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Original Research Article

Correlation of musculoskeletal fitness and quality of life with perceived stress among practicing lawyers: a cross-sectional study

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ABSTRACT

Background: Lawyers' quality of life has been shown to be negatively impacted by stress in the legal profession. Lawyers are more likely to endure psychological distress than the general population. To determine the correlation between musculoskeletal fitness and perceived stress and to compare quality of life across different levels of perceived stress among practicing lawyers.

Methods: A cross-sectional correlational study was conducted among 76 practicing lawyers aged 30–60 years with a minimum of 5 years of professional experience. Perceived stress was assessed using the Perceived Stress Scale (PSS-10), quality of life using the WHOQOL-BREF and musculoskeletal fitness using seated push-up and timed stand tests for muscular strength, arm curl and 1-minute step tests for muscular endurance and Apley's back scratch and weight-bearing lunge tests for flexibility.

Results: No statistically significant correlation was detected between perceived stress and any components of musculoskeletal fitness ($p>0.05$). Participants with low perceived stress exhibited considerably greater quality of life scores than those experiencing moderate stress across all WHOQOL-BREF domains including physical health (83.44±10.45 vs. 68.69±14.40; $p<0.001$), psychological health (81.18±11.94 vs. 69.15±15.15; $p<0.001$), social relationships (81.06±12.10 vs. 71.66±12.87; $p=0.023$) and environmental health (77.46±16.63 vs. 62.78±15.73; $p<0.001$).

Conclusions: Perceived stress was not significantly associated with musculoskeletal fitness but was significantly associated with all four WHOQOL-BREF domains. Lawyers with lower perceived stress reported better quality of life.

Keywords: Lawyers, Musculoskeletal fitness, Physical fitness, Quality of life, Stress

INTRODUCTION

Physical fitness is the ability to perform daily tasks with vigour and alertness, without undue fatigue and with enough energy to enjoy leisure-time pursuits and meet unforeseen emergencies.[1] It is an important determinant of functional capacity, health and overall, wellbeing. Health-related physical fitness includes cardiorespiratory endurance, body composition, muscular strength, muscular endurance and flexibility, whereas skill-related fitness includes components such as agility, balance, coordination and power. Being physically active is linked to one's capacity to work efficiently, enjoy free time, stay well, withstand hypokinetic illnesses and handle emergencies.[2] Enhancements in physical fitness, particularly cardiovascular endurance, are often correlated with better health or a lower risk of disease.[3] Regular physical activity and maintenance of physical fitness are associated with improved health and reduced risk of several chronic health conditions.[1,4] Musculoskeletal fitness (MSF), is an important component of health-related physical fitness and encompasses the ability of the

musculoskeletal system to generate and sustain force. It primarily includes muscular strength, endurance and flexibility.[5] The maximum force that a muscle or muscle group can produce at a specific speed is referred to as muscular strength (dynamic). The capacity of a muscle or muscle group to repeatedly contract against a load for a prolonged period of time is known as muscular endurance. Flexibility refers to the available range of movement around a joint and may include both static and dynamic aspects. Adequate musculoskeletal fitness is associated with physical functioning health and quality of life, while improvements in strength, endurance and flexibility through physical activity and exercise may contribute to better overall well-being.[6]

Stress is a complex concept that has been described as a stimulus, a response to a stimulus or the physiological consequences of that response.[7] It may arise from a wide range of social, personal and occupational circumstances and does not necessarily produce adverse consequences in all situations. However, prolonged or excessive stress may challenge physiological and psychological homeostasis and activate adaptative affective, physiological, biochemical and behavioural responses. People frequently use the term "stress" in a range of social, intellectual and professional contexts.[8,9] Stress has been related to every major cause of death, including heart disease, cancer, lung conditions, vehicular accidents, cirrhosis and suicide. According to some health professionals, stress may account for 70% to 85% of all diseases and illnesses.[10] Quality of life is a multidimensional and subjective construct that reflects individual's perception of their physical health, psychological well-being, social relationships and environmental circumstances. Because QOL is a subjective assessment from the individual's perceptive, it is considered important.[11] Review research found that moderate and regular physical activity had a significant impact on quality of life.[12] When there is no cure for a chronic illness, measuring quality of life (QOL) offers a useful method to assess the impact of medical treatment.[13]

