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# Mediation effects of engagement and job satisfaction between Herzberg's theory and performance: with moderation role of abusive supervision

Md. Abu Issa Gazi<sup>a,b</sup>, Abdullah Al Masud<sup>c</sup>, Md. Emon<sup>c</sup>, Mohammad Bin Amin<sup>d</sup>, Amani AbdAlatti<sup>e</sup>, Sukanta Biswas<sup>f</sup>, Abdul Rahman bin S Senathirajah<sup>b</sup> and Veronika Fenyves<sup>d</sup>

<sup>a</sup>School of Management, Jiujiang University, Jiujiang, China; <sup>b</sup>Faculty of Business and Communications, INTI International University, Persiaran Perdana BBN Putra Nilai, Nilai, Negeri Sembilan, Malaysia; <sup>c</sup>Department of Management Studies, University of Barishal, Barishal, Bangladesh; <sup>d</sup>Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary; <sup>e</sup>Applied Management Program, Applied College at Muhyle Assir, King Khalid University, Abha, Saudi Arabia; <sup>f</sup>Department of Management, Bajua Surendranath College, Khulna, Bangladesh

## ABSTRACT

The purpose of our research is to examine the dual mediation effect of job satisfaction and engagement on the association between job performance and hygiene parameters. These mediators were selected for capturing the varied routes by which hygiene factors affect job performance, as engagement and satisfaction represent distinct components of employee well-being. Additionally, this study investigates how abusive supervision moderates job engagement and job satisfaction on job performance, which may lessen the benefits of good work circumstances on performance. A quantitative study method is employed by surveying 410 Bangladeshi workers in the government, semi-government and private sectors. Structural equation modeling is utilized to analyze the data in order to look for correlations and moderating effects. The findings indicate that hygiene factors have a significant positive effect on job engagement and satisfaction, which improves performance. Nevertheless, these effects are weakened by abusive supervision because employees under such authority exhibit lower performance even when they are highly engaged with their work and satisfied with it. This study expands on Herzberg's Two-factor Theory for examining abusive supervision as a moderating component. It illustrates how poor supervisory behaviors can negate the positive influence of job engagement and satisfaction on performance. The research stresses the need for supportive supervisory practices so as to improve employee productivity.

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## 1. Introduction

Employee job engagement and satisfaction rely heavily on effective performance within any organization. These elements are essential for boosting individual productivity and ensuring the organization's overall success. Job engagement, which involves employees' emotional, cognitive, and physical dedication to their work, is critical in determining job satisfaction and performance (Bareket-Bojmel et al., 2023; Kumar et al., 2018). Similarly, job satisfaction, the positive emotional state resulting from evaluating one's job or job experiences, is crucial in influencing employee attitudes and behaviors (Locke et al., 1976;

**CONTACT** Md. Abu Issa Gazi ✉ [maigazi@yahoo.com](mailto:maigazi@yahoo.com); [issanur1982@gmail.com](mailto:issanur1982@gmail.com) School of Management, Jiujiang University, Jiujiang, 332005, China; Abdullah Al Masud ✉ [aamasud@bu.ac.bd](mailto:aamasud@bu.ac.bd) Department of Management Studies, University of Barishal, Barishal 8254, Bangladesh; Mohammad Bin Amin ✉ [binamindu@gmail.com](mailto:binamindu@gmail.com) Faculty of Economics and Business, University of Debrecen, Debrecen, 4032, Hungary.

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Mohammad et al., 2024). Job satisfaction, a positive emotional state resulting from evaluating one's job, significantly affects turnover intentions, making it necessary for both employees and employers. Job performance, essential for organizational productivity and success, depends on employees' efficiency and effectiveness. Poor performance results in lower production, inferior-quality goods, increased costs, and unhappy customers. Job dissatisfaction is a primary cause of poor performance, emphasizing the crucial role of overall job satisfaction (Sabeng & Mensah, 2023). Increasing employee job satisfaction helps organizations attract talent and lower costs. Achieving superior performance hinges on job satisfaction (Farias, 2023). Modern leadership prioritizes employee satisfaction to foster outstanding performance (Van Thang & Nghi, 2022). Satisfied employees contribute creativity and innovation, leading to breakthroughs in the market and high-quality products (Gazi et al., 2022; Mardanov, 2020). Job engagement, involving cognitive, emotional, and physical commitment, enhances satisfaction and dedication (Kumar et al., 2018). According to Herzberg's Two-Factor Theory, hygiene factors such as organizational policies, work environment, relationships, and benefits play critical roles in job satisfaction (Ann & Blum, 2020). Improving satisfaction among government employees enhances productivity, efficiency, and public service delivery.

At the heart of discussions on job engagement and satisfaction lies Herzberg's Two-Factor Theory, which differentiates between hygiene factors (e.g., organizational policies, working conditions, interpersonal relationships) and motivation factors (e.g., recognition, achievement, growth opportunities) (Herzberg, 1965). Despite widespread validation of Herzberg's theory across different contexts (Kotni & Karumuri, 2018), gaps still need to be addressed, especially regarding the moderating impact of abusive supervision and the mediating role of job engagement and satisfaction.

Abusive supervision involves supervisors displaying hostile behaviors towards their subordinates, such as verbal abuse, humiliation, and unfair treatment (Tepper, 2000). Studies indicate that abusive supervision can diminish the beneficial impacts of job engagement and satisfaction on performance (Tepper et al., 2017). Previous research has primarily focused on the direct connections between hygiene factors, job engagement, job satisfaction, and performance. However, previous research has focused on the distinct aspects of job engagement, satisfaction, and performance; it has not extensively explored the concept of dual mediation, which refers to the joint role of engagement and satisfaction in mediating the relationship between hygienic factors and job performance. In particular, in developing nations, examining these mediators collectively provides a more nuanced understanding of employee dynamics in the government, semi-government, and private organizations in developing countries.

Understanding the moderating impact of abusive supervision is vital for developing effective interventions that can mitigate its negative consequences and cultivate a positive work environment conducive to high performance. This study addresses this gap by investigating the interactions among hygiene factors, job engagement, job satisfaction, and job performance among Bangladesh government, semi-government, and private sector employees. Specifically, this study also makes a contribution by looking at abusive supervision as a moderator. Few research examine how abusive supervision modifies the impact of engagement and satisfaction on performance. Considering this moderation in the unique context of organizations in developing countries strengthens its significance.

Numerous studies have assessed the validity of Herzberg's theory and its relationship with job satisfaction, particularly in developed countries (Derby-Davis, 2014; Fareed & Jan, 2016; Kotni & Karumuri, 2018; Matei & Abrudan, 2016). Research has explored Herzberg's theory in various sectors, including retail (Tan & Waheed, 2011), banking (Fareed & Jan, 2016), cultural contexts (Matei & Abrudan, 2016), and tourism and hospitality (Hyun & Perdue, 2017). Additionally, some studies have applied Herzberg's theory to examine job satisfaction in the hotel industry (Zopiatis et al., 2017). Other research has investigated abusive supervision's impact on employees (Ramachandaran et al., 2024) and Herzberg's theory about job satisfaction, specifically within the hotel industry (Sobaih & Hasanein, 2020). This research examines job satisfaction, engagement, and performance under the moderating influence of abusive supervision by combining Herzberg's Two-Factor Theory with Social Exchange Theory. Herzberg's approach emphasizes the importance of hygienic elements in reducing dissatisfaction and promoting performance, such as relationships, organizational policies, and working circumstances (Sobaih & Hasanein, 2020). According to social exchange theory, abusive supervision decreases mutual trust and equity, which in turn affects worker happiness, engagement, and output (Dhali et al., 2023).

Maintaining constant job performance is a key challenge for firms, especially in emerging countries with complicated workplace dynamics. The research, which is guided by Herzberg's Two-Factor Theory, focuses on hygiene elements that are crucial for minimizing dissatisfaction, which is a required indicator for improved performance. While motivational factors promote satisfaction, hygienic elements create the framework for stability, making them especially important in situations where dissatisfaction is widespread. Moreover, numerous studies have found a positive association between hygiene factors and increasing levels of job satisfaction in developing countries. Despite the fact that hygiene aspects are beneficial in preventing job dissatisfaction, the findings of these studies show that in different companies, extrinsic factors—like competitive pay and job stability—have a bigger influence on satisfaction than intrinsic factors (Sobaih & Hasanein, 2020). This study specifically focuses on hygiene aspects rather than motivating variables, which generally enhance contentment without directly addressing dissatisfaction. However, the role of job satisfaction and engagement as dual mediators in the relationship between hygienic characteristics and job performance is unexplored, particularly in developing nations such as Bangladesh. This dual mediation provides a new perspective by emphasizing the unique but complementary functions of satisfaction and engagement in improving performance.

Previous research also overlooks how abusive supervision might moderate the relationships between job engagement and job satisfaction on job performance. Understanding this moderating role is crucial for developing effective interventions to mitigate the negative impacts of abusive supervision and cultivate a positive work environment that promotes high performance. Complicating matters further is abusive supervision, which is defined by antagonistic supervisory actions. Although some research supports its short-term advantages, such as greater alertness (Li et al., 2022), this study argues that in developing countries like Bangladesh, its long-term consequences, such as increased anxiety and demotivation, outweigh these advantages. Particularly, some scholars claim that abusive supervision might motivate employees to perform harder and make fewer mistakes (Liao et al., 2016; Liu et al., 2012). This study takes a dual approach, investigating how abusive supervision moderates the effects of job engagement and job satisfaction on job performance. By addressing these gaps, this study gives novel insights into the mechanisms that drive job performance in developing economies, as well as practical advice for balancing supervisory techniques and dynamics at work.

This study seeks to fill these research gaps by offering a more detailed insight into the factors that impact job performance across government, semi-government, and private organizations, especially in developing nations. To address these gaps, the study has formulated the following key research questions (RQ):

**RQ<sub>1</sub>:** *How do job engagement and job satisfaction both mediate the relationship between hygiene factors (based on Herzberg Theory) and job performance across organizations in developing countries?*

**RQ<sub>2</sub>:** *Does abusive supervision significantly moderate the relationship between job engagement and job performance?*

**RQ<sub>3</sub>:** *Does abusive supervision significantly moderate the relationship between job satisfaction and job performance?*

Our studies aim to investigate the dual mediation effect of job engagement and satisfaction on the relationship between hygiene factors and job performance. Additionally, we will investigate how abusive supervision influences the relationship between job performance, job satisfaction, and job engagement. This study makes some contributions. Firstly, it will investigate the impacts of hygiene factors on job engagement and satisfaction, which ultimately enhance job performance in developing countries like Bangladesh. Secondly, this study also investigates the dual mediation effects of job engagement and satisfaction on the relationship between hygiene factors and job performance. Thirdly, we will investigate the moderating impact of abusive supervision on the link between job engagement, job satisfaction, and job performance. Bangladesh, a developing nation with a dynamic organizational landscape where hierarchical structures, cultural norms, and limited resources greatly influence employee experiences, is the focus of this study. In semi-government and private organizations, hygiene factors have a strong impact on job satisfaction, while cultural respect for authority exacerbates the effects of abusive supervision. By analyzing these subtleties, the study provides insightful information about the relationships between engagement, satisfaction, and supervision, contributing to both academic and practical understanding.

Our study utilizes a survey methodology involving 410 participants from various sectors, including Bangladesh's private, government, and semi-government organizations. Data were gathered through a questionnaire-based survey and analyzed using structural equation modeling (SEM). The paper details the research model, hypotheses, and data analysis methods and presents the findings. It also acknowledges the study's limitations and proposes directions for future research. This research explores the independent and sequential mediation and moderation effects among the variables. By shedding light on the complex relationship among these variables, the study aims to enrich existing literature and provide actionable insights for organizational leaders, policymakers, managers, and scholars. These insights can enhance employee engagement, satisfaction, and overall performance, improving public services and economic development.

