OPEN ACCESS

Exercise and Quality of Life Journal (2025) 17(1): 71-82
DOI: 10.31382/eqol.250608

ORIGINAL ARTICLE

The impact of exercise habits on quality of life among emergency medicine physicians: A cross-sectional study

Gregory Gibbons[1], Aaron Aslakson[2], Bridget Melton[3], and Helen Bland[3]

[1]Concordia University, River Forest, United States

[2]Crown College, Saint Bonifacius, United States

[3]Georgia Southern University, Statesboro, United States

Received: 25. March 2025 | Accepted: 24. April 2025 | Published: 27. April 2025

Abstract

Physician quality of life is a critical factor influencing overall health, wellness, occupational stress, and burnout. Exercise has been demonstrated to enhance quality of life through multiple mechanisms, positively impacting physical, psychological, and social health domains. The objective of this study was to examine the exercise habits of emergency medicine physicians and their association with quality of life. A quantitative, non-experimental, cross-sectional design was employed to study 103 attending emergency medicine physicians. Participants completed an online questionnaire comprising the International Physical Activity Questionnaire (IPAQ) and the World Health Organization Quality of Life BREF (WHOQOL-BREF) survey to assess physical activity levels and quality of life, respectively. There was no significant difference between compliance with moderate and vigorous physical activity and quality of life across domains. However, strength training compliance was statistically significant ($p = 0.041$) and correlated with improved physical health and quality of life scores. Quality of life among this cohort was slightly elevated in the physical health domain but lower in psychological, social, and environmental health domains compared to population averages. Furthermore, age and the number of hours worked per week were not statistically different in any quality of life domains. Exercise compliance among emergency physicians showed no statistically significant impact on quality of life, except for strength training, which was found to significantly enhance the physical health domain of quality of life.

Keywords: emergency medicine · quality of life · exercise · strength training · physician wellness

Correspondence:
Gregory Gibbons
gmgibbons@gmail.com

Introduction

Physician quality of life (QOL) is increasingly recognized as a critical determinant of healthcare providers' overall health, occupational engagement, and performance. Poor work-life integration and high occupational stress contribute to diminished QOL, heightened burnout risk, and early career attrition in the medical field (Ibrahim et al., 2022; Pulcrano et al., 2016). A well-balanced work-life structure has been shown to predict career satisfaction, positively impacting occupational longevity and enhancing physicians' capacity to engage meaningfully in patient care (Keeton et al., 2007; West et al., 2011). Key demographic factors, including age, gender, and weekly working hours, are associated with variability in QOL outcomes, with younger female physicians identified as particularly vulnerable to poor work-life balance and subsequent burnout (Starmer et al., 2016).

Heavy workloads, limited self-care opportunities, and insufficient time for recreational or leisure activities have been identified as primary contributors to reduced QOL in physicians (Shanafelt et al., 2012). Exercise, which has consistently been shown to positively affect physical, psychological, and social health, may serve as an essential counterbalance to these challenges (Amini et al., 2014; Chou et al., 2018). Research suggests that regular physical activity reduces stress, enhances mental resilience, and contributes to better health outcomes, which, in turn, may mitigate burnout and improve QOL (Taylor et al., 2022). Burnout and QOL have been found to be inversely related: higher levels of burnout are associated with lower QOL, as seen in a study by Colby et al. (2018), which demonstrated that medical students experiencing high burnout also reported significantly lower QOL.

In addition, exercise has shown promise as a specific intervention for enhancing QOL among clinical professionals. Taylor et al. (2022) found that increased physical activity levels were correlated with higher QOL and lower burnout rates, suggesting that exercise could positively impact key markers of clinician wellness. Another study demonstrated that physicians enrolled in an incentivized exercise program had significantly higher QOL scores than those in a control group with similar access to exercise facilities but without structured incentives (Weight et al., 2013). Strength training and aerobic exercise have been shown to improve physical health and provide stress relief, both of which are central to sustaining mental and physical endurance in high-demand fields like medicine (Pucci et al., 2012).

Regular physical activity is widely recognized as a critical determinant of both physical and mental well-being, contributing significantly to enhanced QOL and the reduction of occupational burnout across diverse populations. Numerous studies involving medical students, residents, and general population samples have demonstrated that consistent engagement in exercise is associated with improved psychological resilience, reduced stress levels, and greater overall life satisfaction (Dyrbye et al., 2017; Gerber et al., 2013). Physical activity has been shown to buffer against the negative effects of chronic stress by modulating physiological responses, enhancing mood, and promoting better sleep quality - all factors closely linked to decreased burnout risk and elevated QOL (Mahindru et al., 2023).

