuals who exercised and practiced self-care were more likely to have lower stress, which can help maintain their performance. Furthermore, the findings may guide individuals and organizations in promoting a healthy lifestyle and workplace to prevent stress from escalating and maintain high performance levels.

KEYWORDS: Behavioral and Social Sciences, Stress, Exercise, Physical Care, Task Performance.

Introduction

Stress has become a universal experience, affecting millions of people worldwide. According to the World Health Organization,[1] stress-management is crucial to an individual as it can be a risk factor for major physical or mental problems such as heart disease, depression, and/or anxiety disorders.[2] Over 77% of people experience stress, and it has affected their physical and mental health.[2] Especially, high-stress occupations, where individuals face long hours, tight deadlines, and high expectations, have been leading to both physical and psychological health issues globally. As stress continuously takes a toll on health problems across the world, finding effective ways to mitigate the impact has become the main issue today. The constant pressures of everyday life can often spill over to personal life, leading to growing cycles of stress, making it harder to recover to a stable mental state. With the compiled amounts of stress, individuals may find themselves in an emotionally draining state, which can significantly impact their ability to perform effectively in personal and professional settings. Among the various stress reduction strategies available, methods such as exercise and physical care have the potential to alleviate people's stress levels.

Exercise, particularly physical activities such as aerobic exercises and workouts, has been argued to have positive impacts on mental and physical health. These activities can promote relaxation and balance within the human mind and body while maintaining overall well-being. Numerous studies have shown how regular physical activity can reduce depression, anxiety, and stress levels.[3,4] Engaging exercises such as running, swimming, and cycling trigger the body to release endorphins in the brain to act as mood elevators and natural painkillers. These chemical messengers counteract the negative emotions associated with stress and make the body more resilient to stressors in daily life. Additionally, physical activities themselves allow individuals to focus on the activity itself, which functions as a distraction from external pressures or worries that may be adding to stress. Workouts may also lead to a sense of achievement, which fosters greater self-esteem and confidence. Hence, as further research is conducted to emphasize the importance of exercise and in stress-management, it is significant to explore how these practices can be incorporated into daily life routines.

Furthermore, physical care, such as proper nutrition and hydration, can also be integral in reducing stress effectively.[3] Maintaining a healthy diet and planning self-care practices can improve cognitive function and the wellness of others.[3] From this perspective, the current study can help further understand the relationship between stress and physical care and exercise by examining the responses of police officers in South Korea. Using a profession that is known for its high levels of stress and physical demands, they will be able to examine how exercise and physical care can reduce the negative effects of stress. This particular group will provide insight into identifying effective stress-managing strategies as well as recommendations on structuring a healthy workplace for first responders. Through this research, future programs can be developed to maintain stress levels amongst individuals and organizations on how they can approach personal health and professional performance in the long term.

The impact of stress highlights the importance of finding effective stress-management strategies that can promote the well-being of individuals. Surprisingly, due to the lack of empirical studies, the full extent of how physical care and exercise can reduce stress remains underexplored. Subsequently, this research is crucial to explore the interventions that not only address symptoms of stress but also prevent escalating into chronic conditions. The relationship between exercise and

DOI: 10.36838/v7i8.14

physical care with stress is complex, but investigating the relationships of these factors will help enable us to understand the importance of stress management. Therefore, it can be beneficial to help individuals cope with stress while creating a sustainable lifestyle that will further help individuals perform at high levels.

Hypothesis development

Exercise, as a form of physical activity, is a key component of stress management. Aerobic exercises such as running, dancing, swimming, as well as strength training can be effective in stress reduction. The repetitive movements can promote a sense of ease as they increase an individual's heart rate and breathing, which then stimulate mood elevators by shifting the focus away from stressful thoughts. These forms of exercise produce endorphins, which help alleviate mood and provide a sense of relaxation to improve overall cardiovascular health and negative emotions associated with stress.[5]

Exercise contributes to stress relief through stress inoculation by exposing the body to build resilience over time through increased heart rate and muscle tension.[6] During exercise, heart rates increase, which helps the body learn to manage the physiological responses more efficiently.[6] After the exercise is completed, the body goes into a relaxed state, which can then help an individual's ability to manage stressors in life. Moreover, the mind-body connection is significant in coping with stress. The mind and body are interconnected, which impacts how an individual manages stress. When stress affects the mind, it can influence symptoms such as muscle tension, fatigue, and other physical health problems.[4] Thus, we hypothesize the following:

Hypothesis 1: Exercise will be negatively related to stress.