The legal profession involves intellectually demanding work, regular client interactions and opposing parties, detailed examination of legal matters and substantial professional responsibility. Lawyers may experience long working hours, heavy workloads, time constraints, hight level of accountability, client expectations, emotional demands and difficulty in maintaining work-life balance.[14] These occupational demands may contribute to psychological demands and adversely influence physical and psychological well-being.[15] Previous literatures have reported increased psychological distress among lawyers and have identified occupational stressors that may affect their health, professional functioning and quality of life.[16] Inadequate coping with occupational stress may also be associated with sleep disturbances, relationship difficulties and unhealthy coping behaviours.[16] In many circumstances, there may not be appropriate coping strategies. Lawyers who are stressed at work, for example, may use alcohol and substance use as a coping mechanism and have sleep issues and relationship problems as well.[17]

The relationship between physical fitness and psychological well-being is important because regular activity and adequate physical fitness may provide protective effects against stress and its associated health consequences. However, despite the occupational demands experienced by legal professionals, the relationship between musculoskeletal fitness, perceived stress and quality of life among practicing lawyers remains insufficiently explored, particularly in the Indian context. Understanding these relationships may help identify areas that can be addressed through workplace health promotion and physiotherapy-based wellness strategies. Therefore, the purpose of this study is to examine the connection between lawyers' physical fitness, stress levels and quality of life in order to emphasise the significance of fitness in promoting the wellbeing and productivity of legal professionals.

Need of the study

Stress is becoming a serious public health concern, affecting millions of individuals across the globe. Stress negatively impacts physical fitness by increasing the cortisol levels which hinders muscle recovery, fitness performance and progress. Lawyers' physical and mental health can suffer significantly as a result of the high levels of stress, long hours at work and largely sedentary work habits associated with the legal profession. Physical fitness is often overlooked despite being an essential component of total well-being because of hectic schedules and work-related demands. Fatigue, worry, burnout and chronic lifestyle-related diseases are only a few of the health issues that might arise from this imbalance, which would ultimately lower one's productivity at work and quality of life. Despite the fact that many studies have looked at stress and mental health in high-pressure industries, there is a significant study void regarding the association between physical fitness and quality of life, especially for lawyers.

Aims

The aim of the study is to find out the relationship between musculoskeletal fitness and quality of life with Perceived stress among Practicing Lawyers

Objectives

Primary

To determine the association of musculoskeletal fitness levels and quality of life among Practicing Lawyers

Secondary

To compare the quality of life across different levels of perceived stress among practicing lawyers.

METHODS

A cross-sectional correlational study was conducted over 3 months among 76 practicing lawyers in Bengaluru. Participants were licensed lawyers aged 30–60 years with ≥5 years of professional experience, attending the City Civil Court or High Court at least three times per week. Participants with physical disabilities or chronic illnesses affecting fitness assessment, psychiatric disorders under treatment or pregnancy/postpartum status within 6 months were excluded.

Ethical approval was obtained from the Institutional Ethics Committee of RV College of Physiotherapy and informed consent was obtained from all participants.

Data were collected using Google Forms and standardized physical fitness tests. Perceived stress was assessed using the Perceived Stress Scale (PSS-10), quality of life using the WHOQOL-BREF and musculoskeletal fitness using Apley's back scratch, seated push-up, 30-second sit-to-stand, weight-bearing lunge, 1-minute step and arm curl tests.

Sample size

A study conducted by Feng-Jen Tsai reported that 60% of lawyers experienced occupational stress almost always or often. Taking this proportion as a reference, with a 95% confidence level and an absolute precision of 11%, the estimated sample size was 76.

Sample size calculation (for a single proportion):

$N=(Z_{(1-\alpha/2)}^2)/l^2 \times P \times (1-P)$

Confidence level=95%, $Z(1-\propto/2) = 1.96$

P=60%

l =11%

RESULTS

After obtaining approval from the Institutional Ethics Committee of RV College of Physiotherapy, eligible participants were screened according to the inclusion and exclusion criteria. Written informed consent was obtained and demographic details were recorded. The assessment was conducted in three sections: perceived stress, musculoskeletal fitness and quality of life.

