

**Effects of Yoga Practice on Stress Levels: A Comprehensive Analysis****Apta Mylsidayu*, Bujang, Elly Diana Mamesah**

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Individuals typically have dual effects when experiencing stress, namely a physical manifestation influencing their well-being during stressful episodes and a psychological impact characterized by cognitive, emotional, and behavioural symptoms. The objective of this investigation was to scrutinize the variables exerting influences on stress. Employing a cross-sectional analytical design, this study considered age, gender, employment position, and the duration of yoga practice as independent variables, while stress levels served as the dependent variable. The research involved 20 individuals who participated in a questionnaire test, supplemented by an additional 30 individuals serving as research subjects. The study population were 50 members drawn from fitness centres located in West Jakarta. The data collection relied on the Kessler Psychological Distress Scale questionnaire, probing into facets, such as age, gender, employment situations, and the frequency of yoga practice. The distribution of questionnaires used the Google Forms platform, administered by researchers presented at the research site. Employing a multiple linear regression as the method of data analysis, computations were executed through the JAMOVI statistical program. The findings of this study revealed a negative correlation between age, gender, employment situations, and the duration of yoga practice with stress levels. It suggests that these factors collectively contribute to the reduction in stress levels. However, despite a discernible 23.5 percent difference in stress levels, the impact remains inconspicuous.

INTRODUCTION

The examination of the influence of psychological stress on immune functions has constituted a focal point of extensive research endeavors (Marshall & Agarwal, 2000). The excessive stress is known to induce alterations in the quantity of immune cells and dysregulation of cytokines (Sinanovic et al., 2022). The impact of stress extends across diverse physiological systems, encompassing the musculoskeletal, respiratory, cardiovascular, endocrine, gastrointestinal, nervous, and reproductive systems (Amirkhan et al., 2018). In reaction to a stressor, a cascade of physiological changes is initiated to facilitate an individual adaptive coping mechanisms with the stressor (Padgett & Glaser, 2003).

Stress is delineated as an adaptive response to perceived threats, manifesting through conscious or unconscious processes (Fahrizal et al., 2021; Muslim & Ilmi, 2023). Stress is a psychological strain that includes a person inability to deal with dangers, difficulties in communication, and emotional shifts (Vissoi et al., 2018). The peril associated with stress emanates from the physical, emotional, and mental conditions precipitated by a sustained engagement with emotionally demanding situations (Karim, 2022). In high-income nations, the lifetime prevalence of any common mental health illness is projected to be 32.2%, while in low- and middle-income nations, it is predicted to be 25%. The lifetime prevalence of anxiety disorders is estimated to be 12.9% worldwide, whilst the lifetime prevalence of depression is considered to be between 10% and 15% (Popescu et al., 2010).

The physiological response of the human body to various demands or external loads is commonly defined as stress. Stressors exert a significant impact on moods, our perceptions of overall wellness, behavioral patterns, and physical health (Schneiderman et al., 2005). Within this conceptual framework, stress is elucidated as arising when an individual contends with a substantial load that surpasses their capacity for effective managements. Consequently, the body undergoes a stress response, marked by the heightened physiological reactivity and an inability to cope with the imposed load. According to the acute stress reactions observed in youthful, physically fit individuals may demonstrate the adaptability and typically do not present a significant health risk. Nevertheless, in cases where the stressor persists, particularly among elderly or less healthy individuals, the

