The impact of distress on the immune system of adults aged 30-60 years

A psychoneuroimmunological investigation

Research Author: D Madhumitha madhumithadevarajan@gmail.com
Co-Author : Ms. Kavya Vijayan kavya.vijayan@jainuniversity.ac.in

Department of Psychology,
Jain University, Bengaluru, India

***Abstract*—**In today's fast-paced world, stress has become an unavoidable part of life, significantly affecting our mental and physical health. This research explores how psychological stress impacts overall health in adults between 30 and 60 years old, drawing on the science of psychoneuroimmunology—the study of how our minds influence our immune systems. We surveyed 88 participants using two well-established questionnaires: the Perceived Stress Scale and the General Health Questionnaire. Our findings revealed a strong connection between high stress levels and declining health. People experiencing more stress reported significantly more physical complaints, sleep problems, anxiety, social difficulties, and depressive symptoms. These results support the scientific understanding that chronic stress doesn't just affect our mood—it actually changes how our bodies function, weakening our immune defenses through biological pathways involving stress hormones and inflammation. This study adds important evidence from the Indian context and highlights the urgent need for better stress management programs to protect both mental and physical wellbeing.

Index Terms*—Perceived stress, general health, psychoneuroimmunology, immune function, distress, adults, GHQ-28, PSS-10, stress management, health psychology.*

I. Introduction

Stress has become a defining feature of modern life. While a little stress can sometimes motivate us, chronic stress takes a serious toll on both our minds and bodies. For adults between 30 and 60 years old, this life stage brings unique pressures—juggling demanding careers, caring for children and aging parents, managing finances, and dealing with their own health changes. These accumulated pressures can wear down both psychological resilience and physical health, making the body more vulnerable to illness.

The emerging field of psychoneuroimmunology helps us understand this connection scientifically. This area of research examines how our thoughts and emotions literally influence our immune system through complex interactions between the brain, hormones, and body chemistry. Pioneering work by researchers like Ader and Cohen in the 1970s first showed that immune responses could be influenced by psychological factors—proving that what happens in our minds directly affects our physical defenses. Later studies by Glaser and Kiecolt-Glaser built on this foundation, demonstrating that ongoing stress weakens immunity, slows healing, and promotes inflammation throughout the body.

While there's substantial research on stress and immunity from Western countries, we know surprisingly little about how these relationships play out among Indian adults, particularly those in their crucial middle years. This research aims to fill that gap. With increasing workplace demands, family pressures, and lifestyle challenges, stress has become a widespread problem affecting not just mental health but physical wellbeing too. Understanding these connections is essential for developing better support systems for this vital segment of our population.

A. The Problem We're Addressing

This study asks a fundamental question: Do people experiencing higher stress levels show worse overall health? We're particularly interested in understanding how stress affects different aspects of wellbeing—from physical symptoms to emotional struggles to social relationships. For adults navigating the demanding years between 30 and 60, when life responsibilities peak, understanding these connections could make a real difference in how we approach health and wellness.

B. What We Aimed to Discover

Our study had several goals. First, we wanted to examine whether there's a clear relationship between how stressed people feel and their overall health. Second, we aimed to identify which specific aspects of health suffer most when stress levels are high—whether it's physical complaints, sleep and anxiety issues, social functioning, or depression. Third, we wanted to provide concrete evidence supporting the theories that link our psychological state to our physical immune function. Finally, we hoped to make a strong case for better stress management programs that could genuinely improve people's health and immunity.

C. Our Predictions

Based on existing research, we expected to find two main patterns. First, we predicted that people reporting higher stress would also report worse overall health. Second, we anticipated that higher stress would be specifically linked to more physical symptoms, greater anxiety and sleep problems, more social difficulties, and increased depression.

D. Why This Matters

This research has important implications for psychology, medicine, and public health. It reinforces something many of us intuitively understand but science is only now fully confirming: our mental and physical health are deeply interconnected. When we understand how psychological stress weakens our immune system, doctors and therapists can develop better integrated treatment approaches. The findings could guide practical programs like mindfulness training, stress management workshops, and healthier lifestyle interventions. Given that people aged 30 to 60 are often at their peak of professional and family responsibilities, this research highlights why we urgently need more attention to mental health during these demanding life stages.