Perceived stress

Perceived stress was assessed using the 10-item Perceived Stress Scale (PSS-10), administered through Google Forms. Each item was scored from 0 to 4, with total scores categorized as low (0–13), moderate (14–26) and high (27–40) stress.[18]

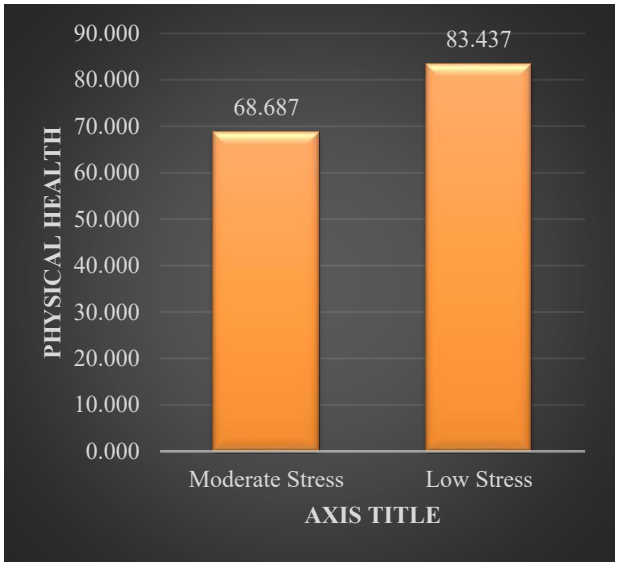


Figure 1: Physical health and stress.

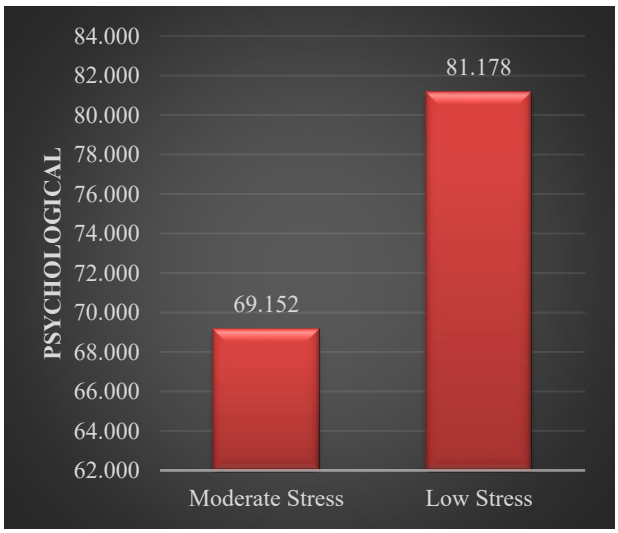


Figure 2: Psychological health and stress.

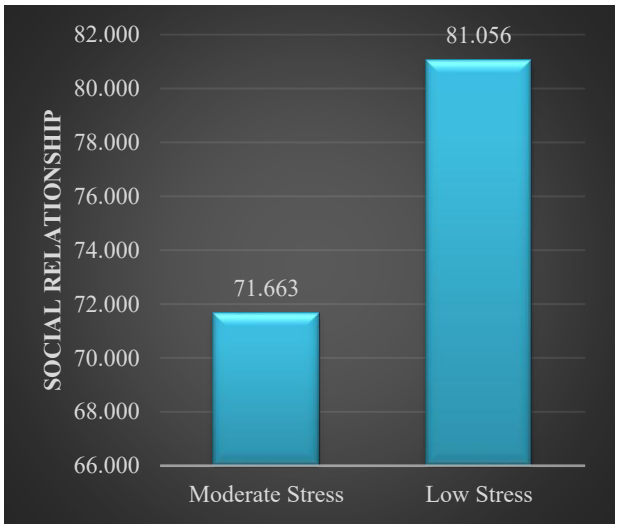


Figure 3: Social relationship and stress.

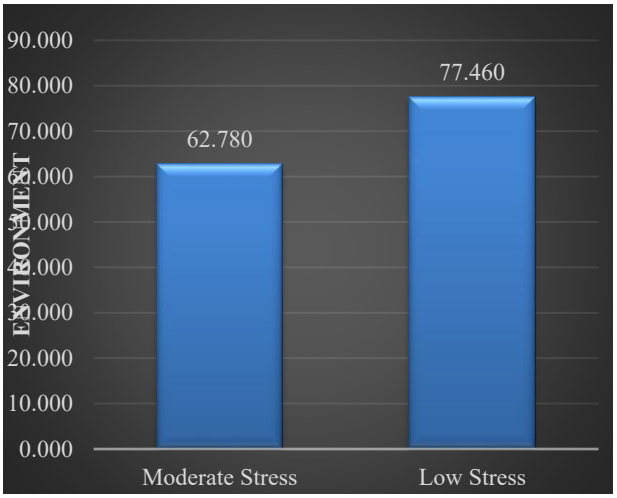


Figure 4: Environmental health based and stress.