Despite this growing body of evidence, there remains a paucity of research specifically examining the relationship between exercise compliance and QOL within the emergency medicine specialty. Emergency physicians operate in a uniquely demanding clinical environment characterized by high patient volumes, time-sensitive decision-making, exposure to traumatic events, and frequent disruptions to circadian rhythms due to irregular shift work (Amini et al., 2014; C. P. West et al., 2018). These occupational hazards contribute to disproportionately high rates of burnout among EM physicians compared to other specialties (Berg, 2023). Lim et al. (2024) emphasize that the combination of long, unpredictable shifts and emotionally charged clinical encounters exacerbates work-life imbalance, leading to detrimental impacts on both personal well-being and professional performance.

Given these distinct stressors, emergency physicians may benefit from tailored wellness strategies that address the unique demands of their practice environment. While physical activity is recognized as a cost-effective and accessible intervention for enhancing mental health and occupational resilience (Bretland & Thorsteinsson, 2015), its specific role in mitigating burnout and improving QOL among EM physicians remains underexplored. Furthermore, adherence to established exercise guidelines, rather than sporadic activity, may be a critical factor in realizing these protective benefits. Understanding the relationship between exercise compliance and domain-specific QOL outcomes in this high-risk population is essential for informing targeted interventions aimed

at promoting sustainable physician well-being and reducing burnout-related attrition within emergency medicine.

The current study investigated the relationship between exercise habits and QOL among emergency medicine physicians, aiming to fill a gap in the literature by focusing on this specialty. Previous research primarily emphasizes medical students, residents, or general populations; thus, there is a need to understand whether compliance with exercise recommendations can influence QOL in practicing emergency medicine physicians.

Using a quantitative, non-experimental, cross-sectional design, this study involved a cohort of emergency medicine attending physicians who completed the International Physical Activity Questionnaire (IPAQ) and the World Health Organization Quality of Life BREF (WHOQOL-BREF) survey. The IPAQ provided data on exercise compliance and intensity, while the WHOQOL-BREF assessed QOL across four domains: physical, psychological, social, and environmental. This approach aligns with recent recommendations for evaluating clinician wellness through comprehensive assessments that incorporate lifestyle habits and mental health markers (Chou et al., 2018).

This study hypothesized that regular exercise, particularly strength training and aerobic activities, would positively correlate with higher QOL scores in emergency physicians, as demonstrated in prior research with other healthcare providers (Weight et al., 2013). Given the intense nature of emergency medicine, establishing an association between exercise compliance and improved QOL could highlight a modifiable factor to help address the high rates of burnout and attrition in this field.

The implications of this research extend beyond emergency medicine. Understanding how exercise impacts physician QOL and burnout across medical specialties can help healthcare institutions develop targeted wellness programs. Findings supporting exercise as a beneficial intervention for QOL enhancement could lead to institutional changes, such as providing on-site fitness facilities, promoting work-life balance, and encouraging regular physical activity as part of organizational wellness strategies. These efforts align with a broader movement in healthcare to prioritize physician well-being, reduce burnout, and foster sustainable career satisfaction (Keeton et al., 2007).

The importance of physician QOL for occupational sustainability, patient care, and overall healthcare system functionality underscores the need for interventions that support clinician wellness. While exercise is widely recognized as a method for improving QOL across various domains, targeted research on its effects within emergency medicine remains limited. This study provides essential insights into how exercise compliance may relate to QOL in emergency physicians, a group particularly prone to burnout due to their unique work demands. Identifying exercise as a modifiable factor for enhancing QOL could inform future wellness initiatives aimed at reducing burnout and improving job satisfaction among emergency medicine professionals and other high-stress medical specialties.

Method

Study design and data collection

This study employed a cross-sectional, survey-based design to investigate the relationship between exercise behaviors and burnout among emergency medicine physicians. In August 2024, a convenience sample of 103 attending emergency physicians was recruited through multiple channels, including email invitations, social media platforms, text messaging, and word-of-mouth referrals. Eligibility criteria included active clinical practice in emergency medicine and willingness to provide informed consent. The study protocol was reviewed and approved by the Institutional Review Board (IRB) of Concordia University Chicago, ensuring adherence to ethical standards for research involving human participants.

Data collection was conducted electronically using the Qualtrics survey platform (Qualtrics, Provo, UT). Participants accessed a secure online questionnaire, which was designed to capture relevant demographic information, occupational characteristics, exercise habits, and burnout levels. Upon completion, survey responses were anonymized and securely exported for statistical analysis.

Measures

Following informed consent, participants provided sociodemographic and occupational data, including age, gender, average weekly working hours, total years in clinical practice, and anticipated remaining years in their current occupational setting. Exercise behavior was assessed through self-reported measures detailing frequency, duration, and type of physical activity, categorized into vigorous activity, moderate activity, and strength training volumes,

consistent with established physical activity guidelines.

All survey data were collected and stored in compliance with data security protocols via Qualtrics. Upon completion of data collection, responses were transferred to IBM SPSS Statistics software (Version 29.0; IBM Corp., Armonk, NY) for cleaning and analysis. Listwise deletion was applied for missing data, and descriptive statistics were computed prior to conducting inferential analyses.