II. Understanding the Science Behind Stress and Health

A. How the Mind Affects the Immune System

Psychoneuroimmunology sounds complex, but the concept is straightforward: our psychological state directly influences how well our immune system protects us. When we're stressed, anxious, or depressed, our brain triggers a cascade of biological responses. Key immune cells—the soldiers that defend our bodies against illness—become less effective. This happens because chronic stress activates our body's alarm system, flooding us with stress hormones like cortisol. While these hormones help us respond to immediate threats, when they stay elevated for weeks or months, they actually suppress our immune defenses. The result? We become more prone to catching infections, our wounds heal more slowly, and inflammation increases throughout our body. This isn't just theory—it's measurable biology connecting our emotional state to our physical health.

B. The Three Stages of Stress Response

Back in the 1950s, researcher Hans Selye described how our bodies respond to stress in three stages. First comes the alarm phase—the familiar "fight or flight" response when we encounter a stressor. Then, if the stress continues, we enter the resistance phase where our body tries to cope and adapt. This works fine for a while, but eventually, with ongoing stress, we reach the exhaustion phase. This is when our defenses break down, making us vulnerable to illness. Understanding this progression helps explain why people can handle short bursts of stress reasonably well, but prolonged stress—the kind many adults face daily—eventually overwhelms our biological coping systems.

C. The Wear and Tear of Accumulated Stress

Researcher Bruce McEwen introduced an important concept called "allostatic load"—essentially, the cumulative wear and tear that stress inflicts on our bodies over time. Think of it like a car that's been driven hard for years without proper maintenance. Each stress response is like revving the engine—fine occasionally, but damaging when it happens constantly. For adults in their 30s through 60s who've been dealing with work pressure, family responsibilities, and life challenges for years or decades, this accumulated damage can be substantial. It manifests as inflammation, metabolic problems, and weakened immunity, setting the stage for serious health issues down the road.

D. How We Think About Stress Matters

Researchers Lazarus and Folkman made a crucial observation: stress isn't just about what happens to us, but about how we perceive and interpret those events. Two people facing the same situation may react completely differently based on whether they feel they can cope with it. When we view a challenge as overwhelming and beyond our abilities, that's when stress kicks in hard. This perspective is particularly relevant for adults in demanding life stages. Constant workplace pressures or caregiving responsibilities that feel unmanageable drain our coping resources, amplifying psychological strain and its physical consequences.

E. Health is More Than Just Biology

The biopsychosocial model reminds us that health and illness arise from the interplay of biological factors, psychological states, and social circumstances. You can't fully understand someone's health by looking only at their biology—you also need to consider their stress levels, coping skills, relationships, and life circumstances. This holistic view guides modern health psychology and forms the foundation for understanding how psychological distress translates into physical illness. Effective healthcare needs to address all these dimensions simultaneously.

III. What Other Research Has Found

A. International Evidence on Stress and Immunity

A massive review by Segerstrom and Miller, examining over 300 studies, found compelling evidence that chronic stress weakens cellular immunity, reduces important immune cells, and increases inflammation. Another influential study by Cohen and colleagues showed that people under high stress were significantly more likely to catch colds when exposed to viruses—direct proof that stress compromises immune defense. Glaser and Kiecolt-Glaser studied caregivers looking after chronically ill family members and found their immune function was measurably suppressed compared to non-caregivers. McEwen's research demonstrated that accumulated life stress predicts both immune dysfunction and heart disease risk. Together, these studies paint a clear picture: sustained psychological stress fundamentally alters how our immune system functions.