Musculoskeletal fitness

Six standardized tests were administered. Apley's back scratch test assessed upper-limb flexibility by measuring the distance between the hands behind the back.[19] The seated push-up test assessed upper-limb strength by recording the number of repetitions completed in 30 seconds.[20] The 30-second sit-to-stand test assessed lower-limb strength by recording the number of complete repetitions in 30 seconds.[21] The weight-bearing lunge test assessed lower-limb flexibility by measuring the maximum distance achieved without lifting the heel.[22] The 1-minute step test assessed lower-limb endurance by recording the number of steps completed in one minute.[23] The arm curl test assessed upper-limb endurance by recording the number of curls completed in 30 second.[24]

Quality of life

Quality of life was assessed using the WHOQOL-BREF, which consists of 26 items covering physical health, psychological health, social relationships and environmental domains.[25] Higher domain scores indicated better quality of life.[26]

Statistical analysis

Statistical analysis was performed using SPSS version 29.0 (IBM SPSS Statistics for Windows, Version 29.0; IBM Corp., Armonk, NY). Descriptive statistics were presented as frequencies and percentages for categorical variables and mean±standard deviation for numerical variables. Categorical variables were analysed using the Chi-square test. Since the numerical variables were not normally distributed, they were analysed using the Mann–Whitney U test. A p value<0.05 was considered statistically significant.

A total of 76 participants were included in the study. The age of participants ranged from 30 to 59 years, with a mean age of 43.71±9.11 years. The majority belonged to the 50–54 years age group (30.3%), followed by 30–34 years (26.3%) and 45–49 years (21.1%). Regarding gender distribution, 61 participants (80.3%) were males and 15 (19.7%) were females. The mean height was 1.673±0.085 m, mean body weight was 68.075±11.505 kg and mean BMI was 24.306±3.463 kg/m². The association between musculoskeletal fitness components and perceived stress levels was assessed using the chi-square test. No statistically significant association was observed between perceived stress (high, moderate and low) and any of the musculoskeletal fitness measures, including Apley's Back Scratch (left and right), seated push-up, arm curl (left and right), 30-second sit-to-stand test, weight-bearing lunge (left and right) and 1-minute step test (left and right), as all p values were greater than 0.05. Across all fitness categories, the majority of participants consistently reported low to moderate perceived stress, with relatively few individuals experiencing high stress. These findings indicate that perceived stress levels did not differ significantly across varying levels of musculoskeletal fitness in the study population. Participants with low perceived stress demonstrated significantly higher scores across all four WHOQOL-BREF domains compared with those experiencing moderate stress. Statistically significant differences were observed in physical health (U=269.0, p<0.001), psychological health (U=334.0, p<0.001), social relationships (U=459.5, p=0.023) and environmental health (U=285.0, p<0.001).

Table 1: Distribution of participants based on demographic and anthropometric characteristics (n=76).

Variables	Category/parameter	Frequency (N)	(%)	Mean±SD	Minimum	Maximum
Age (in years)	30–34	20	26.3			
	35–39	5	6.6			
	40–44	7	9.2			
	45–49	16	21.1			
	50–54	23	30.3			
	55–59	5	6.6			
Gender	Female	15	19.7			
	Male	61	80.3			
Height (m)	—	—	—	1.673±0.085	1.44	1.85
Weight (kg)	—	—	—	68.075±11.505	52.00	114.00
BMI (kg/m²)	—	—	—	24.306±3.463	18.69	35.16

Table 2: Association between musculo skeletal fitness and perceived stress.