In concert with the stress-reducing properties of exercise, physical care, particularly through constant attention to nutrition and hydration, assumes a significant role in equipping the body to effectively manage stress. Physical care encompasses practices related to nutrition, hydration, and exercise. It is considered a foundation of mindful self-care because it highlights the connection between physical well-being and mental health.[3] A balanced and nutrient-rich diet provides the body with the essential building blocks required for optimal functioning, particularly when confronted with stress. Nutrition, for instance, consists of eating a variety of nutritious foods as well as maintaining sugar levels, nutrient deficits, and inadequate or excessive energy intake.[3] The body's physiological response to stress requires insufficient nutrient intake and poor dietary habits, which can make stress more difficult to manage. Specifically, low iron intake and/or vitamin D levels increase the vulnerability to stress hormones and neurological functions.[3] Similarly, hydration involves drinking the recommended water intake to have healthy functioning in the body. (1.2 L per day) Dehydration can reduce physical and mental health performance due to fatigue, headache, and decreased concentration.[3]

Nutrition and hydration can reduce stress through several factors. Proper nutrition and hydration provide the human body with vitamins and minerals needed to maintain physiological processes and to respond effectively to stressors. The imbalance of nutritious foods, such as high blood sugar, can impair mood regulation and the stability of emotions.[3] Stress hormones, such as cortisol, are directly involved in regulating stress, and neurotransmitters like serotonin can promote feelings of well-being and happiness.[6] Nutritional support can help manage cortisol and serotonin levels through foods with high sources of tryptophan. The maintenance of a balanced nutritional diet and hydration is displayed through the interactions between stress hormones and neurotransmitters. When the body is in a healthy nutritional state, serotonin can be produced, meaning the body may respond and withstand stress more efficiently. Hence, having a balance of nutrition and hydration is optimal for the body's stress-response systems. Hence, we propose the following:

Hypothesis 2: Physical care will be negatively related to stress.

Stress is a complex concept that can be broadly defined as a psychological and physiological reaction to environmental demands that surpass an individual's ability to cope with the situation.[7] Stress is conceptually distinct from strain. Whereas stress pertains to how individuals respond to external demands, strain refers to the consequences resulting from ongoing stress and the coping resources the person possesses to deal with that stress.[8] Stress encompasses a range of cognitive, emotional, and physical responses, such as anxiety, frustration, and fatigue,[9] leading to biological and psychological changes that can harm overall health and well-being.[10] Stress can arise from the interaction between people and their environment, and be further influenced by their cognitive evaluation and coping abilities.[11] Understanding stress can be further refined through the works of Cohen *et al.*,[12] which suggests that stress emerges when an individual's appraisal of environmental demands outweighs their perceived resources to manage those demands. This view emphasizes the subjective nature of stress, which is influenced by individual values, beliefs, and specific circumstances.

Task performance refers to the execution of job-related duties that contribute directly to an organization's goals. This includes behaviors associated with producing goods, delivering services, and supporting management and technical processes.[13] Borman and Motowidlo[14] explain task performance as the set of behaviors that have a direct relationship with the technical core of the organization, coupled with the formal job requirements mentioned in job descriptions. Task performance, while distinct from contextual performance, which Borman and Motowidlo[14] defined as behaviors contributing to an organization's social and psychological environment, enables the organization to achieve its goals. Consequently, task performance is critical to organizational success because it significantly contributes to not only the psychological and social environment of the organization but also its competitiveness and productivity, thus proving essential for achieving the goals of the organization.[15,16]