## 2. Literature review and hypotheses

### 2.1. Herzberg's two-factor theory and social exchange theory

Researchers have explored various theories in recent decades to understand human motivation, particularly in the workplace (Lee et al., 2023; Ann & Blum, 2020). These theories often focus on the role of needs in driving motivation (Mardanov, 2020). One notable theory is Herzberg's Two-Factor Theory, introduced by Frederick Herzberg in 1959 (Lee et al., 2023). This theory posits that job satisfaction and dissatisfaction are influenced by motivation and hygiene (Herzberg, 1965). Through an in-depth analysis, Herzberg identified that motivator factors lead to positive job attitudes and proper workplace performance (Herzberg, 1965). This study extends Herzberg's Two-Factor Theory within government, semi-government, and private organizations in developing countries like Bangladesh. Herzberg's theory distinguishes between hygiene factors (e.g., policies, working conditions, and relationships) and motivation factors (e.g., recognition, achievement), independently affecting job satisfaction and dissatisfaction (Kumar et al., 2018). The research model investigates the direct impact of hygiene factors on job satisfaction and performance, validating Herzberg's assertion that these factors prevent dissatisfaction (Ann & Blum, 2020). It also examines motivation factors, specifically job engagement, which includes emotional, cognitive, and physical dedication, as key drivers of satisfaction and performance (Lee et al., 2023). Additionally, the study introduces abusive supervision as a moderating factor, revealing how negative supervisory behavior can diminish the positive effects of hygiene and motivation factors. By exploring the mediating roles of job engagement and satisfaction, the model highlights mechanisms through which these factors influence job performance. Applying Herzberg's theory in this context provides empirical evidence of its relevance across different socio-economic and cultural settings, reinforcing or suggesting modifications to its universal applicability. This comprehensive approach enhances the understanding of job performance dynamics in various organizational contexts, building on and enriching Herzberg's original propositions.

Abusive supervision can be quantified using Social Exchange Theory (SET), which looks at the mutual interaction between managers and staff. Positive contacts result in mutual benefits, but adverse interactions (such as abusive supervision) upset this equilibrium (Dhali et al., 2023). SET holds that relationships are built on the exchange of resources. The aggressive behavior of the supervisor creates an imbalance, which makes employees feel undervalued and may cause them to react negatively or disengage (Fischer et al., 2021). Abusive supervision is viewed as a type of negative interaction (Dhali et al., 2023). According to this view, abusive supervision undermines trust and commitment among staff members, which in turn impairs organizational loyalty and performance (Islam et al., 2024). Employees may also respond to perceived injustice or abuse by reducing their participation or withholding effort (Fischer et al., 2021). As a result, SET emphasizes how abusive supervision damages the exchange relationship and results in poor job performance.

### 2.2. Theoretical framework

This study applies Herzberg's two-factor theory and social exchange theory (SET) to construct a model that identifies job performance's cognitive and motivational determinants and the negative impact of

abusive supervision. It seeks to offer insights for improving job engagement, satisfaction, and performance in developing countries by exploring relationships among key variables, such as job engagement and abusive supervision. Herzberg's Two-Factor Theory distinguished between hygiene factors, which reduce unhappiness, and motivators, which increase engagement and satisfaction. These notions provide a foundation for hypotheses about the mediating roles of job engagement and pleasure in the link between hygiene characteristics and job performance. Specifically, hygiene factors (such as fair compensation and a positive work environment) reduce dissatisfaction while increasing engagement and satisfaction, which in turn improves job performance. Social Exchange Theory (SET) explains the relationship dynamics between employees and their bosses. According to SET, reciprocal exchanges build trust and commitment, which improves workplace outcomes. However, when abusive supervision occurs, this exchange degrades, eroding trust and reducing participation and happiness. Thus, abusive supervision is thought to influence the impacts of engagement and pleasure on job performance, weakening these linkages under such circumstances. Based on these arguments the hypothesized relationships among these critical variables are as follows (Figure 1).

### 2.3. Hypothesis formation

#### 2.3.1. Hygiene factor towards job performance

As outlined in Herzberg's two-factor theory, hygiene factors are crucial in preventing job dissatisfaction and ensuring a baseline level of employee satisfaction (Segbenya et al., 2022). These hygiene factors include organizational policies, working conditions, salary, interpersonal relationships, and job security. While they may not directly lead to job satisfaction or motivation, their absence can cause significant dissatisfaction and reduced job performance (Demirci & Ergen, 2020). Transparent and fair organizational policies create a structured environment where employees understand their roles and responsibilities, reducing confusion and enhancing efficiency (Baeriswyl et al., 2016). Supportive policies like flexible working hours, health benefits, and professional development opportunities boost job satisfaction and productivity (Grobelna et al., 2016). Safe and comfortable working conditions, competitive salaries, and positive interpersonal relationships foster a collaborative and motivated work environment (Paek, 2022). Job security provides stability, encouraging employees to focus on their roles and perform effectively. Overall, hygiene factors are vital in creating a supportive work environment, preventing dissatisfaction,

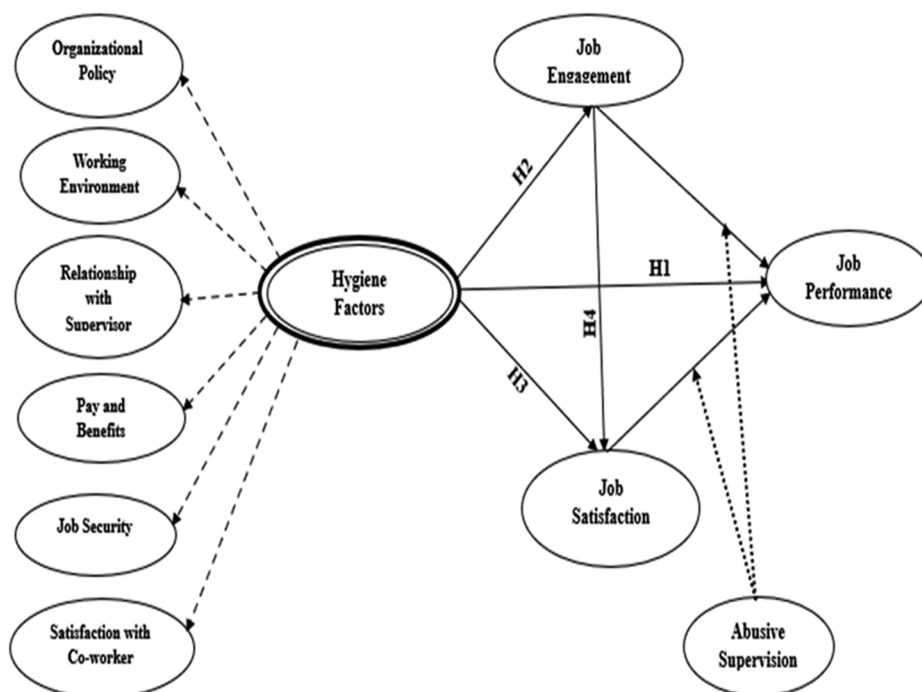


Figure 1. Conceptual framework.

and enhancing job performance. Moreover, according to Herzberg's two-factor theory, hygiene considerations are fundamental to meeting workers' basic requirements and fostering a sense of security that enables them to concentrate on their duties (Herzberg, 1965). This has a particularly significant effect in developing nations, since these elements reduce outside pressures and foster psychological and financial stability, both of which enhance job performance. Additionally, the positive workplace environment made possible by hygienic considerations improves employee involvement and alignment with company goals, which boosts job performance. Therefore, we formulated the following hypothesis:

**H<sub>1</sub>:** *Hygiene factors (based on Herzberg theory) have a positive effect on job performance.*

### **2.3.2. Hygiene factor towards job engagement**

Per Herzberg's Two-Factor Theory, hygiene factors are essential for maintaining job satisfaction and preventing dissatisfaction (Ansong et al., 2024; Fareed & Jan, 2016). Though not directly motivational, they create a secure, valued, and supportive environment, fostering job engagement (Sobaih & Hasanein, 2020). Transparent policies clarify roles and reduce ambiguity, aiding focus and efficiency (Aziri, 2011). Policies supporting well-being, such as flexible hours and health benefits, enhance satisfaction and engagement (Tan & Waheed, 2011). A safe, comfortable work environment boosts morale and reduces absenteeism (Hernandez & Guarana, 2018). Access to necessary tools improves productivity. Competitive salaries mitigate financial stress, and benefits like healthcare and paid leave increase loyalty (Fareed & Jan, 2016). According to Herzberg's Two-Factor Theory, hygiene elements play a crucial role in determining attitudes at work by minimizing dissatisfaction and creating an atmosphere that encourages dedication from workers (Herzberg, 1965). These elements are crucial enhancers of job engagement, especially in developing nations where pay, job security, and good working conditions have a major impact on quality of life (Ann & Blum, 2020). Moreover, a safe and well-equipped workplace promotes psychological safety by enabling workers to focus entirely on their tasks, which encourages greater physical and emotional commitment (Sobaih & Hasanein, 2020). Furthermore, through responding to fundamental needs, hygiene elements reduce distractions and allow workers to concentrate on productive tasks, which increases job engagement overall (Paek, 2022). Therefore, hygienic considerations are a vital starting point for encouraging greater employee engagement. Therefore, we formulated the following hypothesis:

**H<sub>2</sub>:** *Hygiene factors (based on Herzberg Theory) have a positive effect on job engagement.*

### **2.3.3. Hygiene factor to job satisfaction**

Herzberg's (1965) two-factor theory identifies hygiene factors and motivators as key to job satisfaction. Hygiene factors include pay, norms, management, and the workplace. These elements enhance satisfaction in the public sector, sales, education, and tourism jobs (Valk & Yousif, 2023). Salary structures impact financial well-being and work-related expenses, influencing job satisfaction. Adequate pay boosts productivity and retention, while inadequate pay leads to dissatisfaction (Bryson et al., 2017). Companies promote work-life balance through telecommuting and flexible schedules. Alignment of organizational values with corporate culture fosters job security and satisfaction. Herzberg's Two-Factor Theory states that hygiene elements, which attend to workers' basic requirements, are crucial in determining job happiness (Herzberg, 1965). In addition to reducing discontent, elements like pay, job stability, and good working conditions give workers a basis for feeling safe and supported in their positions (Lee et al., 2023). Since satisfying these basic requirements promotes a sense of optimism and fulfillment, hygiene considerations go beyond Herzberg's framework to support employees' emotional stability and general well-being, which enhances job satisfaction as well (Ann & Blum, 2020). Furthermore, workers feel more committed to their companies when they are compensated fairly and work in a positive atmosphere, which raises job satisfaction even more (Abolnasser et al., 2023). When taken as a whole, these elements show how important hygiene is to generating a positive impact on job satisfaction. Therefore, we hypothesized the following relationship:

**H<sub>3</sub>:** *Hygiene factors (based on Herzberg theory) have a positive effect on job satisfaction.*

#### 2.3.4. Job engagement towards job satisfaction

Job engagement, encompassing emotional, cognitive, and physical commitment, is vital for job satisfaction (Ariely et al., 2009). Deeply engaged employees often experience positive feelings about their jobs, enhancing satisfaction. Emotional connection to work makes it meaningful and fulfilling, fostering job satisfaction. Strong relationships with colleagues and supervisors create a supportive environment, boosting emotional well-being and satisfaction (Putra et al., 2017). Cognitive engagement, through mental investment in tasks and opportunities for growth, leads to better performance and higher satisfaction (Brown et al., 2005). Physically engaged employees exert more effort, achieving better performance and personal satisfaction (Valk & Yousif, 2023). Autonomy and control over work increase engagement and satisfaction, as do recognition and fair compensation. The alignment of individual values with organizational goals also elevates engagement and satisfaction (Ansong et al., 2024; Fareed & Jan, 2016). Since job engagement gives workers a sense of purpose and emotional fulfillment, it has a positive impact on job satisfaction (Putra et al., 2017). People who are genuinely engaged in their work experience a sense of fulfillment and congruence with their duties, which increases job satisfaction. Engaged workers are also more likely to receive praise and have favorable encounters, which increases their level of satisfaction (Valk & Yousif, 2023). Thus, job engagement significantly influences overall job satisfaction and performance. Therefore, we hypothesized the following relationship:

**H<sub>4</sub>:** *Job engagement have a positive effect on job satisfaction*

#### 2.3.5. Job engagement towards job performance

Job engagement, encompassing emotional, cognitive, and physical commitment, is a crucial predictor of job performance (Aziri, 2011; Welbeck et al., 2025). Emotionally engaged employees show genuine passion and enthusiasm, driving them to exceed basic job requirements and produce high-quality, innovative outcomes (Sodiq et al., 2024; Tan & Waheed, 2011). Their strong connection to their work makes them more resilient and able to maintain performance under stress. Cognitive engagement means being fully absorbed in tasks, leading to fewer errors, better problem-solving, and effective decision-making (Ansong et al., 2024; Fareed & Jan, 2016). Physically engaged employees invest significant energy into their work, resulting in higher productivity and attention to detail (Valk & Yousif, 2023). Engaged employees also foster better relationships with colleagues, enhancing teamwork and overall performance. Autonomy, recognition, and alignment of personal and organizational goals further boost engagement, driving superior job performance. Emotionally as well as physically committed to their work, engaged individuals are more motivated to work harder, be creative, and produce excellent work (Aziri, 2011; Sodiq et al., 2024). Therefore, increased motivation and alignment with corporate objectives are fostered by job engagement, which has a beneficial impact on job performance. Furthermore, proactive problem-solving and teamwork are fostered by their close relationship to company objectives, guaranteeing that their contributions are significant and in line with strategic objectives (Valk & Yousif, 2023). Thus, in a variety of organizational contexts, enhanced job performance is largely driven by high job engagement. Therefore, we hypothesized the following relationship:

**H<sub>5</sub>:** *Job engagement have a positive effect on job performance*

#### 2.3.6. Job satisfaction and job performance

Job satisfaction significantly enhances emotional well-being, boosting overall happiness and reducing stress (Putra et al., 2017; Sodiq et al., 2024). Satisfied employees are more motivated and committed, resulting in higher enthusiasm and dedication, directly improving job performance (Ansong et al., 2024; Aziri, 2011). Content employees tend to be more productive and efficient, reducing turnover and absenteeism, thus ensuring a stable and experienced workforce that contributes to better organizational performance (Abolnasser et al., 2023; Welbeck et al., 2025). Higher job satisfaction is linked to superior work quality, as satisfied employees take pride in their tasks, strive for excellence, and produce fewer errors. Engaged employees, driven by job satisfaction, are more innovative, contributing to organizational progress. They also exhibit Organizational Citizenship Behaviors (OCBs), enhancing team dynamics and overall

effectiveness. Job satisfaction fosters a harmonious work environment, reducing conflicts and improving performance (Putra et al., 2017; Welbeck et al., 2025). It leads to more excellent employee retention, providing stability and continuity. Satisfied employees offer better customer service, increasing customer satisfaction and loyalty, which drives business growth. Moreover, job satisfaction has a favorable effect on job performance because it boosts both intrinsic motivation and organizational commitment (Ann & Blum, 2020). Satisfied employees are also more likely to stay committed to their organization, which reduces absenteeism and turnover rates (Valk & Yousif, 2023). This constant dedication enables them to contribute effectively. Therefore, we hypothesized the following relationship:

**H<sub>6</sub>:** *Job satisfaction have a positive effect on job performance*

### 2.3.7. Mediating effects

Job engagement involves enthusiasm, dedication, and immersion at work. In other words, they should work diligently with focus (Abolnasser et al., 2023). According to Herzberg's Two-Factor Theory, hygiene factors create a supportive work environment by meeting basic employee needs and reducing stress and confusion (Herzberg, 1965). Employees who feel secure and valued can engage more fully in their work, leading to higher job performance (Stankeviciute et al., 2024). Good hygiene factors, like safe working conditions and competitive salaries, allow employees to focus on their tasks, enhancing job engagement and performance (Valk & Yousif, 2023). Positive relationships with colleagues and supervisors foster a collaborative environment, boosting engagement and effectiveness (Mardanov, 2020). Employee performance and goals determine an organization's effectiveness. Management has always struggled with employee performance (Gazi et al., 2022). When studying organizational behavior, job performance and work happiness are key to success (Arif & MacNeil, 2022). Because satisfied employees outperform disappointed ones. Job satisfaction may improve performance since satisfied workers do outstanding work. Job satisfaction, a positive emotional state from job experiences, is influenced by hygiene factors like fair pay and sound conditions, reducing turnover and absenteeism (Stankeviciute et al., 2024). Satisfied employees are more motivated and committed, often exceeding their job requirements, which improves performance (Mardanov, 2020). They take pride in their work, leading to higher quality outputs (Sobaih & Hasanein, 2020). A positive work environment increases job satisfaction, fostering morale and performance. Satisfied employees are more innovative, contributing to improved processes and job performance. Job engagement and satisfaction mediate the relationship between hygiene factors and job performance. Effective management of hygiene factors leads to a supportive environment, enhancing engagement and satisfaction and improving focus, motivation, and innovation. Prioritizing these factors helps organizations achieve better performance and success. Therefore, we hypothesize the following relationship:

**H<sub>7</sub>:** *Job engagement mediates the relationship between hygiene factors and job performance*

**H<sub>8</sub>:** *Job satisfaction mediates the relationship between hygiene factors and job performance*

### 2.3.8. Moderating effects

"Abusive supervision" is the type of destructive leadership that is most researched, according to Tepper (2000; p. 178) as a subjective evaluation resting on "subordinates' perceptions of the extent to which supervisors engage in the sustained display of hostile verbal and nonverbal behaviors, excluding physical contact". When a supervisor consistently acts in a hostile manner against their subordinates, both verbally and nonverbally, it is referred to as abusive supervision (Dhali et al., 2023; Hussain et al., 2022). Invading someone's privacy, claiming credit for their work, making fun of them, and spreading stories are a few examples of this (Fischer et al., 2021). It is important to note that abusive supervision does not involve physical violence but can have significant negative impacts on employees' mental health, job satisfaction, job engagement, job performance and overall workplace atmosphere (Dhali et al., 2023; Fischer et al., 2021; Islam et al., 2024). Job engagement, involving emotional, cognitive, and physical commitment, typically boosts job performance through increased enthusiasm, focus, and

energy (Stankeviciute et al., 2024). However, abusive supervision can disrupt this positive relationship by eroding employees' emotional commitment, diminishing their passion and confidence, and leading to lower job performance (Islam et al., 2024). The stress and negativity from abusive supervision can make it difficult for employees to concentrate, reducing productivity and performance (Lim et al., 2020). Additionally, employees may need more motivation to put in extra effort, lowering performance levels.

Job satisfaction, reflecting contentment with compensation, work-life balance, and growth opportunities, usually correlates positively with job performance (Stankeviciute et al., 2024). Satisfied employees are more motivated and committed, producing high-quality work. However, abusive supervision can significantly reduce this motivation, overshadowing job satisfaction's positive aspects (Mardanov, 2020). It can increase stress and burnout, negating job satisfaction on performance. Employees facing abusive supervision may also experience decreased loyalty and commitment, reducing work quality and quantity. Organizations should understand the moderating effects of abusive supervision to enhance job performance through engagement and satisfaction (Malik et al., 2022). Leaders should implement training programs to promote positive leadership behaviors, establish support systems for affected employees, foster a culture prioritizing the well-being and zero tolerance for abuse, and regularly monitor supervisory practices (Fischer et al., 2021). Addressing abusive supervision allows organizations to leverage job engagement and satisfaction better, enhancing performance and long-term success. According to Social Exchange theory, abusive supervision undermines the reciprocal exchange of respect and trust between employees and supervisors, reducing engaged employees' capacity to transform their commitment into outstanding performance (Dhali et al., 2023). Additionally, abusive behavior undermines the perceived fairness of the exchange relationship, causing employees to disengage or limit their efforts without feeling satisfied (Malik et al., 2022). Furthermore, the emotional toll of abusive supervision undermines employees' ability to effectively use satisfaction or engagement, reducing their impact on job performance (Islam et al., 2024). Consequently, abusive supervision weakens the core concepts of trust and reciprocity, serving as a negative moderator in these essential workplace relationships. Therefore, we hypothesize the following relationship:

*H<sub>9</sub>: Abusive supervision moderates the relationship between job engagement and job performance*

*H<sub>10</sub>: Abusive supervision moderates the relationship between job satisfaction and job performance*

### 3. Methodology

#### 3.1. Research design

The survey questionnaire for the present research was created using a systematic, three-step process for ensuring its validity, clarity, and conformity with the study's goals. Step 1: Literature Review: An extensive assessment of the relevant literature served as the foundation for the survey's original development, guaranteeing the inclusion of important constructs related to the investigation of performance behaviors, job satisfaction, and hygienic aspects among government employees. Step 2: Focus Group and Refinement: The study questions were carefully chosen by a focus group consisting of three seasoned researchers who work for the government. Following the assessment, we improved the questionnaire's clarity by eliminating items that were not necessary. Step 3: Pilot Testing and Validation: To confirm the validity of the questions, we executed a pilot test with 35 randomly chosen samples prior to analysis. Our data is appropriate for additional investigation, as validated by the pilot test.

**Survey design:** The survey was divided into three parts: The initial part outlines the goals of the study and assures respondents that their answers will be kept confidentially and used exclusively for study; the second gathered demographic information; and the third evaluated the performance behaviors, job satisfaction, hygiene factors, and engagement of government employees. There were 50 questions total, with five questions for each of the ten first-order constructs. We eliminated two items—one from ABS and one from OP—for providing superfluous answers, keeping 48 items for further investigation (Appendix 1).

**Constructs and measurement scales:** To evaluate hygiene factors as a higher-order reflective construct, its six sub-dimensions are Organizational policy (for example, I am fully aware of my organization's mission), Working environment (My workplace has stability and safety), Supervisor relationships (My supervisor keeps his/her promises), Pay and Benefits (My pay is adequate for me), Job security (working here makes me feel secure) and Satisfaction with Coworkers (my coworkers are friendly and helpful) were adopted from earlier research (Alzubi et al., 2023, Sobaih & Hasanein, 2020). Job performance (I am competent to complete the necessary tasks) measures were drawn from Pradhan and Gupta (2021) and Ghazi et al. (2013) and Sobaih and Hasanein (2020), while Job satisfaction (Overall, with my work, I'm satisfied) and job engagement (I'm brimming with enthusiasm at work) were measured using scales from Agarwal and Avey (2020), Hussain et al. (2022) and Sobaih and Hasanein (2020). And lastly, we measure Abusive Supervision (My supervisor's abuse demotivates me to work Hard) from Fischer et al. (2021).