Musculo skeletal fitness	Category	Perceived stress				Chi square	P value
		High stress	Moderate stress	Low stress	Total		
Apley's Back Scratch (L)	Normal	1 (3.4%)	13 (44.8%)	15 (51.7%)	29 (100)	4.752	0.314
	Mild	1 (10.0%)	2 (20.0%)	7 (70.0%)	10 (100)		
	Severe	0 (0.0%)	15 (40.5%)	22 (59.5%)	37 (100)		
Apley's Back Scratch (R)	Normal	2 (4.7%)	18 (41.9%)	23 (53.5%)	43 (100)	2.05	0.727
	Mild	0 (0.0%)	5 (38.5%)	8 (61.5%)	13 (100)		
	Severe	0 (0.0%)	7 (35.0%)	13 (65.0%)	20 (100)		
Seated Push-Up	Average	0 (0.0%)	7 (38.9%)	11 (61.1%)	18 (100)	3.011	0.556
	Good	0 (0.0%)	11 (40.7%)	16 (59.3%)	27 (100)		
	Excellent	2 (6.5%)	12 (38.7%)	17 (54.8%)	31 (100)		
Arm Curl (L)	Average	0 (0.0%)	9 (50.0%)	9 (50.0%)	18 (100)	5.194	0.268
	Good	0 (0.0%)	13 (39.4%)	20 (60.6%)	33 (100)		
	Excellent	2 (8.0%)	8 (32.0%)	15 (60.0%)	25 (100)		
Arm Curl (R)	Below average	0 (0.0%)	0 (0.0%)	1 (100%)	1 (100)	6.458	0.374
	Average	0 (0.0%)	8 (47.1%)	9 (52.9%)	17 (100)		
	Good	0 (0.0%)	15 (45.5%)	18 (54.5%)	33 (100)		
	Excellent	2 (8.0%)	7 (28.0%)	16 (64.0%)	25 (100)		
30-Sec Sit-to-Stand	Normal	0 (0.0%)	16 (45.7%)	19 (54.3%)	35 (100)	2.493	0.287
	Excellent	2 (4.9%)	14 (34.1%)	25 (61.0%)	41 (100)		
Weight-Bearing Lunge (L)	Normal	2 (3.1%)	24 (37.5%)	38 (59.4%)	64 (100)	0.928	0.629
	Restricted	0 (0.0%)	6 (50.0%)	6 (50.0%)	12 (100)		
Weight-Bearing Lunge (R)	Normal	2 (3.0%)	24 (36.4%)	40 (60.6%)	66 (100)	2.169	0.338
	Restricted	0 (0.0%)	6 (60.0%)	4 (40.0%)	10 (100)		
1-Min Step Test (L)	Poor	0 (0.0%)	3 (100%)	0 (0.0%)	3 (100)	8.388	0.397
	Below average	0 (0.0%)	3 (50.0%)	3 (50.0%)	6 (100)		
	Average	0 (0.0%)	12 (40.0%)	18 (60.0%)	30 (100)		
	Good	1 (9.1%)	3 (27.3%)	7 (63.6%)	11 (100)		
	Excellent	1 (3.8%)	9 (34.6%)	16 (61.5%)	26 (100)		
1-Min Step Test (R)	Poor	0 (0.0%)	3 (100%)	0 (0.0%)	3 (100)	8.5	0.386
	Below average	0 (0.0%)	4 (50.0%)	4 (50.0%)	8 (100)		
	Average	0 (0.0%)	10 (41.7%)	14 (58.3%)	24 (100)		
	Good	1 (9.1%)	3 (27.3%)	7 (63.6%)	11 (100)		
	Excellent	1 (3.3%)	10 (33.3%)	19 (63.3%)	30 (100)		

Table 3: Comparison of WHOQOL-BREF domains based on perceived stress.

WHOQOL-BREF domain	Perceived stress	N	Mean	Std. deviation	U value	P value
Physical health	Moderate stress	30	68.687	14.400	269.0	<0.001
	Low stress	44	83.437	10.450		
Psychological health	Moderate stress	30	69.152	15.150	334.0	<0.001
	Low stress	44	81.178	11.938		
Social relationships	Moderate stress	30	71.663	12.874	459.5	0.023
	Low stress	44	81.056	12.103		
Environmental health	Moderate stress	30	62.780	15.727	285.0	<0.001
	Low stress	44	77.460	16.631		

DISCUSSION

The study examined the relationship between musculoskeletal fitness, perceived stress and quality of life among lawyers in Bengaluru. No statistically significant relationship was observed between musculoskeletal fitness and perceived stress, lower stress levels were highly linked to a higher quality of life in all domains. A total of 76 participants were included in the study. The age of the participants ranged from 30 to 55 years, with a mean age of 43.71±9.11 years. The largest proportion of participants

belonged to the 50–54 years age group (30.3%), followed by those aged 30–34 years (26.3%) and 45–49 years (21.1%). Participants aged 40–44 years constituted 9.2% of the sample, while the 35–39 years and 55–59 years age groups each accounted for 6.6% of the participants. Similar age characteristics was reported by Allen et al who examined physical activity and depression among 681 law professionals with a mean age of 47.61±12.53 years.[27] The majority of participants in the present study were male(80.3%), while females constituted 19.7%. A similar male predominance was reported by Shah et al among lawyers. The unequal gender distribution should, however, be considered when interpreting and generalising the findings.[27]

No statistically significant association was observed between perceived stress and any other musculoskeletal fitness, ($p>0.05$). this finding should be interpreted carefully because only two participants reported high perceived stress, resulting in an unequal distribution across stress categories and potentially reducing the statistical power to detect significant relationship. Therefore, the absence of statistical significance should not be interpreted as evidence that no relationship exists between perceived stress and musculoskeletal fitness. Previous literature has described a complex and potentially reciprocal relationship varying according to individual and methodological factors.[9] The findings of the present study may therefore reflect the multifactorial nature of the relationship between occupational stress and physical fitness.