prolonged effects of stress may detrimentally impact their health (Schneiderman et al., 2005). Furthermore, stress is acknowledged to emanate from circumstances where individuals grapple with a monotony, induced by a diverse array of demands that evoke a sense of underappreciation (Putranto, 2013). Drawn from the perspective articulated above, the nuanced nature of stress can be underlined, where its origins extend beyond the mere magnitude of a load to encompass broader psychosocial factors influencing an individual perception and management of stressors. It is evident that the concept of stress entails the intricacy of physiological and cognitive responses to external pressures or exigencies. This implies that stress can be defined as a state in which the challenges or burdens encountered by an individual are perceived to surpass their ability to manage or adjust. The stress response is orchestrated through a sophisticated interaction among nervous, endocrine, and immune systems, which entails the activation of the sympathetic-adrenomedullary (SAM) axis, the hypothalamic-pituitary-adrenal (HPA) axis, and the immune system (B. Chu et al., 2021). A profound comprehension of these dynamics establishes a cornerstone for delving further into the repercussions of stress on both physical and mental well-being. Several indicators of psychological and emotional stress encompass depression or anxiety, feelings of anger, irritability, restlessness, distress, lack of motivation, difficulties in concentration, disturbances in sleep patterns, excessive rumination or persistent worry, compromised memory or concentration, and impaired decision-making abilities (Simanullang & Situmorang, 2020).

Any internal or external trigger that elicits a biological reaction is recognized as stress (Yaribeygi et al., 2017). The effects of stress are multifaceted, encompassing both positive and negative outcomes. While stress can serve as a motivator, prompting individuals to exert greater efforts and seek improvements in their lives, it also poses numerous challenges and potential risks. According to Cox as cited in Riyadi (2018), stress can manifest in various ways, including (1) subjective impacts such as feelings of anxiety, aggression, apathy, boredom, depression, fatigue, frustration, diminished patience, low self-esteem, and loneliness, (2) behavioral effects such as inclination towards accidents, alcohol and substance abuse, emotional volatility, overeating, excessive smoking, impulsive actions, laughter, and nervousness, (3) cognitive consequences such as im-

paired decision-making abilities, reduced concentration, short attention span, increased sensitivity to criticism, and cognitive blocks, (4) physiological manifestations such as elevated blood sugar levels, increased heart rate and blood pressure, dry mouth, sweating, dilated pupils, and bodily tremors, and (5) organizational ramifications such as absenteeism, high employee turnover rates, declining productivity, strained relationships with colleagues, job dissatisfaction, and diminished organizational loyalty and commitment. It is noteworthy that physical activity plays a pivotal role in ameliorating the emotional stress, thereby contributing to an enhancement of both physical and psychological well-beings (Stults-Kolehmainen & Sinha, 2014). One method to reduce stress is the practice of yoga.

Yoga represents an ancient discipline grounded in Indian philosophy, encompassing spiritual, mental, and physical dimensions. Yoga, an ancient practice with a history spanning over 5000 years, has transitioned from its inception in ancient India to a universally acknowledged and embraced a holistic framework for health and well-being (Giridharan, 2023; Uebelacker et al., 2021). The integral components of yoga contribute to the promotion of physical, mental, and spiritual harmony. Yoga represents a systematic discipline, with its principles deeply embedded in various religious traditions; however, it is imperative to note that yoga as a practice is distinct from any specific religious affiliation (Rama, 1998). The contemporary scientific research has increasingly unveiled the potential therapeutic benefits of yoga, encompassing its efficacy in managing chronic medical conditions, mitigating stress, and enhancing overall health. Yoga serves as a modality for the management and alleviation of stress, providing individuals with a versatile and accessible means of achieving these objectives. Regardless of age, gender, or employment status, individuals are afforded the opportunity to engage in the practice of yoga, demonstrating its inclusivity and adaptability to diverse demographic profiles. This underscores the potential universality and efficacy of yoga as a method for stress mitigation, rendering it accessible to individuals across various life stages and socio-occupational contexts. Yoga has been demonstrated to alleviate stress and offer health advantages for various conditions associated with stress (I. H. Chu et al., 2023), depression, insomnia, anxiety, and chronic pain, while also enhancing conditions such as impaired circulation, diabetes, and hypertension (Taylor et al.,

2010). Substantial evidence also suggests that a regular yoga practice mitigates both the psychological and physiological repercussions of stress across various diseases (Sinanovic et al., 2022). The practice of yoga and meditation has been identified as influential in modulating cytokine levels within the body, thereby exerting regulatory controls over immune responses during stress periods.