Quality of life

The WHOQOL-BREF is a self-administered questionnaire comprising 26 questions assessing individuals' perceptions of well-being and health over the last two weeks. It covers four domains of wellness: physical health, psychological health, social relationships, and environmental influences. Two additional questions ask about the individual's perception of their overall health and quality of life (Harper et al., 1998; World Health Organization, 1998). The participant responses to questions are recorded on a Likert scale where one represents "disagree" or "not at all" and five means "completely agree" or "extremely." The psychometric properties of the survey have been extensively validated and found reliable in many populations, including healthcare professionals (Harper et al., 1998). The survey is derived from the longer WHOQOL 100-question survey and is most useful in studies that require a briefer evaluation of quality of life, particularly suited for healthcare staff (Gholami et al., 2013). Standard scoring methods in the WHOQOL manual were used to convert the scores into a 0-100 scale. Low quality of life is considered to be scores of 0-45, moderate 46-65, and high quality of life is above 65 (World Health Organization, 1998).

Physical activity

The International Physical Activity Questionnaire (IPAQ) is a short recall survey that helps assess the volume of exercise based on the intensity of the physical activity. It was developed in Geneva in 1998 and later tested extensively for reliability and validity (Craig et al., 2003; Hagströmer et al., 2006). The questionnaire's short form (IPAQ-SF) is widely used to estimate physical activities across varied populations. The IPAQ-SF consists of 7 questions and assesses the number of days and amount of time spent in moderate and vigorous activities and strength training over the last seven days. Individuals who met the standard criteria for physical activity of 150 minutes of moderate-intensity activity weekly or 75 minutes of vigorous activity weekly or strength training twice weekly were considered in compliance with current World Health Organization recommendations for physical activity (Bull et al., 2020).

Statistical analysis

All data was collected and stored electronically through Qualtrics (Qualtrics, Provo, UT) and transferred securely to IBM SPSS Statistics (IBM SPSS Statistics for Mac, Version 29.0. Armonk, NY: IBM Corp) for analysis. Descriptive statistics for all variables were calculated, including mean, median, standard deviation, and frequency. Independent samples t-tests were used to determine if there was a significant difference between exercise compliance groups, quality of life subgroups, and participant demographics. Chi-square analysis was used for dichotomous variables, and Pearson's correlations were used to determine the association between physician demographics and quality of life subgroups. Additionally, using multiple linear regression analyses, the investigation aimed to determine whether adherence to vigorous activity, moderate activity, and strength training guidelines could predict domain-specific QOL outcomes within this high-risk population.

All information was anonymous, confidential, and password-protected.

Results

One hundred and three emergency medicine physicians completed the survey. The response rate is unknown due to the recruiting method used, primarily with social media posts and indirect requests for participation.

Participant demographics

Approximately half (51.5%) of the survey respondents were male, with an average age of 43. Many participants were married (83.5%), 11% were never married, and 3.9% divorced. Nineteen percent of the physicians had practiced less than five years, with the most significant portion (28.2%) practicing 6-10 years and 16.5% having practiced for more than 20 years. Forty-five percent of the physicians worked between 31-40 hours weekly, 36.9% worked less than 30 hours weekly, and 16.7% worked greater than 40 hours per week (Table 1).

Physician quality of life

Quality of life among this cohort of emergency physicians is slightly higher in physical health (76.06 vs. 74.52%) but lower in psychological (67.18 vs.

Table 1. Demographic characteristics of participants

	n	%	M	SD
Gender (*n* = 103)	103	100		
Male	53	51.5		
Female	50	48.5		
Marital Status (*n* = 102)				
Married	86	83.5		
Widowed	1	1.0		
Divorced	4	3.9		
Never married	11	10.7		
Age (years) (*n* = 91)			43.50	7.516
<35	11	10.7		
36-40	27	26.2		
41-45	20	19.4		
46-50	16	15.5		
>51	17	16.5		
Years in practice (*n* = 103)			12.77	7.884
<5	20	19.4		
6-10	29	28.2		
11-15	21	20.4		
16-20	16	15.5		
>20	17	16.5		
Hours worked weekly (*n* = 103)			35.12	11.026
<30	38	36.9		
31-40	47	45.6		
>41	17	16.5		

72.07%), social (66.64 vs. 72.87%), and environmental health (78.73 vs. 79.68%) compared to population means (West et al., 2023). Over three-quarters of physicians rated their QOL in the physical domain to be high (Table 2). Similarly, they also rated their environmental quality of life high, with 87.9% scoring within the upper tier. The lowest score as a group came in psychological QOL (M = 66.24, SD = 18.97), with female physicians fairing slightly worse (M = 64.76, SD = 14.35 vs. M = 69.31, SD = 16.7). The lowest percentage of physicians meeting a high quality of life was in social relationships (57.1%). None of the physician demographic information significantly correlated with the domains of quality of life, including age and number of hours worked weekly (Table 3).