B. Research from India

Indian researchers have found similar patterns. Studies of mid-career professionals showed that work stress strongly correlates with physical complaints, sleep problems, and depression. Research on adults experiencing work-family conflict revealed worse mental and physical health scores. Urban adults with high perceived stress showed elevated blood pressure and poorer immune responses, directly linking stress to physical changes in the body. Another study concluded that psychological stress reduces resilience and increases vulnerability to chronic illness among Indian working adults. These findings confirm that the mind-body connection documented in Western research holds true across different cultural contexts, including India.

C. The Vulnerable Middle Years

Adults aged 30 to 60 face a perfect storm of stressors. This life stage often involves demanding careers, caring for both children and aging parents, financial pressures, and the beginnings of health challenges. Research consistently shows these combined pressures heighten vulnerability to both psychological distress and immune suppression. What might seem like purely psychological symptoms—anxiety, insomnia, persistent fatigue, depression—are actually signs of deeper physiological problems. Stress hormones like cortisol weaken the immune system's ability to fight infections and control inflammation. Over time, this contributes to serious conditions like high blood pressure, metabolic disorders, and autoimmune diseases.

D. Gaps in Current Knowledge

Despite considerable research globally, important gaps remain. Most studies focus on Western populations with limited data from Indian adults. Existing Indian studies often use small, homogeneous samples that may not represent broader populations. Few studies specifically examine the 30-60 age group despite its importance. There's also limited research using online data collection methods, which became especially relevant during and after the pandemic. Our study addresses these gaps by using validated assessment tools with a diverse sample of Indian adults in this crucial age range.

IV. How We Conducted This Study

A. Our Research Approach

We used a straightforward correlational design to examine the relationship between perceived stress and general health. This approach allowed us to see how strongly these factors are connected in real life without manipulating variables in artificial laboratory conditions. While this doesn't prove direct causation, it provides valuable evidence about how stress and health relate in everyday situations.

B. Who Participated

We focused on adults aged 30 to 60 living in urban areas across India—people in those demanding middle years juggling careers, families, and personal health. We recruited participants who could read English and had internet access to complete our online survey. We specifically chose people willing to voluntarily participate in research about their stress and health. Starting with 124 responses, we carefully screened the data and retained 88 complete, valid responses for our final analysis.

C. What We Measured

We measured two main things. First, perceived stress—essentially how stressed people felt over the past month, which served as our independent variable. Second, general health—covering physical symptoms, anxiety and sleep problems, social functioning, and depression, which was our dependent variable or outcome of interest.

D. The Tools We Used

The Perceived Stress Scale (PSS-10): This widely-used 10-item questionnaire asks people to rate how often they've felt stressed, overwhelmed, or unable to control important things in their life during the past month. Scores range from 0 to 40, with higher scores indicating more stress. The scale is highly reliable and has been validated across many different populations. Scores are interpreted as low stress (0-13), moderate stress (14-26), or high stress (27-40).

The General Health Questionnaire (GHQ-28): This 28-item assessment evaluates four key areas of health: physical symptoms (like fatigue and headaches), anxiety and sleep problems, ability to function socially and at work, and symptoms of depression. Each item is rated on a 4-point scale, with total scores ranging from 0 to 84. Higher scores indicate worse health or greater distress. A total score above 23 suggests significant health concerns. This tool has proven extremely reliable for screening psychological and physical health problems in general populations.

E. How We Collected the Data

We created an online survey using Google Forms and distributed it through email, WhatsApp, and social media to reach a diverse group of adults. The survey began with clear information about the study and asked participants to provide their consent before continuing. They then answered demographic questions about their age, gender, occupation, and education, followed by the stress and health questionnaires. Most people completed the survey in about 20-25 minutes. Responses were automatically collected in a database that we then exported to statistical software for analysis.

F. Ethical Considerations

We took ethics seriously throughout this research. Every participant provided informed consent before starting. All data was collected anonymously—we didn't collect any identifying information. People were clearly told participation was voluntary and they could stop at any time without consequence. The study received approval from Jain University's ethics committee. We also provided information about mental health helplines in case anyone felt distressed while completing the survey about their stress and wellbeing.