In prior studies, yoga had demonstrated efficacy in stress reductions (Brisbon & Lowery, 2011; Gard et al., 2012; Rocha et al., 2012) and improvement of psychological well-being indicators linked to elevated stress levels, including the heightened anxiety (Li & Goldsmith, 2012), persistent negative thinking depression (Kinser et al., 2013), and mood (Streeter et al., 2010). The findings of Tong et al. (2021) suggested that the implementation of yoga interventions was effective to assist students in managing stress, as they demonstrated that yoga yielded superior immediate and long-term effects in the stress reduction compared to physical fitness training among college students.

The disparity between the present study and prior research resides in the composition of the research cohort. In previous investigations, participants were sourced from academic institutions and neighboring communities through email solicitations, distribution of brochures, and verbal referrals, primarily consisting of students. Conversely, in the current study, participants encompassed individuals actively engaging in yoga practices, whose demographic characteristics such as durations of yoga practice, age, gender, and employment status were meticulously analyzed.

Based on survey data derived from 50 members of West Jakarta fitness centers situated at the Puri Mansion Apartments and the Palm Fitness Mall, it was discerned that individuals engaged in yoga for diverse purposes. While existing research has extensively explored the positive effects of yoga practice on mental well-being, there remains a deficiency in comprehensive understanding regarding the tangible impact of yoga practice on stress levels, particularly among fitness participants at Puri Mansion Apartments and Palm Fitness Mall in West Jakarta. This study endeavors to bridge this research gap by furnishing a more exhaustive understanding of the nuanced influence exerted by yoga on stress levels within this particular population cohort.

In light of the aforementioned considerations, the

primary aim of this research was to systematically investigate the variables influencing stress levels among yoga practitioners, with the ultimate objective of identifying the principal variable exerting a predominant impact on stress outcomes, and attempts to achieve a comprehensive understanding of the magnitude to which yoga practice can impact stress levels in the targeted population.

METHODS

This study used a cross-sectional analytical research design. An analytical cross-sectional study is a quantitative non-experimental research design, aims to collect data from a cohort of participants at a single time point, and employs surveys or questionnaires to collect data from participants (Schmidt & Brown, 2021). The independent variables involved the length of yoga practice, age, gender, and employment status, while the dependent variable was stress level.

Participants

The study population comprised 50 individuals who were active members of fitness centers practicing yoga in Puri Mansion Apartments and Palm Fitness Mall, West Jakarta. This study comprised 20 participants engaged in questionnaire testing and a research sample of 30 participants selected through accidental sampling methods. Table 1 shows the characteristics of the research sample in more detail.

Table 1. Characteristics of The Research Samples

	Variables	Description	Amount	Total
	Length of yoga practice	< 1 month	5	30
		1 month	3	
		> month	22	
Participant	Age	25 – 36	23	30
		37 – 47	6	
		48 – 58	1	
	Gender	male	4	30
		female	26	
	Employment status	work	23	30
		unemployed	7	

Procedure and Instruments

The data collection was conducted using the Kessler Psychological Distress Scale questionnaire. The participants engaged in yoga practice were able to conveniently complete the questionnaire directly on their per-

sonal cellphones utilizing the Google Form platform. The data collection period spanned from March to November 2023. The Kessler Psychiatric Distress Scale (K10) was selected for its widespread utilization, accessibility, high predictive validity, and high factorial and construct validity in clinical assessments of psychological symptoms (Easton et al., 2017; Kessler et al., 2002, 2003).

The researcher translated the questions into Indonesia language before using The Kessler Psychological Distress Scale. The scale used a five-value response options for each question, namely 5 (all of the time), 4 (most of the time), 3 (some of the time), 2 (a little of the time), and 1 (none of the time). Ten questions made up the Kessler Psychological Distress Scale test. The results of adding the scores from the 10 questions reveal that a score of 10 is the least score and a score of 50 is the highest score. Table 2 presents the results of the translation process applied to the Kessler Psychological Distress Scale instrument. The Kessler Psychological Distress Scale trial involving 20 participants yielded statistically significant findings, with a Cronbach's alpha reliability coefficient of 0.899, suggesting a high questionnaire reliability.