Previous research has suggested a negative correlation between stress and task performance at the workplace. The Cognitive Activation Theory of Stress (CATS)[11] proposes that stress disrupts cognitive processes essential for goal-directed

behavior, such as memory, problem-solving, and decision-making. For example, high-stress levels decrease concentration levels, leading to frequent mistakes and reduced productivity in task completion. In addition to cognitive responses, stress may also evoke psychological and emotional responses. According to the Transactional Model of Stress and Coping[11] individuals feel stressed when they perceive an imbalance between the demands placed on them and their ability to cope with them. This perception, in turn, triggers an emotional or psychological reaction, such as anxiety, frustration, or helplessness, which further exacerbates the cognitive disruptions caused by stress. From this perspective, Maglio and Campbell[17] highlighted how task performance can be disrupted by stressors that impair focus and efficiency. Stress-induced annoyance and anxiety, for instance, interrupt workflows and reduce the capacity to meet performance expectations. Similarly, Bailey *et al.*[18] found that stress-related anxiety disrupts task execution, particularly in roles requiring sustained focus and multitasking, we propose the following:

Hypothesis 3: Stress will be negatively related to performance.

Methods

Data were collected using two anonymous questionnaires with Likert-scaled items. The first survey (T1) was given in the first week of November 2024, and the second survey (T2) was given in the first week of December 2024. The study sample consisted of police officers, and the response rate was 87% at T1 (261 were returned out of 300 questionnaires sent out), 89% at T2 (231 returned out of 261 questionnaires sent out), and the final sample size was 214, as unusable cases were discarded. Physical care was measured on 5 items based on Hotchkiss & Cook-Cottone,[19] including "I eat a variety of nutritious foods," "I exercise at least 30-60 minutes," "I take part in sports, dance, or other scheduled physical activities," "I practice yoga or another mind-body practice," and a reverse-scored item, "I do sedentary activities instead of exercising." "I drink at least 6 to 8 cups of water" and "I plan my meals and snacks" were excluded as Hotchkiss and Cook-Cottone[19] found them to either have a low factor loading or an overlap with a different item. Exercise was measured using an open-ended item asking, "How many times do you exercise per week?" Stress was measured on 4 items based on Wartig, Forshaw, South, & White[20] and items included "In the last month, I feel I am unable to control the important things in my life," "I do not feel confident I can handle my personal problems," "I feel that things are not going my way," and "I feel difficulties are piling up so high that I cannot overcome them." Moreover, performance was measured on 4 items based on Van Dyne & Lepine[21] and included the items "I fulfill my responsibilities in my job description," "I perform the tasks that are expected as part of my job," "I meet performance expectations," and "I adequately complete my job responsibilities." Besides the frequency of exercise, all of the scales used a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Results

Table 1: The majority of respondents were male, married, and over 31 years old, with most having 6 or more years of tenure. The most common position was inspector, and most respondents held a bachelor's degree.

Variable		%	Variable		%
Gender	Male	78.5	Tenure	5 years or less	29.8
	Female	21.5		6-10 years	25.8
Marital Staus	Unmarried	30.8		11-15 years	13.0
	Married	69.2		16 years or more	31.4
Age	30 and below	16.8	Position	Constable	9.8
	31-40	40.2		Sergeant	21.0
	41-50	29.3		Inspector	29.0
	50 and above	13.7		Lieutenant	27.6
Education	High school graduate	20.1		Superintendent	11.2
	Bachelor's degree	74.7		Chief superintendent	1.4
	Graduate degree	4.2			
	other	0.0			

Table 1 presents the characteristics of the respondents. The majority of respondents were male (78.5%) and had a bachelor's degree (74.7%). About 40% of the respondents were between the ages of 31 and 40, and 29% were between 41 and 50. The tenure of the respondents ranged from 5 years or less (29.8%) to 16 years or more (31.4%). In terms of position, 29% of the respondents were inspectors, and 27.6% were lieutenants. Over two-thirds of the respondents were married (69.2%).

Table 2 illustrates the means, standard deviations, and correlations for the study. As seen in Table 2, exercise and physical care were found to be negatively correlated to stress and positively correlated to task performance. Stress was found to be negatively correlated with task performance.

Table 2: This table presents the means, standard deviations, and correlations of the study variables.