G. How We Analyzed the Data

We used standard statistical software (SPSS Version 26) to analyze our data. First, we calculated basic descriptive statistics—averages, standard deviations, and ranges—for all our measures. Then we used Pearson's correlation coefficient to determine how strongly stress levels related to health outcomes. We calculated correlations between stress scores and overall health, as well as between stress and each specific health dimension. We set our significance level at p less than .05, meaning we'd be confident in any relationship that had less than a 5% probability of occurring by chance. We interpreted correlations as weak (.10-.29), moderate (.30-.49), or strong (.50-1.00).

V. What We Found

A. Preparing the Data

Our online survey made data collection efficient and accurate. From 124 initial responses, we carefully reviewed each submission and excluded any that were incomplete or inconsistent, leaving us with 88 valid cases. We checked for missing data and statistical outliers that might skew our results—fortunately, we found none that significantly affected the data. All our variables showed normal distributions, meeting the assumptions needed for correlation analysis.

B. Stress and Health Levels in Our Sample

Looking at our participants' scores revealed concerning patterns. Table I shows the detailed breakdown.

Table I

Average Stress and Health Scores Among Participants (N = 88)

What We Measured	Number	Average	Variation	Lowest	Highest
Perceived Stress Level	88	22.84	6.31	10	36
Overall Health Score	88	34.72	11.45	12	63
Physical Symptoms	88	8.64	3.12	3	15
Anxiety and Sleep Problems	88	9.88	3.67	2	18
Social Functioning	88	9.06	2.95	3	16
Depression Symptoms	88	7.14	2.86	2	14

Note: Higher stress scores mean more stress; higher health scores mean worse health.

The average stress score of 22.84 falls in the moderate-to-high range, indicating our participants were experiencing significant stress. Their health scores suggested mild-to-moderate health problems across various dimensions. Notably, anxiety and sleep problems showed the highest average score, suggesting these were the most affected areas for people under stress.

C. The Stress-Health Connection

We calculated correlation coefficients to see how stress levels related to health outcomes. Table II presents these relationships.

Table II

How Stress Relates to Different Aspects of Health

Relationship Examined	Correlation	Statistical Significance	Strength
Stress & Overall Health	.658	< .001	Strong positive
Stress & Physical Symptoms	.594	< .001	Strong positive
Stress & Anxiety/Sleep	.642	< .001	Strong positive
Stress & Social Functioning	.518	< .001	Moderate positive
Stress & Depression	.611	< .001	Strong positive

D. What These Numbers Mean

The correlation of .658 between stress and overall health is quite strong and highly significant statistically (p less than .001 means there's less than a 0.1% probability this occurred by chance). In practical terms, this means people reporting higher stress levels consistently reported worse health across multiple dimensions.

Breaking this down by specific health areas, we found strong correlations with anxiety and sleep problems (.642) and depression (.611)—suggesting stress hits emotional wellbeing and sleep hardest. Physical symptoms also showed a strong correlation (.594), confirming that stress manifests in the body through fatigue, aches, and other complaints. Social functioning showed a moderate correlation (.518), indicating stress also affects relationships and work performance. All these relationships were highly statistically significant, meaning we can be very confident they're real patterns, not random coincidences.

VI. What It All Means

A. The Overall Message

Our main finding confirms what many people intuitively feel but science needed to prove: higher stress directly relates to worse health. This aligns with previous research showing chronic stress disrupts immune function and makes people more vulnerable to infections. Other studies have demonstrated that long-term stress elevates inflammatory chemicals in the body while suppressing immune defenses. In our study, adults experiencing more stress reported more physical complaints, greater anxiety, social difficulties, and depression. This confirms that stress isn't just "in your head"—it's a genuine health issue affecting both mind and body simultaneously.

B. How Stress Affects Different Aspects of Health

Physical symptoms: The strong link between stress and physical complaints like fatigue, muscle tension, and headaches makes biological sense. When stress hormones stay elevated, they suppress immune function, making the body more vulnerable and symptomatic. For people in their 30s through 60s dealing with chronic life stressors, this physiological disruption can accumulate over years, connecting psychological distress to physical health decline.