Table 2. Emergency physician quality of life

Quality of Life sub-scores	Total n (%)	Male n (%)	Female n (%)
Physical health	98 (M = 76.06, SD = 13.38)	52 (M = 77.47, SD = 13.81)	46 (M = 74.45, SD = 12.84)
Low	1 (1.2)	0 (0.0)	1 (2.2)
Moderate	23 (23.5)	13 (25)	10 (21.7)
High	74 (75.5)	39 (75)	35 (76.1)
Psychological health	95 (M = 67.18, SD = 15.76)	49 (M = 69.31, SD = 16.7)	46 (M = 64.76, SD = 14.35)
Low	8 (8.4)	4 (8.2)	4 (8.7)
Moderate	32 (33.7)	12 (24.5)	20 (43.5)
High	55 (57.9)	33 (67.3)	32 (69.5)

Table 2 (continued). Emergency physician quality of life

Quality of Life sub-scores	Total n (%)	Male n (%)	Female n (%)
Social Relationships	98 (M = 66.24, SD = 18.97)	52 (M = 67.15, SD = 18.11)	46 (M = 65.21, SD = 20.05)
Low	12 (12.2)	4 (7.7)	8 (17.4)
Moderate	30 (30.1)	18 (34.6)	12 (26.1)
High	56 (57.1)	30 (57.7)	26 (56.5)
Environmental Health	91 (M = 78.73, SD = 13.66)	49 (M = 79.10, SD = 14.61)	42 (M = 78.32, SD = 12.65)
Low	2 (2.2)	1 (2.0)	1 (2.4)
Moderate	9 (9.9)	6 (12.2)	3 (7.1)
High	80 (87.9)	42 (85.7)	38 (90.5)

Table 3. Physician demographics and quality of life correlations

Variable	Physical	Psychological	Social	Environmental	Overall
Gender (m/f)	1.115	1.443	0.501	0.273	-0.315
Age (yrs)	-0.122	0.054	-0.089	-0.118	-0.028
Yrs in practice	0.019	0.173	-0.063	-0.033	0.075
Hours worked weekly	0.091	-0.046	-0.186	-0.071	-0.011
Intent to practice (yrs)	0.019	0.017	0.065	0.032	0.003
Gender (m/f)	0.268	0.115	0.618	0.786	0.754
Age (yrs)	0.262	0.619	0.413	0.278	0.798
Yrs in practice	0.849	0.088	0.535	0.977	0.463
Hours worked weekly	0.376	0.656	0.068	0.491	0.914
Intent to practice (yrs)	0.849	0.869	0.525	0.751	0.973

Note: upper part - coefficients; lower part - significance

Exercise compliance

A total of 29.1% of physicians surveyed were compliant with the current World Health Organization physical activity guidelines. Seventeen percent of physicians complied with moderate exercise recommendations (150 minutes), while 22.3% met the criteria for vigorous physical activity (75 minutes). More physicians (45.6%) met the recommendations for strength training (twice weekly). There were no statistical differences within any participant demographic groups and compliance with moderate and vigorous physical activity or strength training compliance (Table 4).

Exercise compliance and quality of life

There was no statistically significant difference between moderate-intensity physical activity compliance and any domains of quality of life, as reported by this cohort of emergency medicine physicians (Table 5). Similarly, there was no difference between the quality-of-life domains and vigorous-intensity exercise compliance. There was a statistically significant difference between strength training compliance and physical health ($t(101) = 2.073$, $p = .041$). Strength training compliance did not affect the other domains of quality of life.

Multiple linear regression analyses were conducted to examine whether exercise volumes (days x minutes) in vigorous activity, moderate activity, and strength training predict scores across the four domains of quality of life: physical health, psychological health, social relationships, and environmental factors.

The regression model for the Physical Health domain (Table 5) was not statistically significant, $F(3, 74) = 0.71$, $p = 0.550$, with $R^2 = 0.028$. This indicates that only 2.8% of the variance in physical health was explained by exercise volumes. None of the individual predictors were significant (all $p > 0.05$).