	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Gender	0.21	0.41	1								
2. Age	39.63	8.69	-0.134	1							
3. Marital status	0.69	0.46	-0.069	0.613**	1						
4. Education	2.57	0.89	0.179**	0.099	0.106	1					
5. Position	3.14	1.21	-0.126	0.761**	0.512**	0.091	1				
6. Tenure	12.56	8.72	-0.125	0.906**	0.543**	0.000	0.817**	1			
7. Exercise	2.32	1.32	-0.155*	-0.021	-0.090	-0.177**	-0.061	-0.006	1		
8. Physical care	3.67	1.35	-0.255**	-0.015	-0.057	-0.122	-0.001	0.033	0.598**	1	
9. Stress	2.86	1.16	0.099	0.033	-0.071	0.167*	0.077	0.026	-0.282**	-0.276**	1
10. Task performance	5.47	0.89	-0.080	0.241**	0.222**	0.019	0.227**	0.237**	0.217**	0.256**	-0.411**

** p < .01.

The hypotheses were tested with SPSS 25 using hierarchical regression analysis. Hypothesis 1 predicted that exercise would have a negative impact on stress. As presented in Table 3, exercise was negatively related to stress ($\beta = -0.148$, $p < 0.05$). Therefore, Hypothesis 1 was supported. Hypothesis 2 proposed that physical care will have a negative effect on stress. As shown in Table 3, physical care was negatively associated with stress ($\beta = -0.143$, $p < 0.05$). Thus, Hypothesis 2 was also supported.

Table 3: The hierarchical regression results showed that exercise and physical care had a significant effect on stress.

Variables	Step 1				Step 2			
	B	Std. Error	Beta	t	B	Std. Error	Beta	t
Gender	0.231	0.196	0.082	1.18	0.049	0.194	0.017	0.251
Age	0.011	0.023	0.079	0.452	0.007	0.023	0.054	0.319
Marital Status	-0.432	0.216	-0.172	-2.003*	-0.499	0.208	-0.199	-2.400*
Education	0.193	0.093	0.148	2.066*	0.154	0.091	0.118	1.698
Position	0.156	0.114	0.163	1.363	0.126	0.110	0.132	1.146
Tenure	-0.010	0.025	-0.075	-0.399	-0.002	0.024	-0.016	-0.089
Exercise					-0.148	0.072	-0.167	-2.038*
Physical care					-0.143	0.071	-0.167	-2.010*
	$R^2 = 0.058$, $F = 2.138$*				$R^2 = 0.141$, $F = 4.191$***			

*p < .05, ***p < .001.

DOI: 10.36838/v7i8.14

Hypothesis 3 predicted that stress would have a negative impact on task performance. In Table 4, stress was found to be negatively related to task performance ($\beta = -0.332$, $p < 0.001$). Therefore, Hypothesis 3 was supported.

Table 4: The hierarchical regression results showed that stress had a significant effect on task performance.

Variables	Step 1				Step 2			
	B	Std. Error	Beta	t	B	Std. Error	Beta	t
Gender	-0.107	0.149	-0.049	-0.715	-0.03	0.135	-0.014	-0.221
Age	0.005	0.018	0.047	0.270	0.008	0.016	0.081	0.518
Marital Status	0.224	0.164	0.116	1.361	0.080	0.150	0.042	0.534
Education	0.005	0.071	0.005	0.069	0.069	0.065	0.069	1.065
Position	0.050	0.087	0.068	0.575	0.102	0.079	0.139	1.291
Tenure	0.007	0.019	0.070	0.377	0.004	0.017	0.038	0.225
Stress					-0.332	0.048	-0.433	-6.960***
	$R^2 = 0.073$, $F = 2.725$*				$R^2 = 0.25$, $F = 9.793$***			

*p < .05, ***p<.001.

We further conducted a bootstrapping test to confirm the mediation effect. The bootstrapping technique was performed with 5000 samples at a 95% confidence interval. The bootstrap results in Table 5 showed that the bootstrapped 95% confidence interval for the indirect effects of exercise on task performance did not contain zero (0.366, 0.1138). Furthermore, the bootstrapped 95% confidence interval for the indirect effect of physical care on task performance did not contain zero (0.342, 0.1083). In sum, stress was found to mediate the relationship between exercise and physical care with task performance.

Table 5: The mediation analysis demonstrated the indirect effect of exercise and physical care on task performance through stress.