Table 2. The Kessler Psychological Distress Scale

In the past 30 days how often ...
1. Did you feel tired out for no good reason.
2. Did you feel nervous.
3. Did you feel so nervous that nothing could calm you down.
4. Did you feel hopeless.
5. Did you feel restless or fidgety.
6. Did you feel so restless that you could not sit still.
7. Did you feel depressed.
8. Did you feel that everything was an effort.
9. Did you feel so sad that nothing could cheer you up.
10. Did you feel worthless.

Source: (Andrews & Slade, 2001)

Statistical Analysis

The statistical analysis undertaken in this research encompassed a series of methodical steps aimed at rigorously testing and analyzing data, with the overarching goal of attaining a profound comprehension of the impact of yoga practice on stress levels. The computations were executed employing the JAMOV statistical program, incorporating specific procedures such as the Shapiro-Wilk Test for assessing normality, the Homogeneity Test, and the utilization of multiple linear regression techniques to facilitate a thorough examination

of the datasets. This meticulous approach ensured a robust statistical exploration of the interplay between yoga practice and stress levels.

RESULT

This study examined a number of variables that could affect stress levels, including yoga practise, age, gender, and employment positions. The analysis of the study results employed regression analysis as the principal statistical technique. Before undertaking the regression analysis, the researcher diligently conducted a battery of diagnostic tests to assess the fulfillment of crucial assumptions. These included the Normality Test, the Homogeneity Test, the Autocorrelation Test, and the Classical Assumption Test. Additionally, specific assessments for multicollinearity and autocorrelation were integrated into the preliminary testing phase.

The presented output reveals a p-value of 0.805 and a Shapiro-Wilk statistic of 0.979. The discerned p-value greater than alpha ($0.805 > 0.05$) within the outcomes suggests that the data were characterized by a normal distribution. The observation that the p-value (sig) for each variable surpassed the 0.05 threshold (alpha) leads to the inference that the data sets for all variables exhibited homogeneity.

Table 3. Multicollinearity Test

	VIF	df1
Length of Yoga	0.464	1
Age	0.247	1
Gender	3.451	1
Employment Situation	2.991	1

The analysis revealed that each variable presented in the provided table 3 demonstrated a variance inflation factor (VIF) value below 10, indicating an acceptable level of multicollinearity in regression modeling. Moreover, the tolerance values associated with each variable exceeded the established threshold of 0.01. These discerned results collectively furnished a compelling evidence supporting the deduction that the independent variables encompassed within the regression model did not exhibit substantial relationships or multicollinearity. The observed VIF values below 10 and tolerance values above 0.01 collectively signify a con-

spicuous absence of multicollinearity among the independent variables, thereby enhancing the robustness and integrity of the regression model.

Table 4. Autocorrelation Test

Autocorrelation	DW Statistic	p
-0.00660	1.96	0.882

Predicted upon the provided data, the absence of autocorrelation was substantiated by the Durbin-Watson value closely approximating 2, thereby signifying an apparent dearth of significant autocorrelation within the residuals of the regression model. The interpretation of the p-value, quantified at 0.882 and surpassing the conventional significance threshold of 0.05, further supported the conclusion that there existed inadequate substance to reject the null hypothesis positing the absence of autocorrelation (table 4). In light of the discerned lack of autocorrelation and the p-value surpassing 0.05, it was deemed permissible to proceed with linear regression analysis on the dataset.

Table 5 shows the degree to which independent factors influence the dependent variable shown by the correlation level. The provided output revealed that all variables possessed the capacity to mitigate stress, as evidenced by the negative correlation values each variable demonstrated with respect to stress.