This study's findings align with Sinha's systematic review, which indicated a complex and potentially reciprocal relationship between stress and physical exercise.[9] Although no significant relation was observed between musculoskeletal fitness and perceived stress, a significant relation was observed between perceived stress and quality of life. participants with low perceived stress had significantly higher physical health scores than those with moderate perceived stress (83.44±10.45) compared to those with moderate stress (68.69±14.40). This difference was statistically significant ($U=269.0$, $p<0.001$). The findings of this study differ to some extent with that Syed Umair Ali Shah et al, (2024) who found a significant positive correlation between lawyers' satisfaction with life and physical activity.[27] This finding indicated that higher perceived stress was associated with poorer perceived physical wellbeing.

Similarly, psychological health scores were significantly higher among participants with low perceived stress (81.18±11.95) compared with those with moderate perceived stress (69.15±15.15: $U=334.0$. $p<0.001$). This finding is consistent with previous research among lawyers reporting substantial occupational stress and psychological difficulties. Kasprzyk et al reported increased stress exposure and occupational difficulties among lawyers, while Azeem et al reported an association between professional stress and occupational burnout among lawyers.[28,29] The social relationship domain was also significantly higher among participants with low perceived stress (81.06±12.10) compared to participants experiencing moderate stress (71.66±12.87). occupational demands such as long working hours, court schedules, client interactions and work-related responsibilities may limit opportunities for family and social activities. Previous research conducted by Hussain et al on psychosocial stressors among lawyers has identified social and familial factors as important components of occupational stress.[16]

The environmental domain also demonstrated a significant difference between stress groups, with higher scores among participants with low perceived stress (77.46±16.63) compared to those with moderate stress (62.78±15.73). This finding may reflect the influence of occupational and financial circumstances on perceived environmental quality of life. Previous research by Azeem et al among lawyers has identified financial and occupational difficulties as important contributors to perceived stress.[29] The difference between the musculoskeletal fitness and quality-of-life scores is a noteworthy. While none of the assessed musculoskeletal fitness components showed a significant association with perceived stress, all four WHOQOL-BREF domains differed significantly between the low-and moderate-stress groups. This suggests that, in the present sample, perceived stress was related with subjective multidimensional well-being rather than with the individual physical fitness measures assessed.

Quality of life encompasses physical, psychological social and environmental aspects, whereas the fitness measures assess specific physical capabilities. Therefore, occupational stress may be reflected more readily in subjective quality-of-life measures than in individual field-based fitness tests. The findings have implications for the well-being of practicing lawyers. Workplace wellness initiatives for legal professionals may benefit from addressing not only physical activity and fitness but also stress management, work-life balance, psychological support and opportunities for regular physical activity. However, the present cross-sectional design does not permit conclusion regarding causality and the observed associations should therefore be interpreted accordingly.

Overall, the current study found that perceived stress was substantially related to all four categories of quality of life among practicing lawyers. Participants with low perceived stress reported considerably higher physical, psychological, social and environmental quality of life than those with moderate stress. However, no statistically significant relationship was found between felt stress and the evaluated components of musculoskeletal fitness. These findings highlight the importance of considering psychological and occupational well-being alongside physical fitness when addressing the overall health of practicing lawyers.

The cross-sectional design limits the ability to establish causal relationships. The study was conducted among lawyers in Bengaluru, limiting generalizability to other regions and legal settings. The relatively small samples size and unequal gender distribution may have influenced the findings. The fitness assessment did not include all components of physical fitness, such as muscular power, body composition and cardiorespiratory fitness. Potential confounders, including physical activity, sleep, working hours, type of practice, ergonomic factors, dietary habits and socioeconomic status, were not assessed.

CONCLUSION

The present study found no statistically significant relation between perceived stress and musculoskeletal fitness among practicing lawyers in Bengaluru. However, lower perceived stress was significantly related with better physical, psychological, social and environmental quality of life. These findings highlight the importance of addressing occupational stress and overall well-being among legal professionals. Further research with larger samples and longitudinal designs is recommended.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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