Anxiety and sleep: The strongest correlation we found was between stress and anxiety/insomnia. When people feel overwhelmed by life demands that exceed their coping abilities, anxiety naturally increases. This triggers physiological arousal that disrupts sleep, creating a vicious cycle—poor sleep further weakens immune function and coping abilities, leading to more stress and anxiety. This finding highlights why sleep problems deserve serious attention as both a symptom and contributor to the stress-health connection.

Social functioning: Stress doesn't just affect how we feel individually—it impacts our relationships and work performance too. High stress often leads to social withdrawal, irritability, and reduced effectiveness at work. People may avoid social situations, snap at family members, or struggle to concentrate on tasks. This moderate correlation reminds us that stress has important interpersonal consequences, potentially isolating people precisely when they need social support most.

Depression: The strong link between stress and depression underscores the emotional toll of prolonged pressure. Persistent stress can alter brain chemistry, particularly affecting neurotransmitters like serotonin that regulate mood, while elevated cortisol contributes to depressive symptoms. This finding supports the theory that chronic stress creates cumulative physiological wear and tear, increasing vulnerability to mood disorders alongside weakened immunity.

C. Connecting to Broader Scientific Understanding

Our findings fit well with established scientific theories. The psychoneuroimmunology framework explains how psychological states influence immune processes through stress hormones and inflammatory chemicals. The allostatic load concept illuminates how prolonged stress hormone exposure causes cumulative damage, reducing immune efficiency and disease resistance. Our participants in their middle adult years are particularly vulnerable to these accumulated effects. The cognitive appraisal perspective reminds us that it's not just events themselves but how people perceive and interpret them that determines health impacts. The biopsychosocial model ties it all together, confirming that health requires addressing mental, physical, and social dimensions simultaneously.

D. Comparing Our Findings to Other Research

Our results echo findings from both international and Indian studies. Global research has shown stress negatively affects immune markers, delays healing, and increases infection vulnerability. Indian studies of professionals found high work stress predicts decreased wellbeing. Research on Indian urban adults confirmed psychological distress predicts health impairment and reduced resilience. By demonstrating similar patterns among adults aged 30-60, our study contributes valuable Indian evidence to the global scientific understanding of stress-immune interactions.

E. Practical Implications

For healthcare providers: Mental health professionals and doctors should routinely assess stress levels in adult patients and design personalized interventions. Techniques like cognitive-behavioral therapy, mindfulness training, and relaxation strategies can reduce psychological distress and its physical manifestations.

For workplaces: Given that adults aged 30-60 often face occupational burnout, organizations have a responsibility to prioritize employee wellbeing. Stress audits, employee assistance programs, mindfulness sessions, flexible work arrangements, and supportive management practices can significantly reduce chronic workplace stress.

For public health: The strong link between stress and health outcomes demands national attention. Public health initiatives should promote mental wellbeing as integral to preventive healthcare, not as an afterthought. Stress awareness campaigns, accessible mental health services, and community support programs could make a real difference.

F. Study Limitations

We should acknowledge some limitations. Our cross-sectional design captures a snapshot in time but can't prove that stress directly causes health problems—that would require following people over months or years. We relied on self-reported questionnaires, which can be influenced by how people perceive and report their experiences. Our online survey may have excluded people without internet access or digital literacy. We didn't measure biological markers like cortisol levels or immune cells, which would provide direct physiological evidence. Future research should address these limitations through longitudinal designs and biological measurements.

VII. Conclusions and Recommendations

A. Key Takeaways

This study set out to understand how psychological stress affects health among adults in their crucial middle years. We surveyed 88 people and found compelling evidence: higher stress strongly predicts worse health across physical, emotional, and social dimensions. Anxiety/sleep problems and depression showed the strongest connections to stress, followed closely by physical symptoms and social functioning difficulties. These aren't trivial findings—they demonstrate that stress operates through multiple biological pathways, affecting how we feel, how our bodies function, and how we relate to others.