Table 4. Emergency physician exercise compliance by demographic

Variable	Moderate Exercise n (%)	Vigorous Exercise n (%)	Strength Training n (%)
Total	18 (17.0)	23 (22.3)	47 (45.6)
Gender (n=103)	$\chi^2 = 3.765$, p = 0.052	$\chi^2 = 0.304$, p = 0.581	$\chi^2 = 1.242$, p = 0.265
Male	13 (24.5)	13 (24.5)	27 (50.9)
Female	5 (10.0)	10 (20)	20 (40.0)
Age (n=91)	t = -0.996, p = 0.861	t = -0.221, p = 0.262	t = 1.062, p = 0.127
<35	0 (0.0)	1 (9.1)	5 (45.5)
36-40	6 (22.2)	5 (18.5)	14 (51.9)
41-45	3 (15.0)	6 (30.0)	11 (55.0)
46-50	1 (6.3)	3 (18.8)	7 (43.8)
>51	5 (29.4)	4 (23.5)	6 (35.3)
Total	15 (14.6)	19 (18.4)	43 (41.7)
Years in practice (n=103)	t = -1.496, p = 0.067	t = -0.399, p = 0.295	t = 0.367, p = 0.565
<5	0 (0.0)	1 (9.1)	5 (45.5)
6-10	6 (22.2)	5 (18.5)	14 (51.8)
11-15	3 (15.0)	6 (30.0)	11 (55.0)
16-20	1 (6.3)	3 (18.8)	7 (43.8)
>20	5 (29.4)	4 (23.5)	6 (35.3)
Hours worked weekly (n=103)	t = -0.537, p = 0.347	t = -0.413, p = 0.884	t = 0.782, p = 0.210
<30	7 (18.4)	9 (23.7)	20 (52.6)
31-40	8 (17.0)	10 (21.3)	21 (44.7)
>41	3 (17.6)	4 (23.5)	5 (29.4)

Table 5. Correlations of exercise compliance and quality of life domains

Variable	Moderate-Intensity Exercise	Vigorous-Intensity Exercise	Strength Training
Physical	1.163	1.864	2.073
Psychological	1.442	1.567	1.648
Social	0.580	0.427	0.026
Environmental	1.595	1.038	0.753
Overall	0.697	0.756	0.091
Physical	0.248	0.065	0.041*
Psychological	0.153	0.120	0.103
Social	0.563	0.663	0.979
Environmental	0.114	0.302	0.453
Overall	0.487	0.451	0.928

Note: upper part - coefficients; lower part - significance

The model was also non-significant in the Psychological Health domain (Table 6), F (3, 74) = 1.46, p = 0.234, with $R^2 = 0.056$. Although strength training volume showed a positive association ($\beta = 0.195$, p = 0.112), it did not reach statistical significance.

The regression analysis for the Social Relationships domain (Table 7) revealed no significant predictive value, F (3, 74) = 0.21, p = 0.892, with $R^2 = 0.008$. All predictors demonstrated non-significant relationships with social quality of life scores.

Regarding the Environmental domain (Table 8), the regression model was again non-significant, F (3, 74) = 0.76, p = 0.522, with $R^2 = 0.030$. No individual exercise volume variables significantly

predicted environmental quality of life scores (Table 9).

Across all four domains of quality of life, volumes of vigorous activity, moderate activity, and strength training were not significant predictors. However, a positive trend was observed between strength training volume and psychological health, suggesting potential relevance for future research with larger sample sizes or alternative study designs.

Table 6. Multiple regression analysis predicting physical health domain from exercise volumes

Predictor	B	SE	β	t	p
(Constant)	75.08	2.08	-	36.11	<0.001
Vigorous Volume	0.007	0.015	0.06	0.47	0.644
Moderate Volume	0.007	0.017	0.05	0.42	0.679
Strength Volume	0.020	0.022	0.11	0.90	0.371

Model Summary: R = 0.167, R^2 = 0.028, Adjusted R^2 = -0.011
ANOVA: F (3, 74) = 0.71, p = 0.550

Table 7. Multiple regression analysis predicting psychological health domain from exercise volumes

Predictor	B	SE	β	t	p
(Constant)	65.21	2.54	-	25.69	<0.001
Vigorous Volume	0.012	0.018	0.09	0.69	0.494
Moderate Volume	0.000	0.021	-0.00	-0.02	0.988
Strength Volume	0.043	0.026	0.20	1.61	0.112

Model Summary: R = 0.236, R^2 = 0.056, Adjusted R^2 = 0.017
ANOVA: F (3, 74) = 1.46, p = 0.234

Table 8. Multiple regression analysis predicting social relationships domain from exercise volumes

Predictor	B	SE	β	t	p
(Constant)	64.96	3.10	-	20.94	<0.001
Vigorous Volume	-0.003	0.022	-0.02	-0.13	0.894
Moderate Volume	0.010	0.026	0.05	0.37	0.710
Strength Volume	0.019	0.032	0.07	0.58	0.566

Model Summary: R = 0.091, R^2 = 0.008, Adjusted R^2 = -0.032
ANOVA: F (3, 74) = 0.21, p = 0.892

Table 9. Multiple regression analysis predicting environmental domain from exercise volumes

Predictor	B	SE	β	t	p
(Constant)	78.31	2.16	-	36.19	<0.001
Vigorous Volume	-0.013	0.015	-0.10	-0.81	0.418
Moderate Volume	0.021	0.018	0.15	1.19	0.240
Strength Volume	0.015	0.023	0.08	0.65	0.520

Model Summary: R = 0.173, R^2 = 0.030, Adjusted R^2 = -0.010
ANOVA: F (3, 74) = 0.76, p = 0.522