### **3.2. Data collection method**

We used a convenient sampling method to collect data from experienced government employees in full-government, semi-government, and statutory entities (Thant & Chang, 2021). In research with limited resources or time, convenience sampling is frequently more practical. Convenience sampling was suitable because of the exploratory nature of the study or its particular environment (such as an underdeveloped country like Bangladesh). A web-based survey, created with Google Forms, was distributed via Facebook, Messenger, WhatsApp, email, and other social media platforms from January to February 2024. Out of 421 collected surveys, no missing values were found. Using Kothari's (2004) finite population sample size formula with a 95% confidence level, 5% error term, and 0.5 standard deviation, we eliminated 11 outliers and invalid responses, retaining 410 valid responses for analysis.

### **3.3. Data analysis tools**

This study utilized Amos-24 software to perform Structural Equation Modeling (SEM) for analyzing the hypothetical pathways. Descriptive statistics and demographic information were presented using IBM SPSS Statistics 24. The SEM confirmed the validity of the hypothesized paths, while the measurement model was assessed for accuracy and data reliability.

### **3.4. Common method variance**

Harman's single-factor test was used to examine common method variance (CMV) (Podsakoff et al., 2003). CMV issues are identified if all items load onto a single component or if one factor accounts for more than 50% of the variance. The first component explains 39.27% of the variance, and few variables have an eigenvalue greater than 1, indicating no CMV issues (Podsakoff et al., 2003).

### **3.5. Items reliability**

Our sample of 410 respondents meets the fundamental requirements for statistical analysis. The validity of the survey findings for all dimensions was tested using Cronbach's alpha coefficient, yielding an excellent overall value of 0.948. Additionally, the Cronbach's alpha for other variables also showed outstanding results, indicating that the items were highly reliable for analysis (see Table 1).

### **3.6. Inter-item correlation matrix**

The inter-item correlation matrix in Table 2 demonstrates that all constructs are positively correlated, with varying degrees of strength. This indicates a well-designed survey with constructs that are related but distinct, supporting the reliability and validity of the data for further analysis (Appendix 3).

### 3.7. Ethics committee approval and informed consent

This study approval constituted ethical clearance by the School of Management Human Research Ethics Committee of Juijiang University, China. Written Informed consent was obtained from all participants to the collection, storage, and use of their given information for research purposes.

## 4. Analysis and results

### 4.1. Respondents profile

Table 3 shows that 57.6% of respondents were male and 42.4% female, with 53.4% being single and 46.6% married. The gender distribution (42.4% female, 57.6% male) may have an impact on how people feel about their jobs because research indicates that men and women may experience workplace dynamics in different ways. Moreover, given that 46.6% of respondents were married and 53.4% were single, it is conceivable that married people's balancing of extra duties may have an impact on their job satisfaction and engagement levels. Age distribution was 26.6% for 16–25, 27.8% for 26–35, 16.8% for 36–45, 20% for 46–55, and 8.8% for 56+. The way that younger respondents (16–25) approach job engagement may differ from that of older groups, which could have an effect on their perceptions of supervisory behavior and overall satisfaction levels. Education levels were 2.7% below SSC, 4.1% SSC, 17.6% HSC, 55.9% graduates, and 19.8% postgraduates. Since greater education levels are frequently associated with higher expectations of job duties and supervisor interactions, respondents' educational backgrounds—the majority of whom (54.9%) are graduates—may have an impact on their job engagement and satisfaction. Monthly income distribution was below 10000 TK (9%), 10000-20000 (11%), 20000-30000 (11.7%), 30000-40000 (20.7%), 40000-50000 (27.1%), and 50000+ TK (20.5%). Since income levels are frequently correlated with job motivation, the distribution of income, with a sizable fraction earning above 40,000 TK each month, may have an impact on job satisfaction and engagement. Employment was 40.7% in the entire government, 31.5% in the semi-government, and 27.8% in statutory institutions. Considering these demographic variables helps the study understand how job engagement and satisfaction are influenced and how abusive supervision moderates these factors to impact performance. As organizational cultures

**Table 1.** Reliability.

	Reliability test	
	Cronbach's alpha	Items
Overall model	0.948	48
OP	0.926	4
WC	0.928	5
RWS	0.939	5
PAB	0.941	5
JSC	0.935	5
SWC	0.945	5
ABS	0.948	4
JE	0.950	5
JS	0.941	5
JP	0.937	5

Cutoff Area =  $\alpha > 0.70$

**Table 2.** Correlation matrix.

	Inter-item correlation matrix									
	OP	WE	RWS	PAB	JSC	SWC	JE	JS	JP	ABS
OP	<b>1.000</b>	0.483	0.502	0.497	0.499	0.515	0.433	0.467	0.373	0.431
WE	0.483	<b>1.000</b>	0.506	0.504	0.526	0.507	0.451	0.481	0.407	0.398
RWS	0.502	0.506	<b>1.000</b>	0.566	0.569	0.561	0.487	0.508	0.446	0.455
PAB	0.497	0.504	0.566	<b>1.000</b>	0.572	0.565	0.494	0.511	0.448	0.516
JSC	0.499	0.526	0.569	0.572	<b>1.000</b>	0.560	0.493	0.521	0.466	0.476
SWC	0.515	0.507	0.561	0.565	0.560	<b>1.000</b>	0.501	0.527	0.456	0.520
JE	0.433	0.451	0.487	0.494	0.493	0.501	<b>1.000</b>	0.566	0.515	0.447
JS	0.467	0.481	0.508	0.511	0.521	0.527	0.566	<b>1.000</b>	0.557	0.491
JP	0.373	0.407	0.446	0.448	0.466	0.456	0.515	0.557	<b>1.000</b>	0.498
ABS	0.431	0.398	0.455	0.516	0.476	0.520	0.447	0.491	0.498	<b>1.000</b>

**Table 3.** Respondent's profile.

		Respondent's profile	
Demographics (total = 410)		Frequency	%
Gender	Male	236	57.6
	Female	174	42.4
Marital status	Single	219	53.4
	Married	191	46.6
Age	16–25	109	26.6
	26–35	114	27.8
	36–45	69	16.8
	46–55	82	20.0
	56+	36	8.8
Level of education	Below SSC	11	2.7
	SSC	17	4.1
	HSC	72	17.6
	Graduate	229	55.9
	Post Graduate	81	19.8
Monthly income	Below 10000	37	9.0
	10000-20000	45	11.0
	20000-30000	48	11.7
	30000-40000	85	20.7
	40000-50000	111	27.1
Occupation institute	50000+	84	20.5
	Government job	167	40.7
	Private job	129	31.5
	Statutory	114	27.8
Authors calculation			

differ among government, semi-government, and statutory entities, the allocation among different sectors may influence how employees react to abusive supervision and how engaged they are at work overall. Based on individual origins and organizational settings, these demographic insights offer context for how job satisfaction and engagement may differ among groups and how performance may be impacted differently by abusive supervision.

#### 4.2. Descriptive Statistics & exploratory Factor analysis (EFA)

After excluding missing and duplicate data, 410 responses were analyzed. Here, Table 4 shows all items' mean, standard deviation, skewness, kurtosis, alpha values, and factor loadings. The mean values indicate general agreement with the study items, suggesting positive participant responses to the factors being measured in this research (Appendix 2). Skewness and kurtosis values, within the normal range of  $\pm 2.58$ , confirm data normality, showing that the data were collected properly. Cronbach's alpha and factor loadings indicate high internal consistency for all constructs for this study. The last column of Table 4 presents the results of the EFA conducted through principal component analysis. The suitability of the data for factor analysis was evaluated by analyzing the correlation matrix, which showed adequate correlations between the measurements. According to Vinzi et al. (2010), a factor loading cut-off of 0.707 is recommended, while Fornell and Larcker (1981) suggested a slightly lower cut-off of 0.70. Our measures exhibited factor loadings ranging from 0.700 to 0.999, which were statistically significant. Table 4's descriptive statistics give a summary of participants' answers to every item that was measured. A generally positive or neutral attitude toward the constructs evaluated is indicated by the mean values, which varied from 3.54 to 4.04. Higher mean values indicate agreement with items connected to hygiene variables to job performance. The comparatively lower standard deviations suggested that participant opinions were rather consistent across questions and that responses were not widely distributed. According to these descriptive insights, respondents' opinions about hygienic aspects, job satisfaction, job engagement, job performance, and the moderating influence of abusive supervision are often similar.

#### 4.3. Measurement model analysis

According to Farooq et al. (2018), the study indicated that Cronbach's alpha ( $\alpha > 0.70$ ) and CR  $> 0.70$  demonstrated satisfactory reliability. Factor loading ( $> 0.70$ ) and average variance extracted (AVE  $> 0.50$ )

**Table 4.** Descriptive statistics and loading.

Descriptive statistics and loading								
Item	Mean	Standard deviation	Skew	Kurtosis	Min	Max	$\alpha$	Loading
OP1	3.55	1.395	-0.778	-0.726	1	5	0.917	0.982
OP2	3.89	1.306	-0.978	-0.360	1	5		0.795
OP3	3.66	1.312	-0.884	-0.379	1	5		0.977
OP4	3.82	1.294	-0.893	-0.427	1	5		0.798
WE1	3.69	1.354	-0.957	-0.319	1	5	0.928	0.918
WE2	4.03	1.083	-1.009	0.024	1	5		0.856
WE3	3.72	1.313	-0.976	-0.210	1	5		0.949
WE4	4.04	1.168	-1.125	0.129	1	5		0.806
WE5	3.70	1.376	-0.994	-0.285	1	5		0.923
RWS1	3.78	1.321	-1.015	-0.180	1	5	0.938	0.984
RWS2	3.82	1.196	-0.875	-0.261	1	5		0.737
RWS3	3.77	1.345	-1.040	-0.164	1	5		0.971
RWS4	3.81	1.249	-0.971	-0.156	1	5		0.700
RWS5	3.78	1.328	-0.979	-0.249	1	5		0.997
PAB1	3.74	1.328	-1.036	-0.131	1	5	0.941	0.990
PAB2	3.91	1.253	-1.029	-0.139	1	5		0.700
PAB3	3.71	1.363	-1.011	-0.226	1	5		0.970
PAB4	3.90	1.189	-0.881	-0.367	1	5		0.728
PAB5	3.76	1.339	-1.008	-0.211	1	5		0.984
JSC1	3.81	1.296	-1.091	0.093	1	5	0.932	0.982
JSC2	3.87	1.236	-1.067	0.042	1	5		0.700
JSC3	3.80	1.316	-1.026	-0.122	1	5		0.995
JSC4	3.87	1.214	-0.965	-0.162	1	5		0.726
JSC5	3.75	1.345	-1.003	-0.209	1	5		0.999
SWC1	3.71	1.430	-0.966	-0.460	1	5	0.944	0.966
SWC2	3.89	1.190	-0.867	-0.424	1	5		0.744
SWC3	3.72	1.368	-1.000	-0.288	1	5		0.984
SWC4	3.85	1.260	-0.924	-0.326	1	5		0.724
SWC5	3.70	1.379	-1.011	-0.295	1	5		0.983
JE1	3.69	1.416	-0.853	-0.648	1	5	0.948	0.992
JE2	3.75	1.262	-0.809	-0.575	1	5		0.741
JE3	3.66	1.469	-0.880	-0.696	1	5		0.976
JE4	3.72	1.289	-0.796	-0.614	1	5		0.733
JE5	3.70	1.418	-0.912	-0.570	1	5		0.991
JS1	3.71	1.439	-0.942	-0.547	1	5	0.949	0.991
JS2	3.83	1.239	-0.927	-0.304	1	5		0.746
JS3	3.70	1.452	-0.964	-0.497	0	5		0.992
JS4	3.82	1.233	-0.851	-0.490	1	5		0.760
JS5	3.69	1.400	-0.935	-0.486	1	5		0.993
JP1	3.62	1.465	-0.839	-0.749	1	5	0.940	0.979
JP2	3.68	1.326	-0.675	-0.902	1	5		0.774
JP3	3.65	1.427	-0.825	-0.721	1	5		0.972
JP4	3.66	1.312	-0.635	-0.933	1	5		0.735
JP5	3.60	1.536	-0.776	-0.965	1	5		0.994
ABS1	3.54	1.465	-0.785	-0.842	1	5	0.938	0.968
ABS2	3.80	1.267	-0.768	-0.746	1	5		0.860
ABS3	3.80	1.356	-0.893	-0.575	1	5		0.925
ABS4	3.58	1.402	-0.744	-0.818	1	5		0.940