The length of yoga practice in the previous study was categorised into three categories, namely less than one month value 1, one month value 2, and more than one month value 3. Noting the correlation value of the length of yoga practice of -0.224, when the value was squared (R^2), a value of 0.0502 was obtained, meaning that yoga exercise could reduce stress levels by 5.02%. It indicates that the longer the yoga exercise the more the stress levels are reduced.

In the context of age, the correlation value was -0.329, attaining a value of 0.1082 when squared (R^2), suggesting that age had the potential to diminish stress levels by approximately 10.82%. The negative correlation implies that as age increases, stress levels tend to decrease.

Gender in this study was given a score of 1 and 2. Score 1 for men and score 2 for women. Gender had a correlation value of -0.341, obtaining a value of 0.1162

when squared (R²), meaning that gender could reduce stress levels by 11.62%. These results indicated that male members of the Fitness Centre Puri Mansion Apartment and Fitness Centre Palm Fitness Mall in West Jakarta had a higher stress level.

stress levels among members of Fitness Centre Puri Mansion Apartment and Fitness Centre Palm Fitness Mall in West Jakarta is detailed in Table 7.

Table 5. Hypothesis Testing Results

		Yoga Practice Duration	Age	Sex	Job Status	Stress Level
Length of Yoga	Pearson's r	—				
	p-value	—				
Age	Pearson's r	0.315	—			
	p-value	0.09	—			
Gender	Pearson's r	0.078	0.189	—		
	p-value	0.683	0.317	—		
Employment Situation	Pearson's r	0.013	0.163	-0.062	—	
	p-value	0.947	0.388	0.745	—	
Stress level	Pearson's r	-0.224	-0.329	-0.341	-0.196	—
	p-value	0.234	0.076	0.065	0.3	—

Table 6. Model Coefficients - Stress Level

Predictor	Estimate	SE	95% Confidence Interval		t	p
			Lower	Upper		
Intercept	64.467	16.612	30.255	98.679	3.881	< .001
Length of Yoga	-1.116	1.52	-4.247	2.015	-0.734	0.47
Age	-0.175	0.167	-0.519	0.169	-1.049	0.304
Gender	-12.199	7.189	-27.006	2.607	-1.697	0.102
Employment Situation	-4.33	4.285	-13.154	4.495	-1.011	0.322

Table 7. Model Fit Measures

Overall Model Test						
Model	R	R ²	F	df1	df2	p
1	0.485	0.235	1.92	4	25	0.139

The employment status in this study was given a score of 1 and 2, score 1 for not working status and score 2 for working status. The correlation value of the employment status was -0.196, attaining a value of 0.0384 when squared (R²), meaning that the employment status could reduce stress levels by 3.84%. This implies that individuals who are employed exhibit a capacity to mitigate stress levels. These findings suggest a correlation that individuals without employment tend to experience elevated stress levels.

The outputs in Table 6 show the t-values for Length of Yoga Practice (-0.734), Age (-1.049), gender (-1.697), and employment status (-1.011). The p-value for all variables was greater than 0.05, meaning that at the 95% confidence level all analysed factors did not significantly affect stress levels.

Moreover, the linear impact of the duration of yoga practice, age, gender, and employment status on

The report in Table 7 displays the 0.235 r² value. This number indicates that age, gender, work status, and the amount of time spent practising yoga all affected variations in stress levels by 23.5%. Given the f value of 1.92 and p-value of 0.135, it is possible to determine if age, gender, and employment position had a significant impact on stress levels in relation to the duration of yoga practise. We may therefore infer that the length of yoga practise, age, gender, and employment situation did not significantly affect stress levels, as the p-value was greater than 0.05 (0.135>0.050).

DISCUSSION

Diverse theoretical frameworks and models have been formulated to elucidate and forecast human responses to stress. Contemporary stress theories underscore, as fundamental components, an evaluative appraisal process and self-regulatory systems, as postulat-

ed by (Hancock & Szalma, 2008). This study explored how yoga reduced stress. The more frequently someone does yoga, the more stress-relieving effects it has. Demonstrated that yoga has a moderating effect on the nervous system, hormonal emissions, physiological factors, and regulation of nerve impulses, it can be useful in treating depression and mental disorders (Dalgas et al., 2008).