Discussion

In this cohort of emergency medicine physicians (n = 103), overall exercise compliance rates were low, with only 29.1% meeting the recommended physical activity guidelines. This rate aligns with previously reported exercise compliance levels among attending physicians (Michas, 2023; Williams et al., 2015) and is marginally higher than the general population's average of 24.2% (Elgaddal et al., 2022). Strength training compliance was notably higher at 45.6%, surpassing the 29% compliance rate in the general population (Abildso, 2023) and slightly exceeding the 41% compliance rate among multi-specialty physicians (Abramson et al., 2000). No previously identified studies specifically address exercise compliance in emergency medicine physicians, highlighting the potential need for more focused research in this high-stress specialty group.

Prior research has consistently indicated a positive relationship between exercise and enhanced quality of life across various domains, including physical and psychological health (Colby et al., 2018; Pucci et al., 2012; Taylor et al., 2022; Weight et al., 2013). However, in contrast, the present study did not find a significant association between compliance with moderate or vigorous physical activity and quality of life. A statistically significant association was observed only with strength training compliance, which positively impacted the physical health domain ($p = .041$). This finding aligns with the documented effects of strength training on physical health and functional ability in adult populations (Hart & Buck, 2019). Furthermore, strength training and general exercise compliance did not significantly influence emergency physicians' overall perception of quality of life.

The findings of this study indicate that self-reported volumes of vigorous activity, moderate activity, and strength training were not significant predictors of quality of life (QOL) across the physical, psychological, social, and environmental domains among emergency medicine physicians. While prior research has consistently linked regular physical activity to enhanced well-being and reduced burnout in healthcare professionals and general populations (Dyrbye et al., 2017; Gerber et al., 2014), the present analysis did not demonstrate statistically significant associations within this cohort. Notably, a positive trend was observed between strength training volume and psychological health, suggesting that certain forms of exercise may offer domain-specific benefits. However, this relationship did not reach conventional significance levels ($p = 0.112$).

These results highlight the complexity of factors influencing QOL in emergency physicians, a group exposed to unique occupational stressors that may attenuate the protective effects of physical activity alone (Amini et al., 2014; West et al., 2018). It is possible that while exercise contributes to overall well-being, its impact may be moderated by variables such as sleep disruption, workload intensity, emotional burden, and institutional support systems, which were not directly assessed in this study.

No significant associations were found between age, weekly working hours, and quality of life in this cohort. Notably, only 16.5% of participants reported working more than 40 hours per week, suggesting that work-hour overload may not play as substantial a role in quality of life or exercise compliance among these emergency physicians as might be anticipated. Despite these relatively moderate work hours, the low exercise compliance rates suggest that factors beyond time availability - such as motivation, perceived benefit, and personal attitudes toward exercise - may influence exercise behaviors among emergency medicine physicians.

Overall, the quality of life for this cohort was slightly elevated in the physical health domain relative to population norms but lower in psychological, social, and environmental health domains (West et al., 2023). Notably, over 75% of physicians rated their physical quality of life as high, potentially masking any additional benefits that exercise might confer in this area. While weak, non-significant associations were observed in domains where physicians reported lower quality of life - such as the psychological domain - the study's sample size may have limited the statistical power needed to detect subtle effects in these areas.

Limitations

The study's limitations should be acknowledged. First, the cohort was limited to emergency physicians, restricting generalizability across other medical specialties and non-medical occupations. The reliance on self-reported survey data introduces potential recall bias, as participants estimated their exercise volume rather than using objective measures. Social desirability bias may have led physicians to over-report exercise compliance. Additionally, exercise and quality of life surveys were administered randomly, potentially affected by seasonal variations in patient volumes and acuity, which might influence levels of occupational stress and responsibilities. The cultural stigma around mental health reporting within the medical profession may have further influenced the accuracy of self-reported emotional and mental health issues due to concerns over potential professional repercussions.

While the findings of this study did not demonstrate a broad association between exercise compliance and overall quality of life among emergency physicians, the significant association between strength training compliance and physical health warrants attention. Given that strength training was the only form of exercise to show a statistically significant benefit, it may offer a targeted intervention for emergency physicians seeking to improve physical well-being. This could be incorporated into wellness programs designed to mitigate the physical demands of emergency medicine, an area that traditionally sees high rates of musculoskeletal stress and injury due to the

physically intensive nature of the work (Amini et al., 2014). Furthermore, healthcare organizations might consider promoting strength training as a viable option within institutional wellness programs, possibly providing resources such as on-site fitness facilities or discounts at local gyms to encourage participation.