Indirect effect on task performance	Effect	BootSE	Bootstrapping Percentile 95 per cent CI	
			Lower	Upper
Exercise	.0708	.0195	.0366	.1138
Physical care	.0681	.0185	.0342	.1083

Discussion

This study aimed to determine the relationships between exercise, physical care, stress, and task performance. Collecting data from police officers in South Korea, the study provides initial insight into how exercise and physical self-care practices can negatively impact stress levels, which then affects individual performance. Given the intense physical demands of police officers, such as exposure to traumatic events and constant public expectations, understanding how physical care and exercise can reduce stress and help police officers not only maintain healthy stress levels and well-being but also perform at high levels.

The data analysis results suggest that exercise and physical care can be quite effective in reducing stress in police officers. The findings of the study align with previous research on how important physical and mental health are in impacting stress levels in humans.[6] Exercise, more specifically aerobic activities, can trigger the release of endorphins, which creates feelings of relaxation throughout the body. This biological response plays a significant role in minimizing the physical effects of stress and helps with preserving homeostasis. Also, physical care practices such as a healthy balance of sleep, nutrition, and hydration can help individuals maintain their stress levels and mental clarity and energy, which allows individuals to perform their duties more effectively while being under pressure. In addition, stress impacts individuals emotionally, which can lead to frustration, anxiety, and depression.[3,19] These emotions can further decrease motivation and affect overall task performance as well. Furthermore, combining exercise and physical care improves job performance and mental health by enhancing cognitive function and boosting mood.

Stress was found to be negatively related to performance. This finding can be explained by the cognitive impact of stress. At the cognitive level, stress interferes with essential functions such as memory, problem-solving, and decision-making. High-stress levels can thus reduce concentration and mental clarity, thereby hindering task efficiency and accuracy. As a result, individuals will be more likely to make mistakes and struggle with productivity when they have higher stress levels. This finding can also be explained by how stress affects individuals emotionally. On an emotional level, stress can elicit feelings such as anxiety, frustration, and helplessness, which further impair task performance. When individuals perceive that the demands placed on them exceed their coping ability, they can become overwhelmed, leading to decreased motivation and efficiency. These emotional responses, in turn, disrupt focus, slow down task completion, making it more difficult to maintain consistent performance levels.

The first potential limitation of this study is that it does not fully account for cultural differences, as the research was conducted in South Korea. Cultural differences may significantly influence perceptions of stress. Prior studies suggest that perceptions of stress, coping mechanisms, and personal control vary across cultures.[22] Therefore, cultural factors may influence the relationship between variables, potentially limiting the applicability of the findings across different cultures among contexts. Future research should explore these relationships within diverse cultural settings to further validate the results. The second limitation is the generalizability of the findings, as the study collected data mainly from male police officers. Perceptions of exercise, physical care, stress levels, and task performance may vary based on gender and occupational background. Further studies should include a more diverse sample, incorporating more females and individuals from various professions to increase the potential for generalization. The third limitation is that exercise was measured using a single item. Therefore, future research employing a multi-item measure capturing frequency, intensity, and type of exercise would enhance construct validity. Finally, individual differences may also play a role in shaping the relationship between the variables. It is well established that differences exist in how individuals deal with stressful encounters,[23] with factors such as personality traits, fitness levels, coping styles, and resilience influencing their responses to stress and engagement in physical activities. Since this study did not fully account for these variations, future research should examine how personal differences can interact with the variables.

Conclusion

In conclusion, the study found that more exercise and self-care practices, such as relaxation and nutritional awareness, can help in reducing stress. Further, as stress can negatively affect

performance, stress management is critical in helping an individual's job performance. Therefore, the study found that stress mediates the relationships between exercise and self-care with performance, which emphasizes the importance of exercise and self-care for individual well-being and job performance.

Acknowledgments

We would like to express our gratitude to Dr. Chung and Dr. Im for their guidance and support in this research. We both took part in the questionnaire development as we searched for the research scales and helped format the questionnaires. Dr. Chung and Dr. Im gave us a tutorial on using SPSS, and after their analysis results, we replicated the results in order to understand how to use the software and to interpret the analysis results.

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DOI: 10.36838/v7i8.14