Drawn from the traits exhibited by the research samples, it is evident that the participants who were engaged in yoga practice for over one month were predominantly females aged between 25 to 36 years, actively employed. Hence, it can be inferred that one of the motivations for women in their productive working years to engage in yoga practice is to alleviate stress. Women tend to experience more chronic stress, daily stressors, and negative life events compared to men and also tend to use more emotion-focused coping strategies, leading to more somatic symptoms and psychological distress (Matud, 2004). Intense stress may lead to a significant temporary elevation in blood pressure, if stress persists over time, it can result in damage to blood vessels, the heart, and the kidneys (Kasmadi & Suhadi, 2024). To mitigate the adverse effects of stress, it is advisable to adopt a healthy lifestyle that promotes well-being and engage in physical activities, such as practicing yoga.

Various studies have shown that yoga has numerous benefits for mental and physical health, including reducing anxiety and depression, improving cognitive functions, increasing life satisfactions, improved physical fitness, enhanced mental states, and better cognitive functions (Telles et al., 2021). The findings of this study are in contrast with those of the author research results, which indicated that the duration of yoga practice, age, gender, and employment status did not significantly impact stress levels. However, this disparity may be attributed to the relatively short duration of yoga practice observed within the research sample. In line with the research findings of Chu et al. stating that the effects and mechanisms of yoga practice conducted within relatively short or limited sessions in relieving stress remain unclear (I. H. Chu et al., 2023). Maddux et al. (2018) study findings indicated that a 16-week yoga program resulted in reductions in stress, anxiety, depression, and sleep disturbances, while also fostering a heightened mindfulness and life balance. In essence, it

can be inferred that the impact of yoga practice may not be noticeable within a brief period, but its effectiveness tends to increase following a consistent practice over a span of 16 weeks. Significant improvements can be observed through engaging in exercise sessions at least three times per week (Mylsidayu & Kurniawan, 2015).

In essence, stress can strengthen mental toughness by training it to withstand difficult situations or environments. On the other hand, stress can cause disruptions to daily life if it is allowed to persist. The relationship between stress and mental toughness is complex. The impact of stress can vary from person to person. The medical profession should develop a deeper understanding of the substantial influence that stress could exert on diverse medical conditions and subsequently address patients accordingly, employing a combination of pharmacological approaches (such as medications and/or nutraceuticals) and non-pharmacological strategies (including lifestyle modifications, regular exercises, nutritious diets, and stress management programs) in therapeutic interventions (Yaribeygi et al., 2017).

In summary, the impact of stress on mental toughness depends on the nature, intensity, and duration of stressors. While manageable stress can contribute to resilience and mental toughness, the chronic stress poses a risk to overall well-being and can disrupt various aspects of daily life. This aligns with the assertions of Sarkar & Fletcher (2014) positing that the significance of psychological resilience in sports stems from the imperative for individuals to professionally employ and optimize a range of mental attributes to endure the diverse stresses inherent in their competitive endeavors. It is crucial for individuals to develop healthy coping strategies and seek supports when facing a prolonged or overwhelming stress. The findings of this study cannot be broadly applied due to the limited size of the sample. Future research endeavors could investigate cohorts with larger sample sizes, ensuring balanced representations by recruiting equal numbers of both male and female participants, particularly focusing on demographic groups afflicted by psychological disorders.

CONCLUSION

In summary, the research suggested that age, gender, employment status, and the length of yoga practice, while exhibiting correlations with stress levels, did not

possess significant individual or collective effects on stress at a statistically significant level. This occurrence may potentially be attributed to a brief period of intensive yoga practice and the constrained sample size in the research. Consequently, the outcomes of this study are applicable solely to the specific research sample and may not be considered representative of the broader population. Subsequent scholarly inquiry may contemplate examining individuals engaged in uninterrupted yoga practice over a period of 16 weeks, adhering to a regimen of no fewer than three sessions per week.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

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