Future Research

Future studies should adopt a longitudinal approach to assess how sustained exercise habits impact quality of life across different career and life phases, providing a more nuanced understanding of the long-term effects of physical activity on physician wellness. Incorporating objective exercise tracking tools, such as wearable devices, could improve data reliability by reducing recall bias. Additionally, studies should investigate various exercise intensities, modalities, and frequencies to determine which forms and amounts of exercise are most effective for enhancing the quality of life in emergency physicians. Expanding this research across other medical specialties would improve the generalizability of findings and reveal whether the trends observed among emergency physicians hold for other healthcare providers. Little is currently known about the barriers to exercise compliance in this demographic, suggesting a need for research on obstacles to exercise and strategies to improve physician wellness behaviors.

Conclusion

This study, involving 103 practicing emergency medicine physicians, found no significant association between compliance with moderate and vigorous exercise and quality of life as measured by the WHOQOL-BREF. However, a statistically significant association was identified between strength training compliance and the physical health domain of quality of life. This suggests that strength training may offer a targeted means to improve physical well-being in this group. Despite the unpredictable and demanding work environment of emergency medicine, the cohort reported a generally high quality of life, particularly in the physical health domain. However, low exercise compliance rates persisted, even though over 80% of the cohort reported working 40 hours per week or less. Neither age nor weekly hours worked correlated significantly with quality of life in any domain.

The findings indicate that while overall exercise compliance may not strongly relate to quality of life, strength training may positively influence physical health, providing potential benefits for emergency physicians' wellness. Future research should continue exploring the role of exercise in quality of life, with an emphasis on more comprehensive data collection and prospective interventional studies to understand how exercise might contribute to career longevity and physician well-being.

References

Abildso, C. G. (2023). Prevalence of meeting aerobic, muscle-strengthening, and combined physical activity guidelines during leisure time among adults, by rural-urban classification and region - United States, 2020. *MMWR. Morbidity and Mortality Weekly Report*, *72*(4). https://doi.org/10.15585/mmwr.mm7204a1

Abramson, S., Stein, J., Schaufele, M., Frates, E., & Rogan, S. (2000). Personal exercise habits and counseling practices of primary care physicians: A national survey. *Clinical Journal of Sport Medicine*, *10*(1), 40.

Amini, A., Munesan, M. R., Dolatabadi, A. A., Kariman, H., Hatamabadi, H. R., Shahrami, A., & Shojaee, M. (2014). Quality of life in emergency medicine specialists of teaching hospitals. *Emergency*, *2*(3), Article 3. https://doi.org/10.22037/emergency.v2i3.5999

Berg, S. (2023, August 29). *These 6 physician specialties have the most burnout*. American Medical Association. https://www.ama-assn.org/practice-management/physician-health/these-6-physician-specialties-have-most-burnout

Bretland, R. J., & Thorsteinsson, E. B. (2015). Reducing workplace burnout: The relative benefits of cardiovascular and resistance exercise. *PeerJ*, *3*, e891. https://doi.org/10.7717/peerj.891

Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.-P., Chastin, S., Chou, R., Dempsey, P. C., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C. M., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P. T., … Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, *54*(24), 1451–1462. https://doi.org/10.1136/bjsports-2020-102955

Chou, J., Poonja, Z., Innes, M., Lin, M., Chan, T. M., Azan, B., & Thoma, B. (2018). How I stay healthy in emergency medicine: A qualitative analysis of a blog-based survey of expert emergency physicians and their methods to maintain and improve their wellness. *Canadian Journal of Emergency Medicine*, *20*(S1), S21–S21. https://doi.org/10.1017/cem.2018.104

Colby, L., Mareka, M., Pillay, S., Sallie, F., van Staden, C., du Plessis, E. D., & Joubert, G. (2018). The association between the levels of burnout and quality of life among fourth-year medical students at the University of the Free State. *South African Journal of Psychiatry*, *24*(1), 1–6. https://doi.org/10.4102/sajpsychiatry.v24i0.1101

Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., & Sallis, J. F. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & Science in Sports & Exercise*, *35*(8), 1381–1395. https://doi.org/10.1249/01.MSS.0000078924.61453.FB\

Dyrbye, L. N., Satele, D., & Shanafelt, T. D. (2017). Healthy exercise habits are associated with lower risk of burnout and higher quality of life among U.S. medical students. *Academic Medicine*, *92*(7), 1006–1011. https://doi.org/10.1097/ACM.0000000000001540

Elgaddal, N., Kramarow, E., & Ruben, C. (2022). Physical activity among adults aged 18 and over: United States, 2020. *NCHS Data Brief*, *443*. https://doi.org/10.15620/cdc:120213

Gerber, M., Lindwall, M., Lindegård, A., Börjesson, M., & Jonsdottir, I. H. (2013). Cardiorespiratory fitness protects against stress-related symptoms of burnout and depression. *Patient Education and Counseling*, *93*(1), 146–152. https://doi.org/10.1016/j.pec.2013.03.021

Gholami, A., Jahromi, L. M., Zarei, E., & Dehghan, A. (2013). Application of WHOQOL - BREF in measuring quality of life in health-care staff. *International Journal of Preventive Medicine*, *4*(7), 809–817.