Authors calculation

provide convergent validity (Fornell & Larcker, 1981; Gazi et al., 2025). When the maximum correlation value is less than AVE squared (Appendix 2), discriminant validity is proven (Henseler et al., 2015). A threshold of 10 is used to test multi-collinearity using the variance inflation factor (VIF). CFI, TLI, IFI (>0.90),  $\chi^2/df$  (>3), and RMSEA (<0.05) are often used measures to evaluate model fit (Hu & Bentler, 1999). All the measurement models' validity and reliability are shown in Tables 5–7, suggesting good outcomes. The first-order measurement model was accepted due to a strong level of fit as evidenced by the following values: CMIN/df = 2.723, CFI= 0.921, TLI= 0.913, IFI= 0.922, NFI= 0.882, RMSEA= 0.065, GFI= 0.783, and AGFI= 0.751. All of these fit indices fall within the acceptable range (Fornell & Larcker, 1981). Moreover, the summary statistics suggest that the measurement model is internally consistent, implying that it may have a significant impact on the variables that influence job performance (Figure 2).

Table 5 demonstrates that all estimates, standard errors, critical ratio values, probability levels, and Cronbach's alpha values affirm the reliability of the reflective constructs used in the model. Additionally, Cronbach's alpha values exceeding 0.7 for each variable indicate high reliability and credibility of the

data (Appendix 3). Furthermore, factor loadings are significant, with external loadings meeting the threshold of at least 0.5. Thus, it confirms internal solid consistency among all constructs, validating their intercorrelations.

Table 6 presents reliability and validity measures, demonstrating the distinctiveness of each construct. Discriminant validity is assessed using the Fornell-Larcker criterion, where diagonal values, bolded as the square root of AVE, surpass off-diagonal correlation coefficients. This indicates satisfactory discriminant validity. Hence, intercorrelations among all constructs are highly precise, affirming the validity of each construct.

Here, Figure 3 and Table 7 confirm the validity of the higher-order measurement model. The higher-order measurement model was accepted due to strong fit indices: CMIN/DF = 2.665, CFI = 0.922, TLI = 0.922, IFI = 0.916, NFI = 0.881, RMSEA = 0.064, GFI = 0.781, AGFI = 0.756. These indices align with acceptable standards (Fornell & Larcker, 1981), indicating internal consistency and potential impact on job performance variables.

**Table 5.** First-order measurement model Statistics.

First order measurement model statistics						
Variables	Items	Estimate	S. E.	T-value	p value	Cr. Alpha
Organizational policy	OP1	0.764				0.917
	OP2	0.925	0.057	19.929	***	
	OP3	0.769	0.043	22.118	***	
	OP4	0.895	0.056	19.377	***	
Working environment	WE1	0.905	0.036	28.615	***	0.928
	WE2	0.770	0.038	16.166	***	
	WE3	0.905				
	WE4	0.804	0.036	22.071	***	
	WE5	0.913	0.036	29.211	***	
Relationship with supervisors	RWS1	0.926	0.031	32.007	***	0.938
	RWS2	0.744	0.037	19.567	***	
	RWS3	0.924	0.032	31.799	***	
	RWS4	0.772	0.038	20.953	***	
	RWS5	0.916				
Pay and benefits	PAB1	0.922				0.941
	PAB2	0.791	0.037	22.160	***	
	PAB3	0.928	0.032	32.773	***	
	PAB4	0.752	0.036	20.135	***	
	PAB5	0.916	0.032	31.566	***	
Job security	JSC1	0.883	0.037	25.931	***	0.932
	JSC2	0.801	0.039	21.347	***	
	JSC3	0.899	0.037	26.893	***	
	JSC4	0.758	0.040	19.344	***	
	JSC5	0.894				
Satisfaction with co-workers	SWC1	0.941	0.028	37.826	***	0.944
	SWC2	0.761	0.033	21.307	***	
	SWC3	0.941				
	SWC4	0.766	0.035	21.583	***	
	SWC5	0.932	0.027	36.474	***	
Job engagement	JE1	0.910				0.948
	JE2	0.793	0.035	22.034	***	
	JE3	0.943	0.032	33.515	***	
	JE4	0.792	0.036	21.996	***	
	JE5	0.938	0.031	33.032	***	
Job satisfaction	JS1	0.946	0.033	32.825	***	0.949
	JS2	0.791	0.036	21.627	***	
	JS3	0.947	0.033	32.906	***	
	JS4	0.802	0.035	22.208	***	
	JS5	0.901				
Job performance	JP1	0.916	0.031	30.777	***	0.940
	JP2	0.804	0.034	22.166	***	
	JP3	0.934	0.030	31.974	***	
	JP4	0.753	0.036	19.840	***	
	JP5	0.909				
Abusive supervision	ABS1	0.830				0.938
	ABS2	0.936	0.039	24.936	***	
	ABS3	0.943	0.042	25.196	***	
	ABS4	0.788	0.032	28.359	***	
Authors calculation						

**Table 6.** First-order construct validity.

	CR	AVE	MSV	MaxR	JP	JE	WE	JS	RWS	PAB	SWC	JSC	ABS	OP	VIF
JP	0.937	0.750	0.267	0.952	0.866										1.675
JE	0.944	0.771	0.261	0.959	0.510	0.878									1.808
WE	0.925	0.713	0.310	0.943	0.400	0.437	0.845								1.719
JS	0.945	0.774	0.267	0.961	0.516	0.511	0.482	0.880							1.994
RWS	0.934	0.740	0.300	0.952	0.396	0.424	0.462	0.469	0.860						1.960
PAB	0.936	0.748	0.285	0.952	0.433	0.446	0.484	0.478	0.512	0.865					1.973
SWC	0.940	0.761	0.300	0.961	0.403	0.412	0.514	0.508	0.547	0.531	0.872				1.991
JSC	0.928	0.721	0.294	0.937	0.442	0.474	0.524	0.486	0.540	0.534	0.506	0.849			2.013
ABS	0.930	0.769	0.268	0.950	0.502	0.454	0.425	0.474	0.446	0.518	0.496	0.498	0.877		
OP	0.906	0.708	0.310	0.927	0.438	0.446	0.557	0.501	0.540	0.514	0.545	0.542	0.483	0.841	1.673

Authors calculation

**Table 7.** Higher-order construct validity.

	CR	AVE	MSV	MaxR(H)	JP	JE	JS	ABS	Hygiene
JP	0.937	0.75	0.334	0.952	0.866				
JE	0.944	0.771	0.368	0.959	0.510	0.878			
JS	0.945	0.774	0.453	0.961	0.516	0.511	0.880		
ABS	0.93	0.769	0.438	0.95	0.502	0.455	0.475	0.877	
Hygiene	0.868	0.524	0.453	0.869	0.578	0.607	0.673	0.662	0.724

CMIN/df = 2.665, CFI = 0.922, TLI = 0.922, IFI = 0.916, NFI = 0.881, RMSEA = 0.064, GFI = 0.781, AGFI = 0.756

Authors calculation

Table 7 displays reliability and validity measures for the Higher-Order measurement model, confirming satisfactory discriminant validity. Therefore, the precise intercorrelations among all constructs affirm the validity of each one for this study.

#### 4.4. Structural model analysis

Based on the measurement model's fit, we conducted Structural Equation Modeling (SEM) (Figure 4) to evaluate the hypothesized paths. The explanatory power of a structural model is assessed by examining the structural paths and  $R^2$  scores of endogenous variables using AMOS analysis. The data revealed that the model explained the variance 37% of Job Engagement (JE), 47% of Job Satisfaction (JS), and 39% of Job Performance (JP). The model fit indices are  $X^2/df = 2.709$ ,  $GFI = 0.795$ ,  $AGFI = 0.769$ ,  $CFI = 0.926$ ,  $TLI = 0.921$ ,  $IFI = 0.926$ ,  $NFI = 0.888$ , and  $RMSEA = 0.065$ , all within acceptable ranges. Consequently, the structural model demonstrates a good fit. The relationships among all constructs were examined to validate the predicted conceptual model, as illustrated in Figure 4.

#### 4.5. Measuring hypotheses

Table 8 and Figure 4 show that higher fundamental values represent stronger correlations, while the absolute R-squared value indicates the model's strength. The Path Coefficients analysis offers insights into each structure's standardized coefficient, t-test, and p-values. Consequently, the results of the hypothesis tests are presented in Table 8.

The hypotheses were evaluated using a statistical technique on pooled data, with the results presented in Figure 4. The analysis revealed significant effects of hygiene factor ( $H_1$ ), job engagement ( $H_3$ ), and job satisfaction ( $H_6$ ) on job performance, which explained 39% of its variance. Moreover, significant effects of hygiene factor ( $H_3$ ) and job engagement ( $H_4$ ) on job satisfaction were found, explaining 47% of its variance. The hygiene factor ( $H_2$ ) on job engagement was found, explaining 37% of its variance. Therefore, all research hypotheses were positive and statistically significant (See Table 8). So, all hypotheses were strongly supported.

#### 4.6. Mediating effects

Bootstrapping was conducted by Baron and Kenny (1986) to assess mediating effects. Bootstrapping reveals the indirect impact of the independent variable through the mediator. Significant indirect effects occur when confidence intervals of indirect paths exclude zero (Nitzl et al., 2016). Table 9 confirms that all specific indirect effects are significant, meeting these criteria.