B. Main Conclusions

Several clear conclusions emerge from this work. First, psychological stress genuinely impacts physical health—it's not just a mental health issue. Adults experiencing higher stress show more physical symptoms, greater anxiety, sleep disturbances, and social difficulties. Second, our emotional state and immune health are intimately connected. Chronic stress triggers biological changes—elevated stress hormones, reduced immune activity—that lead to both mental and physical exhaustion. Third, the life stage between 30 and 60 represents a particularly vulnerable period. During these years, people juggle peak career demands, family responsibilities, and financial pressures, making them susceptible to sustained stress and its health consequences. Finally, we need integrated approaches to health. Effective interventions must combine psychological support, stress management, mindfulness practices, and lifestyle changes to build resilience and strengthen both mental and physical wellbeing.

C. Contributions to Scientific Understanding

This research adds to scientific knowledge by providing concrete evidence that psychological and physical health are inseparable. What happens in our minds manifests in measurable biological changes. These findings suggest that psychological assessment and treatment should increasingly incorporate biological markers of stress, helping bridge psychology with neuroscience and immunology. The results also reinforce the biopsychosocial framework as the most comprehensive way to understand health—effective healthcare must address mental, physical, and social factors together, not in isolation.

D. What This Means in Practice

In clinical settings: Therapists, counselors, and doctors should make stress assessment a routine part of patient care. Personalized interventions might include relaxation training, cognitive strategies to reframe stressful situations, and techniques for better emotional regulation. The goal isn't to eliminate all stress—that's impossible—but to help people manage it more effectively before it damages their health.

In workplaces: Companies need to take employee stress seriously as a health and productivity issue. This might involve regular stress assessments, accessible counseling services, mindfulness or meditation programs, more flexible work arrangements, and fostering supportive management cultures. Preventing burnout isn't just good for employees—it benefits organizations through reduced absenteeism, better performance, and lower healthcare costs.

In communities: Public health programs should actively promote stress awareness and healthy coping strategies. This could include community workshops on stress management, accessible mental health services, educational campaigns about the mind-body connection, and building social support networks. Making these resources available and destigmatizing their use could significantly improve population health.

Complementary approaches: Evidence increasingly supports techniques like yoga, meditation, deep breathing exercises, and mindfulness-based therapies for reducing stress and enhancing immune function. These practices work by calming the stress response system, reducing inflammation, and promoting relaxation. They're particularly valuable for people facing ongoing life pressures who need sustainable, accessible tools for stress management.

E. Directions for Future Research

This study opens doors for further investigation. Future research should incorporate biological measurements—stress hormone levels, immune cell counts, inflammatory markers—to provide direct physiological evidence of stress effects. Following people over time through longitudinal studies would help establish whether reducing stress actually improves immune function and health outcomes. Researchers should explore how gender, occupation, income level, and other factors influence stress-health relationships. Studies comparing different interventions—mindfulness versus therapy versus lifestyle changes—could identify what works best for whom. Finally, encouraging collaboration between psychologists, neuroscientists, immunologists, and medical doctors could deepen our understanding of how mind and body interact.

F. Final Thoughts

Perhaps the most important message from this research is deceptively simple: mental health and physical health aren't separate things. They're two sides of the same coin, inextricably linked through complex biological pathways. When we experience psychological stress, it doesn't stay "in our heads"—it travels through our nervous system, alters our hormones, affects our immune cells, and changes how our entire body functions. Conversely, taking care of our mental health isn't just about feeling better emotionally; it's essential for maintaining physical wellbeing and a strong immune system.

For adults between 30 and 60—those navigating demanding careers, caring for families, managing finances, and facing their own health transitions—this connection becomes especially critical. These are years when stress can accumulate silently, gradually wearing down both psychological resilience and physical defenses. Left unaddressed, this accumulated stress burden disrupts the body's balance and paves the way for chronic illness.