Hagströmer, M., Oja, P., & Sjöström, M. (2006). The International Physical Activity Questionnaire (IPAQ): A study of concurrent and construct validity. *Public Health Nutrition*, *9*(6), 755–762. https://doi.org/10.1079/PHN2005898

Harper, A., Power, M., & WHOQOL Group. (1998). Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. *Psychological Medicine*, *28*(3), 551–558. https://doi.org/10.1017/S0033291798006667

Hart, P. D., & Buck, D. J. (2019). The effect of resistance training on health-related quality of life in older adults: Systematic review and meta-analysis. *Health Promotion Perspectives*, *9*(1), 1–12. https://doi.org/10.15171/hpp.2019.01

Ibrahim, B. A., Mostafa, M., & Hussein, S. M. (2022). Professional quality of life among physicians of tertiary care hospitals: An Egyptian cross-sectional study. *Journal of Public Health Research*, *11*(2). https://doi.org/10.4081/jphr.2021.2436

Keeton, K., Fenner, D. E., Johnson, T. R. B., & Hayward, R. A. (2007). Predictors of physician career satisfaction, work–life balance, and burnout. *Obstetrics & Gynecology*, *109*(4), 949. https://doi.org/10.1097/01.AOG.0000258299.45979.37

Lim, R., Alvarez, A., Cameron, B., & Gray, S. (2024). Breaking point: The hidden crisis of emergency physician burnout. *Canadian Journal of Emergency Medicine*. https://doi.org/10.1007/s43678-024-00659-7

Mahindru, A., Patil, P., & Agrawal, V. (2023). Role of physical activity on mental health and well-being: A review. *Cureus*, *15*(1).

Michas, F. (2023). *Physicians' exercise habits U.S. 2020*. Statista. https://www.statista.com/statistics/1089600/physician-exercise-habits-us/

Pucci, G., Reis, R. S., Rech, C. R., & Hallal, P. C. (2012). Quality of life and physical activity among adults: Population-based study in Brazilian adults. *Quality of Life Research*, *21*(9), 1537–1543. https://doi.org/10.1007/s11136-011-0083-5

Pulcrano, M., Evans, S. R. T., & Sosin, M. (2016). Quality of life and burnout rates across surgical specialties: A systematic review. *JAMA Surgery*, *151*(10), 970–978. https://doi.org/10.1001/jamasurg.2016.1647

Shanafelt, T. D., Boone, S., Tan, L., Dyrbye, L. N., Sotile, W., Satele, D., West, C. P., Sloan, J., & Oreskovich, M. R. (2012). Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Archives of Internal Medicine*, *172*(18), 1377–1385. https://doi.org/10.1001/archinternmed.2012.3199

Starmer, A. J., Frintner, M. P., & Freed, G. L. (2016). Work–life balance, burnout, and satisfaction of early career pediatricians. *Pediatrics*, *137*(4), e20153183. https://doi.org/10.1542/peds.2015-3183

Taylor, C. E., Scott, E. J., & Owen, K. (2022). Physical activity, burnout and quality of life in medical students: A systematic review. *The Clinical Teacher*, *19*(6), e13525. https://doi.org/10.1111/tct.13525

Weight, C. J., Sellon, J. L., Lessard-Anderson, C. R., Shanafelt, T. D., Olsen, K. D., & Laskowski, E. R. (2013). Physical activity, quality of life, and burnout among physician trainees: The effect of a team-based, incentivized exercise program. *Mayo Clinic Proceedings*, *88*(12), 1435–1442. https://doi.org/10.1016/j.mayocp.2013.09.010

West, C. P., Dyrbye, L. N., & Shanafelt, T. D. (2018). Physician burnout: Contributors, consequences and solutions. *Journal of Internal Medicine*, *283*(6), 516–529. https://doi.org/10.1111/joim.12752

West, C. P., Shanafelt, T. D., & Kolars, J. C. (2011). Quality of life, burnout, educational debt, and medical knowledge among internal medicine residents. *JAMA*, *306*(9), 952–960. https://doi.org/10.1001/jama.2011.1247

West, E. C., Williams, L. J., Stuart, A. L., & Pasco, J. A. (2023). Quality of life in south-eastern Australia: Normative values for the WHOQOL-BREF in a population-based sample of adults. *BMJ Open*, *13*(12), e073556. https://doi.org/10.1136/bmjopen-2023-073556

Williams, A. S., Williams, C. D., Cronk, N. J., Kruse, R. L., Ringdahl, E. N., & Koopman, R. J. (2015). Understanding the exercise habits of residents and attending physicians. *Family Medicine*, *47*(2), 118–123.

World Health Organization. (1998). *Programme on mental health: WHOQOL user manual*. World Health Organization.


FACULTY OF SPORT AND PHYSICAL EDUCATION
NOVI SAD