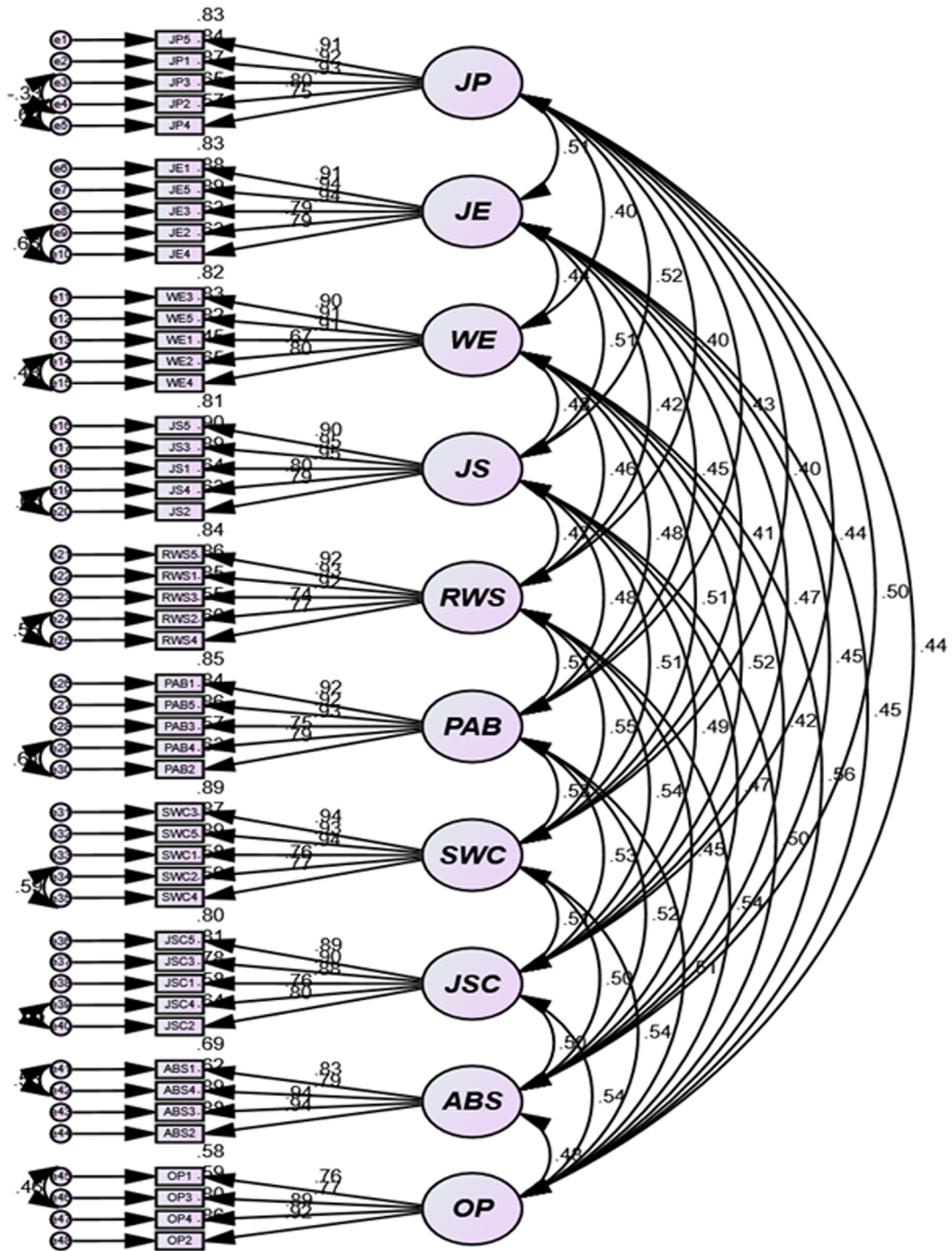


Figure 2. First order measurement model.

#### 4.7. Moderation analysis

Table 10 presents the results of the moderation analysis, showing how Abusive Supervision (ABS) influences the relationship between Job Engagement (JE) and Job Performance (JP) and between Job Satisfaction (JS) and Job Performance (JP). The results indicate that abusive supervision significantly moderates the relationships between job engagement and job performance, as well as job satisfaction and job performance.

Specifically, higher levels of abusive supervision reduce the positive impacts of both job engagement and job satisfaction on job performance. The estimates, t-values, and p-values all suggest that these moderating effects are statistically significant and moderately strong (Figures 5 and 6).

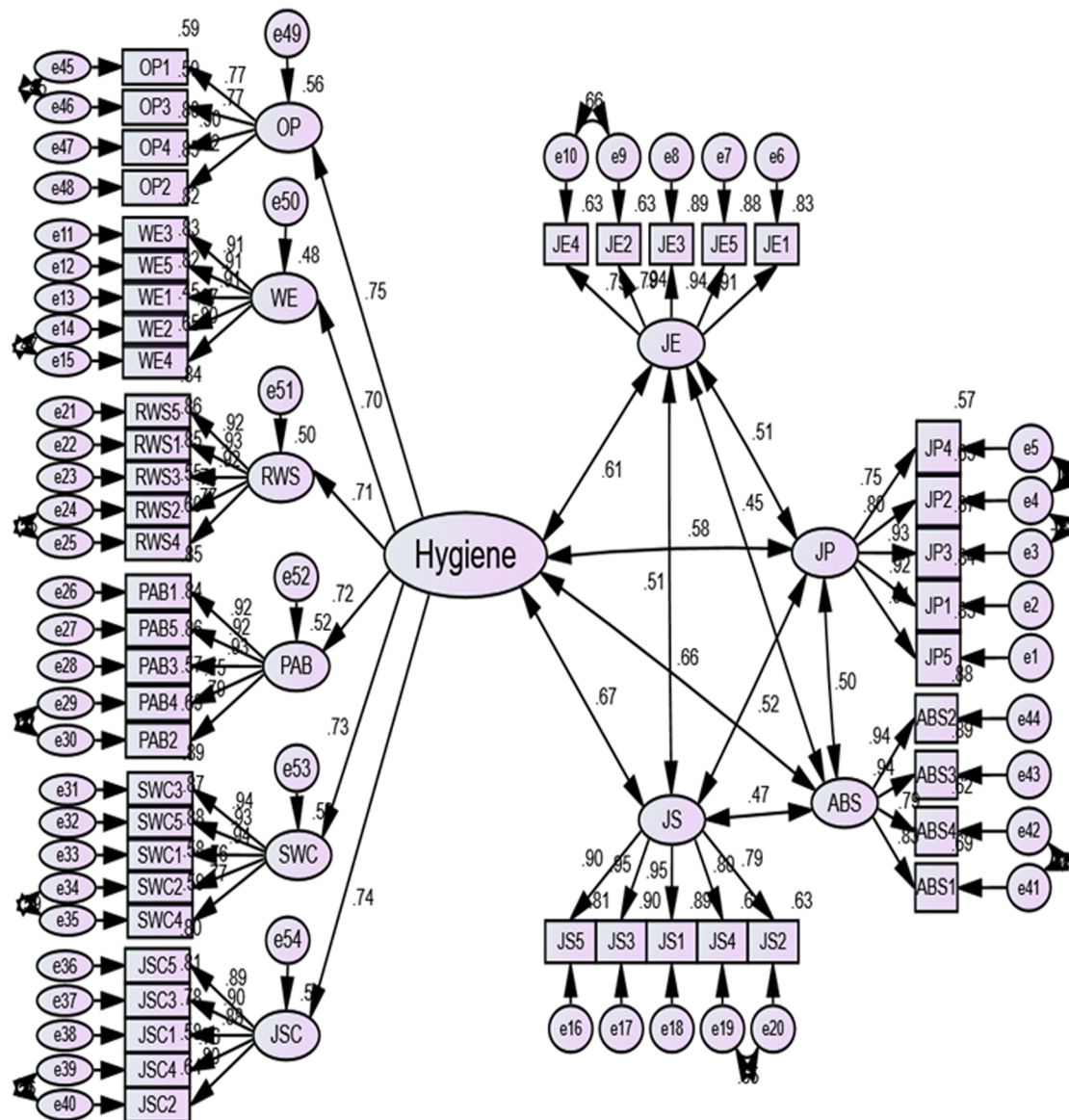


Figure 3. Higher order measurement model.

## 5. Discussion

The first and higher-order measurement model results confirm the reliability and validity of the constructs (see Tables 5 and 7). This study provides a thorough analysis of the interplay between hygiene factors, job satisfaction, job performance, abusive supervision, and job engagement. Six key components of hygiene factors are assessed using a second-order hierarchical model: organizational policy ( $\beta=0.75$ ), working environment ( $\beta=0.70$ ), supervisor relationships ( $\beta=0.71$ ), pay and benefits ( $\beta=0.71$ ), job security ( $\beta=0.74$ ), and co-worker satisfaction ( $\beta=0.73$ ). The results align with prior research (Lee et al., 2023; Sabeng & Mensah, 2023; Sobaih & Hasanein, 2020) and highlight organizational policy as the most critical dimension, indicating its importance in aligning with organizational missions, worker well-being, regular instruction on regulations, and supportive administration. However, organizational policy, working environment, supervisor relationships, and other variables are identified as indications of hygiene aspects in previous studies, but they are not treated as distinct dimensions within the concept of hygiene. This distinction is presented in our study as a new contribution. The findings further reinforce Herzberg's Two-Factor Theory by considering hygiene factors as a multifaceted framework with discrete, quantifiable components rather than as a single hidden concept. By validating six

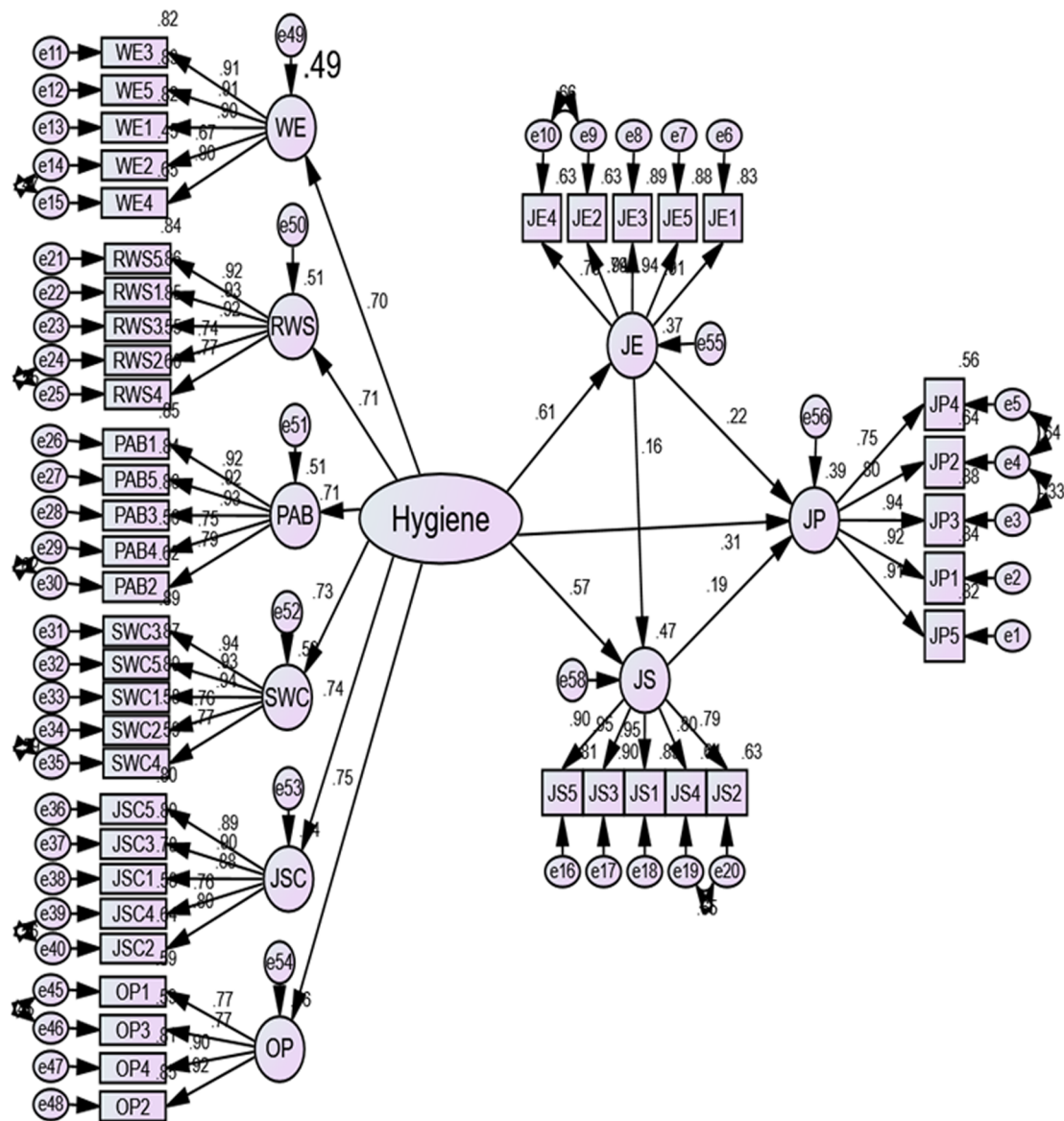


Figure 4. Structural equation model.