The good news? Understanding these connections empowers us to do something about them. Stress management isn't a luxury or self-indulgence—it's a legitimate health intervention with real biological benefits. Whether through therapy, mindfulness, exercise, social connection, or lifestyle changes, investing in stress reduction pays dividends in both mental and physical health. As a society, we need to make this understanding central to how we approach healthcare, design workplaces, and support our communities. The evidence is clear: protecting mental health is protecting overall health, especially for those navigating the demanding but vital middle years of adulthood.

Acknowledgment

We're deeply grateful to all the participants who generously shared their time and experiences for this research. Without their willingness to honestly report on their stress and health, this study wouldn't have been possible. We also thank Jain University for providing institutional support and ensuring this research met ethical standards. This work was conducted independently without specific funding from external agencies.

References

[1] R. Ader and N. Cohen, "Behaviorally conditioned immunosuppression," *Psychosomatic Medicine*, vol. 37, no. 4, pp. 333-340, 1975.

[2] R. Ader, D. L. Felten, and N. Cohen, *Psychoneuroimmunology*, 2nd ed. Academic Press, 1991.

[3] S. Cohen, D. Janicki-Deverts, W. J. Doyle, G. E. Miller, E. Frank, B. S. Rabin, and R. B. Turner, "Chronic stress, glucocorticoid receptor resistance, inflammation, and disease risk," *Proceedings of the National Academy of Sciences*, vol. 109, no. 16, pp. 5995-5999, 2012.

[4] S. Cohen, T. Kamarck, and R. Mermelstein, "A global measure of perceived stress," *Journal of Health and Social Behavior*, vol. 24, no. 4, pp. 385-396, 1983.

[5] R. Das and V. Bhatnagar, "Psychological stress and its impact on well-being: Evidence from Indian working adults," *Indian Journal of Health and Wellbeing*, vol. 12, no. 3, pp. 294-300, 2021.

[6] G. L. Engel, "The need for a new medical model: A challenge for biomedicine," *Science*, vol. 196, no. 4286, pp. 129-136, 1977.

[7] R. Glaser and J. K. Kiecolt-Glaser, "Stress-induced immune dysfunction: Implications for health," *Nature Reviews Immunology*, vol. 5, no. 3, pp. 243-251, 2005.

[8] D. P. Goldberg and V. F. Hillier, "A scaled version of the General Health Questionnaire," *Psychological Medicine*, vol. 9, no. 1, pp. 139-145, 1979.

[9] R. S. Lazarus and S. Folkman, *Stress, Appraisal, and Coping*. Springer, 1984.

[10] B. S. McEwen, "Protective and damaging effects of stress mediators," *New England Journal of Medicine*, vol. 338, no. 3, pp. 171-179, 1998.

[11] B. S. McEwen, "Physiology and neurobiology of stress and adaptation: Central role of the brain," *Physiological Reviews*, vol. 87, no. 3, pp. 873-904, 2007.

[12] R. Menon, A. George, and L. Joseph, "Occupational stress and psychological well-being among urban adults," *Indian Journal of Psychological Medicine*, vol. 41, no. 4, pp. 355-362, 2019.

[13] S. Ramesh and V. Kumar, "Work-family conflict and health outcomes among Indian professionals," *Journal of the Indian Academy of Applied Psychology*, vol. 42, no. 2, pp. 320-329, 2016.

[14] S. C. Segerstrom and G. E. Miller, "Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry," *Psychological Bulletin*, vol. 130, no. 4, pp. 601-630, 2004.

[15] H. Selye, *The Stress of Life*. McGraw-Hill, 1956.

[16] R. Srivastava and R. Tiwari, "Occupational stress and its effects on health and job performance: A study among Indian professionals," *Indian Journal of Occupational Health and Safety*, vol. 58, no. 2, pp. 112-118, 2014.

[17] E. S. Epel, E. H. Blackburn, J. Lin, F. S. Dhabhar, N. E. Adler, J. D. Morrow, and R. M. Cawthon, "Accelerated telomere shortening in response to life stress," *PNAS*, vol. 101, no. 49, pp. 17312-17315, 2004.