Table 8. Hypotheses results.

Results	Factors	Estimate	S.E	T value	p value	Hypothesis	Decision
Job engagement (JE) (R <sup>2</sup> =37%)	JE ← HF	0.607	0.092	10.223	***	H <sub>2</sub>	Accepted
Job satisfaction (JS) (R <sup>2</sup> =47%)	JS ← HF	0.574	0.101	8.573	***	H <sub>3</sub>	Accepted
	JS ← JE	0.163	0.053	3.019	0.003	H <sub>4</sub>	Accepted
Job performance (JP) (R <sup>2</sup> =39%)	JP ← HF	0.315	0.124	4.239	***	H <sub>1</sub>	Accepted
	JP ← JE	0.221	0.060	3.977	***	H <sub>5</sub>	Accepted
	JP ← JS	0.191	0.067	3.132	0.002	H <sub>6</sub>	Accepted

Notes:  $p > 0.05$  = not significant and \*\*\* or  $p < 0.05$  is accepted.

hierarchical levels, our study expands on Herzberg's initial theoretical framework by providing a more nuanced understanding of the ways in which various hygiene factors independently affect employee views.

According to Table 8, the hygiene factors positively and significantly impact job performance, aligning with previous studies (Ann & Blum, 2020; Paek, 2022; Segbenya et al., 2022; Welbeck et al., 2025). Thus, H<sub>1</sub> ( $\beta=0.315$ , T-value = 4.239,  $p < 0.05$ ) is supported. This finding suggests that

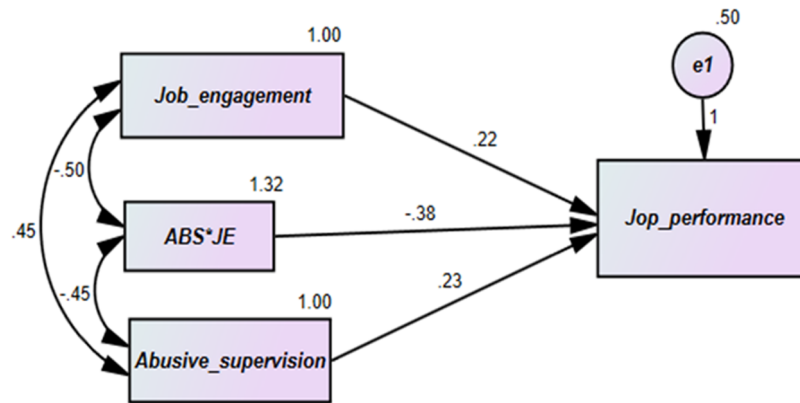
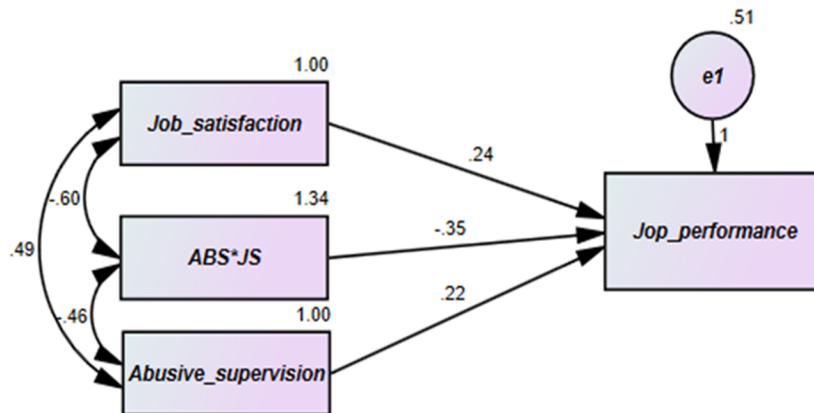
**Table 9.** Mediation result.

Variables	Estimate	Bootstrapping		
		Bias-corrected		
		95% CI		
		Lower	Upper	P
Indirect effect				
Hygiene Factors → JE → JP	0.165	0.079	0.283	0
Hygiene Factors → JS → JP	0.200	0.118	0.328	0

Notes:  $p < 0.05$  significant;  $p > 0.05$  insignificant; CI=Confidence Interval; the process repeated 5000 times.

**Table 10.** Moderation result.

Hypothesized path	Estimate	S.E.	t-value	p	Comment
JE*ABS→JP	-0.381	0.035	-10.958	***	Moderate
JS*ABS→JP	-0.348	0.036	-9.591	***	Moderate

**Figure 5.** Moderation model-1.**Figure 6.** Moderation model-2.

improvements in hygiene factors within the workplace are associated with enhanced job performance as measured in this study. This result validates Herzberg's theory that, while not directly reducing discontent, hygienic variables are important for performance and motivation in emerging nations. They establish the fundamental conditions required for the emergence of high performance when properly addressed.

Table 8 also reveals that job engagement significantly and positively affects hygiene factors, aligning with earlier research by Welbeck et al. (2025), Lee et al. (2023), Aziri (2011), Sobaih and Hasanein (2020). Therefore,  $H_2$  is supported ( $\beta = 0.607$ ,  $T\text{-value} = 10.22$ ,  $p < 0.05$ ). This finding suggests that effectively using hygiene factors in the workplace correlates with increased job engagement, as observed in this study.

Furthermore, Hypothesis 3 demonstrates that hygiene factors positively impact job satisfaction, consistent with previous research by Ansong et al. (2024), Sodiq et al. (2024), Bryson et al. (2017), Gazi et al. (2022). Thus,  $H_3$  is supported ( $\beta=0.574$ , T-value = 8.537,  $p<0.05$ ). This result indicates that effectively implementing hygiene factors in the workplace increases job satisfaction and job engagement. This highlights the importance of hygienic components in establishing the framework for the successful operation of intrinsic motivators, such as engagement and happiness, within the framework of Herzberg's theory.

Here,  $H_4$  ( $\beta=0.163$ , T-value = 3.019,  $p<0.05$ ) indicates a statistically significant relationship between job engagement and job satisfaction, as supported by previous studies Sodiq et al. (2024), Arif and MacNeil (2022), Putra et al. (2017). This suggests that feelings of enthusiasm, energy, focus, inspiration, satisfaction, ease, accomplishment, and honor associated with work significantly contribute to overall job satisfaction in this study. This mediating link is consistent with the Social Exchange Theory (SET), which holds that improved sanitary conditions and positive treatment are reciprocated by employees, leading to higher levels of engagement. Workers put greater effort and dedication into their jobs when they believe they are treated fairly and work in encouraging environments.

Moreover,  $H_5$  ( $\beta=0.221$ , T-value = 3.97,  $p<0.05$ ) is statistically supported, indicating a positive impact of job engagement on job performance, consistent with previous research (Abolnasser et al., 2023; Sobaih & Hasanein, 2020; Sodiq et al., 2024; Valk & Yousif, 2023). This finding suggests that work-related feelings of enthusiasm, energy, inspiration, accomplishment, and honor contribute significantly to overall job performance. These results are theoretically in line with SET, which holds that workers raise their performance in return when they feel appreciated and psychologically secure. In the setting of the public sector in developing nations, our findings offer concrete proof for this exchange mechanism.

Additionally,  $H_6$  ( $\beta=0.191$ , T-value = 3.13,  $p<0.05$ ) is statistically supported, indicating that job satisfaction positively impacts job performance, in line with previous research (Abolnasser et al., 2023; Ansong et al., 2024; Arif & MacNeil, 2022; Gazi et al., 2022; Nusraningrum et al., 2024). This finding suggests that overall job satisfaction enhances job performance. Employees who are satisfied with their work, happy with their workplace, and find their job beneficial and fulfilling are more likely to feel accomplished and honored. They tend to complete necessary tasks, adhere to job descriptions, meet performance benchmarks, complete work on time, and fulfil job responsibilities diligently. However, prior research has demonstrated these direct relationships in a variety of enterprises, including the manufacturing, service, and hospitality sectors, but they have overlooked investigating these relationships among public sector workers in developing nations, particularly Bangladesh. In this study, we assess how hygiene elements affect various government employees' job satisfaction, engagement, and performance in Bangladesh, which is another novelty of our study.

Table 9 highlights the mediating effects through confidence interval differences. The mediation results show that hygiene factors significantly impact job performance directly and indirectly through job engagement and satisfaction. Here, job engagement mediates the relationships between (1) hygiene factors and job performance ( $\beta=0.165$ ,  $p<0.05$ ), and also job satisfaction mediates the relationships between (2) hygiene factors and job performance ( $\beta=0.200$ ,  $p<0.05$ ). These findings highlight the importance of improving workplace hygiene factors (organizational policies, working environment, supervisor relationships, pay, job security, and coworker satisfaction) to boost employee engagement and satisfaction. By demonstrating that motivational (job engagement) and emotional (job pleasure) states function as reciprocal pathways for positive work environments, this dual mediation expands on SET. By illuminating several psychological processes by which reciprocal transactions materialize, this gives SET more depth. Our approach supports the simultaneous mediation of job satisfaction and engagement, which enhances the explanatory power of SET-in workplace behavior. Previous research has tended to examine these two concepts independently. Enhanced job engagement and satisfaction, driven by better hygiene factors, lead to improved job performance, benefiting the organization overall. The response to RQ1 was also disclosed here. Previous research examines this mediation independently. For example, Abawa and Obse (2024) only found a mediation impact for job satisfaction, and Sobaih and Hasanein (2020) only found a mediation effect for job engagement. However, they overlook demonstrating both of these mediation effects in a single research. As a further contribution, we demonstrated this dual mediation in our study. Our data show that hygiene factors, such as job stability and compensation, significantly improve job performance, in contrast to Aziz et al. (2024), who found no effect among faculty members in Pakistani

public-sector universities. This gap is most likely caused by contextual, methodological, and demographic variations. Our study looks at Bangladeshi public sector employees, where recent policy changes and reforms may have increased the relevance of these hygiene factors in improving job performance. Aziz et al. (2024) investigated Pakistani public universities, where bureaucratic frameworks and inflexible promotional systems might decrease the perceived impact of evaluation processes and opportunities for advancement. The difference could be explained by the cultural and organizational settings of the studies. Furthermore, Aziz et al. (2024) used 371 responses, concentrating on faculty members, while our study included a larger sample of public sector workers in a variety of departments and occupations, including a range of perspectives on hygiene variables. Moreover, our use of dual mediation and moderation analysis offers a more comprehensive knowledge of the ways in which hygiene factors influence engagement and job satisfaction to affect performance.

Table 10 shows the moderation analysis results, indicating that abusive supervision (ABS) affects the relationship between (1) job engagement and job performance ( $\beta = -0.381$ ,  $T = -10.958$ ,  $p < 0.05$ ) and (2) job satisfaction and job performance ( $\beta = -0.348$ ,  $T = -9.591$ ,  $p < 0.05$ ). The findings suggest that abusive supervision diminishes the positive impact of job engagement and job satisfaction on job performance. High job engagement and satisfaction contribute less to performance under abusive supervision. Organizations must minimize or eliminate abusive supervision to fully benefit from job engagement and satisfaction. Creating a supportive work environment with policies to prevent abuse is crucial. According to SET, abusive supervision undermines the psychological contract and sense of justice between managers and staff, which reduces the incentive to perform well in return, even in situations where engagement and satisfaction are high. By demonstrating how destructive leadership conduct disrupts the social exchange loop, this reinforces and expands on SET. Even without abusive supervision, enhancing engagement and satisfaction through recognition programs, professional development, and a positive culture is essential for improving job performance and achieving organizational success. Furthermore, this moderation effect answered the questions of RQ2 and RQ3. Although previous research shows that abusive supervision affects a number of variables and relationships (Fischer et al., 2021), little has been discovered about how it moderates the relationship between job satisfaction and job engagement on job performance. This relationship is significantly moderated by abusive supervision, as another novelty of our research. At the conclusion, our investigation provides significant novelty. Firstly, we found that hygiene factors beneficially impact employees' performance in the public sector of Bangladesh. Secondly, we are exploring the dual mediation effect of job engagement and job satisfaction on the relationship between hygiene factors and job performance. Lastly, we found the negative moderating effect of abusive supervision on the relation between job engagement and job satisfaction to job performance.

## 6. Conclusion

This study thoroughly examines the relationship between hygiene factors, job engagement, job satisfaction, job performance, and abusive supervision within the workplace. The results indicate that hygiene factors directly and indirectly affect job performance through job engagement and satisfaction. Additionally, abusive supervision moderates these relationships, diminishing the positive impacts of job engagement and satisfaction on performance. The study highlights the necessity of enhancing hygiene factors and minimizing abusive supervision to boost overall job performance. Using a sophisticated second-order hierarchical model, the research assesses six crucial dimensions of hygiene factors, which play a pivotal role in job engagement and job satisfaction in driving performance, while also pointing out the detrimental effects of abusive supervision on these relationships. These findings do have some limits, though, as with any research, and these are covered in more detail in Section 6.3. A reasonable evaluation of our contributions is offered by acknowledging these limits, which also points to areas that require further investigation. Organizations can significantly enhance employee performance and achieve tremendous success by addressing these key areas. This finding of the research can also provide useful insights for organizations that work in developing nations and is also invaluable for HR practitioners and organizational leaders striving to improve workplace conditions and employee outcomes. Organizations and policymakers in developing nations may be able to improve productivity as well as worker satisfaction by addressing key factors.

### **6.1. Theoretical implications**

This study contributes significantly to organizational behavior and HR management literature. First, it extends Herzberg's Hygiene Theory by empirically demonstrating hygiene factors' multidimensional and hierarchical nature, identifying six key dimensions (organizational policy, working environment, supervisor relationships, pay and benefits, job security, and coworker satisfaction). Second, it highlights the complex interplay between job engagement, job satisfaction, and performance, showing these as critical mediators. Third, the study reveals how abusive supervision undermines the positive impacts of engagement and satisfaction on performance, enriching theories on leadership and management. Employing a second-order hierarchical model also refines our understanding of hygiene factors' comprehensive impact. Overall, this study deepens theoretical insights into workplace factors influencing employee outcomes, emphasizing hygiene factors, engagement, satisfaction, and the adverse effects of abusive supervision.

### **6.2. Practical implications**

This study offers practical insights for enhancing job performance and employee well-being. Firstly, organizations should emphasize hygiene factors to increase employee engagement and satisfaction, improve organizational policies, create a supportive work environment, foster positive supervisor relationships, ensure fair pay and benefits, provide job security, and boost coworker satisfaction. Secondly, training and policies against abusive supervision should be implemented, and support systems like counseling should be offered. Thirdly, recognize and reward employees, offer career growth opportunities, and cultivate a positive culture. Fourthly, invest in leadership development and regularly monitor supervisor behavior. Lastly, the study adopts a holistic approach that integrates hygiene factors, engagement, and satisfaction to drive performance, creating a productive and motivated workforce. By implementing these, organizations can create a supportive and respectful work environment that maximizes employee engagement, satisfaction, and performance, ultimately leading to tremendous organizational success.

### **6.3. Limitations and future research**

This study has several limitations. First, the sample size and diversity might only partially capture the range of government employees in developing countries. Second, the study's reach may extend to only some government personnel, introducing selection bias. Third, convenience sampling might not accurately reflect the overall population, which might limit how broadly the results can be applied. This has an impact on how the results are interpreted and whether future studies using a more representative sampling technique could validate the findings. Fourth, self-report measures and a cross-sectional design may limit causal inferences and increase common method bias (CMB) in this study. In order to overcome this, we suggest that future studies use longitudinal designs and incorporate a variety of data sources in order to bolster causal findings and lessen the possibility of biases present in self-report data. Fifth, respondents may provide socially desirable answers or exaggerate their engagement and satisfaction, distorting self-reported data. Sixth, cultural, economic, and organizational differences may limit the applicability of the findings to all government employees in developing nations. Since the study was conducted in Bangladesh, its context may restrict generalizability. Finally, as a cross-sectional study, it may need to account for changes over time. Moreover, employee performance was chosen as the dependent variable in this study because it is relevant to organizational outcomes; nevertheless, attitudinal outcomes could offer a more profound theoretical understanding. Future studies could examine the relationship between hygienic characteristics and attitudinal variables like job participation or organizational commitment. Future research could examine additional moderators, such as organizational support or employee resilience, to better understand the impact of hygiene factors on job performance. Further studies should investigate government personnel's motivation through advancement, open communication, decision-making engagement, workplace autonomy, and recognition for exceptional performance. Moreover, in the future, we can investigate the mediated moderation effect, looking at how the dual mediation process might be impacted by the interplay of abusive supervision with other variables. A deeper understanding can also be gained from the serial mediation

effect of job satisfaction and engagement on the connection between hygiene factors and job performance.

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## Authors contribution

CRedit: **Md. Abu Issa Gazi**: Conceptualization, Data curation, Funding acquisition, Methodology, Project administration, Writing – original draft, Writing – review & editing; **Abdullah Al Masud**: Conceptualization, Methodology, Resources, Writing – original draft, Writing – review & editing; **Md. Emon**: Data curation, Investigation, Resources, Software, Writing – original draft; **Mohammad Bin Amin**: Data curation, Methodology, Resources, Software, Visualization, Writing – original draft; **Amani AbdAlatti**: Data curation, Funding acquisition, Resources, Visualization, Writing – review & editing; **Sukanta Biswas**: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Writing – original draft; **Abdul Rahman bin S Senathirajah**: Funding acquisition, Resources, Supervision, Validation, Visualization, Writing – review & editing; **Veronika Fenyves**: Funding acquisition, Investigation, Software, Validation, Writing – review & editing.

## Disclosure statement

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## About the authors

*Dr. Md. Abu Issa Gazi* is a Professor of Management at school of Management, Jiujiang University, China and Research Fellow at INTI International University and, in addition, Dr. Gazi is a Post-doctorate awardee from Universiti Malaysia Perlis, Malaysia. Prior to that, he worked as an Associate Professor, Assistant Professor, senior lecturer and lecturer at different Universities in China and Bangladesh. He has also successfully performed various administrative responsibilities. He received his PhD, MBA and BBA with outstanding performance in Management. Dr. Gazi is a confident in face of challenges diligent postgraduate faculty and having a strong critical thinking ability as an exceptionally talented researcher with greater insights, more perspectives and stronger research skills. He has great passion in teaching and research in the field of Business and Management. his research focuses on industrial workers' behavior, job satisfaction and job stress, international trade, Green human Resources Management, Green supply chain Management, Green CSR, Sustainability, entrepreneurship, e-commerce and broadly on the field of Business, economics and Management.

*Dr. Abdullah Al Masud* is an Associate Professor and Chairman of the Department of Management Studies at the University of Barishal, Bangladesh. With over 14 years of academic experience, he specializes in management, leadership, organizational behavior, sustainability, and CSR. A former Dean of the Faculty of Business Studies, he has published 95+ peer-reviewed articles in high-impact journals (WoS, Scopus, SSCI, ABS, ABDC) and received the University's Best Researcher Award in 2022 and 2023. Dr. Masud has industry experience with Bata Shoe Company and serves as Editor-in-Chief of the Barishal University Journal of Business Studies and a reviewer for top-tier journals.

*Md. Emon* is a graduate researcher in Management Studies at the University of Barishal, Bangladesh, holding both BBA and MBA degrees in management and HRM. His research focuses on management, sustainability, and human capital development. He has authored four peer-reviewed articles in prestigious journals indexed in WoS, Scopus, SSCI, ESCI, ABS, and ABDC, and has led several funded research projects. Emon is dedicated to producing impactful research that advances knowledge in Management, HRM, and Sustainability, especially in developing economies. His current work offers practical and theoretical insights for academics, practitioners, and policymakers committed to sustainable development.

*Mohammad Bin Amin* is a Doctoral Candidate in the Doctoral School of Management and Business, Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary. Along with his doctoral study, he is working

as an Associate Professor of the Department of Business Administration, Bangladesh Army University of Science and Technology, Saidpur, Bangladesh. His areas of research interest include management, human resource management, technology management, technology adaptation, leadership, corporate social responsibility, green management, circular economy, environmental economy, green supply chain management, sustainable performance, knowledge management, and renewable energy management. He can be reached at [binamindu@gmail.com](mailto:binamindu@gmail.com); [binaminbd@mail-box.unideb.hu](mailto:binaminbd@mail-box.unideb.hu).

**Amani AbdAlatti** is an Assistant Professor of Business Administration in the Administrative and Humanities Specializations Unit at the Applied College, King Khalid University. Her research interests include sustainability, organizational behavior, and GHRM.

**Sukanta Biswas** is a Lecturer in the Department of Management at Bajua Surendranath College, Khulna, Bangladesh. He completed his MBA in Human Resource Management from the University of Barisal, securing the first position in his department, and earned his BBA as faculty first, receiving the Dean's Award for academic excellence. Currently, he is pursuing an MPhil at the Institute of Business Administration (IBA), Jahangirnagar University. His research has been published in renowned journals such as *The International Journal of Information and Learning Technology* (Scopus-Q1) and *Cogent Social Sciences* (Scopus-Q2). His interests include HRM, GHRM, CSR, GCSR, Technology, Sustainability and Tourism.

**Dr. Abdul Rahman bin S Senathirajah**, a Professor at INTI International University, is a leading specialist in Quality Management Systems for education and industry. His expertise extends to roles as Senior Manager of Quality Assurance & Regulatory at Linton University College, and as Chief Editor of the *Asian Journal of Management, Engineering, and Technology* (AJMET). With a number of Scopus publications, he is also a certified ISO 9001:2015, ISO 14001:2015 auditor, Six Sigma Black Belt, and Business Process Reengineering trainer. His national contributions include designing Malaysia's MyKad and the E-Passport, and he is a recognized MQA Panel Member.

**Dr. Veronika Fenyves** is a University Professor and Dean of the Faculty of Economics and Business at the University of Debrecen, Hungary. Her research field includes economics, business, management, controlling, ESG, green finance, green technology, technology adaptation, digitalization in finance, technology management, entrepreneurship, and enterprise development. She can be reached at [fenyves.veronika@econ.unideb.hu](mailto:fenyves.veronika@econ.unideb.hu)

## ORCID

Md. Abu Issa Gazi  <http://orcid.org/0000-0002-1397-8855>  
 Abdullah Al Masud  <http://orcid.org/0000-0001-9345-4703>  
 Md. Emon  <http://orcid.org/0009-0004-9603-1764>  
 Mohammad Bin Amin  <http://orcid.org/0000-0002-9184-4828>  
 Amani AbdAlatti  <http://orcid.org/0009-0006-4424-5730>  
 Sukanta Biswas  <http://orcid.org/0000-0001-9886-0743>  
 Abdul Rahman bin S Senathirajah  <http://orcid.org/0000-0001-6044-9051>  
 Veronika Fenyves  <http://orcid.org/0000-0002-8737-0666>

## Data availability statement

The data presented in this study are available on request from the corresponding author.

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