

ORIGINAL RESEARCH ARTICLE

## From flexibility to fatigue: How job stress mediates the impact of mobile connectivity on burnout and engagement

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### ABSTRACT

**BACKGROUND AND OBJECTIVES:** The proliferation of smartphones has transformed the modern workplace, blurring boundaries between personal and professional life. While smartphone use facilitates flexibility and real-time communication, it can also intensify job demands and emotional strain. Despite extensive global research on technology-related stress, limited attention has been given to the mediating role of job stress in the relationship between workplace smartphone use and employee well-being in the Iranian context. This study addresses this gap by investigating how smartphone use affects job burnout and engagement through the mediating mechanism of job stress.

**METHODS:** This applied, quantitative research adopted a positivist paradigm and a deductive approach, utilizing a descriptive-survey design. Data were collected via an online questionnaire distributed among employees of Mobile Communication of Iran (Hamrah-e Aval), yielding 313 valid responses from a total population of 1,700. Standardized questionnaires adapted from established scales on smartphone use, stress, job burnout, and engagement were employed. The instruments were validated through back-translation and expert review, and reliability was confirmed using Cronbach's alpha coefficients (all above 0.70). Structural Equation Modeling with Smart Partial Least Squares 3 was employed for hypothesis testing.

**FINDINGS:** Findings reveal that smartphone use significantly increases job stress ( $\beta = 0.262, p < 0.001$ ). In turn, stress positively affects job burnout ( $\beta = 0.296, p < 0.001$ ) and negatively affects job engagement ( $\beta = -0.182, p < 0.001$ ). While smartphone use directly increases burnout ( $\beta = 0.168, p = 0.000$ ), it does not directly impact job engagement ( $\beta = 0.088, p = 0.290$ ). Mediation analysis confirmed that job stress partially mediates the relationship between smartphone use and both burnout and engagement.

**CONCLUSION:** Workplace smartphone use has a dual impact: it indirectly contributes to job burnout and disengagement via increased stress. These findings emphasize the importance of managing job stress to mitigate the negative psychological outcomes of ubiquitous mobile connectivity. Organizations should implement targeted interventions—such as flexible work policies, stress-reduction programs, and smartphone usage guidelines—to enhance employee well-being and performance in digitally connected environments.

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## INTRODUCTION

Job engagement is commonly conceptualized as a positive psychological state encompassing motivation, energy, and enthusiasm toward achieving work goals. It reflects an individual's full cognitive and emotional involvement in work tasks and a deep sense of commitment to their professional responsibilities. As defined (Kotzé and Nel, 2020), job engagement is characterized by vigor, dedication, and absorption—traits that enable individuals to effectively handle job demands while maintaining their psychological and physical well-being. Emotionally engaged employees not only derive personal satisfaction from their work but also feel strongly connected to their organization's success. Consequently, they are more likely to exceed expectations, contributing to increased productivity and reduced absenteeism (Whelan and Turel, 2024). The academic discourse on the relationship between job engagement and burnout presents two perspectives: some scholars treat them as opposites, while others view them as distinct yet negatively correlated constructs (Dunkl and Jiménez, 2017). Burnout, when present, significantly undermines both individual well-being and organizational performance, leading to higher absenteeism, reduced service quality, increased workplace accidents, and interpersonal conflicts. At a personal level, burnout manifests as emotional and physical exhaustion, often accompanied by anxiety, irritability, and even physical ailments such as insomnia, ulcers, and hypertension (Nematollahi et al., 2024; Abbasian and Nematollahi, 2024). Scholars describe burnout as a multidimensional response to chronic work stress, encompassing exhaustion, diminished achievement, and detachment from work. Research consistently highlights the strong positive link between job stress and burnout. Persistent stress undermines psychological resilience, causing employees to doubt the significance of their work and withdraw emotionally, which ultimately results in diminished engagement and well-being (Baek, Han, and Seepersad, 2022). Conversely, job engagement has been shown to buffer the effects of stress and promote adaptive coping strategies (Sasaki et al., 2021). Stress, broadly defined as a psychological response to misalignments between external demands and internal capacities, arises not only from excessive pressures but also from the underutilization of employees' skills and knowledge (Ehsan and

Ali, 2019). Furthermore, stress experienced in the workplace often spills over into personal life, disrupting work-life balance (Whelan and Turel, 2024). In today's digitally driven environments, the role of emerging technologies, especially smartphones, has become a central focus in understanding modern work stress (Yin et al., 2025; Pang and Liu, 2025; Dunkl and Jiménez, 2017). Smartphones have revolutionized the temporal and spatial boundaries of work, allowing employees to remain connected beyond standard working hours (Baek, Han, and Seepersad, 2022). While they enable flexible working and real-time communication, their omnipresence can also blur the lines between work and personal life, inducing stress and fatigue (Lee, Lee, and Kim, 2017). Moreover, using smartphones for personal tasks during work hours may further intensify work-related stress (Whelan and Turel, 2024). This paradoxical impact of smartphone use—enhancing productivity while simultaneously straining well-being—has drawn considerable scholarly attention. Although smartphones provide increased accessibility and operational flexibility, they often contribute to work overload, disrupt work-life balance, and trigger technostress, defined as the stress resulting from the use of Information and Communication Technology (ICT). Empirical evidence links technostress to negative psychological outcomes such as reduced job satisfaction, organizational commitment, and performance, and heightened burnout (Whelan and Turel, 2024). Job demands such as information overload and system complexity intensify stress, though employees with high technological self-efficacy may experience mitigated effects (Yen, 2024). Smartphones can also foster job engagement by promoting collaboration, responsiveness, and access to resources. However, heavy reliance on them makes it difficult for individuals to disengage mentally, fostering continuous connectivity and psychological strain (Gonçalves and Santos, 2022). While prior studies have explored elements of this dynamic, most have not holistically examined the interaction among all four critical variables—smartphone use, stress, burnout, and engagement. For instance, Küçükali et al., (2023) highlighted the role of organizational context in burnout, while Zhao and Yu (2023) linked social media usage to decreased job engagement. Obschonka et al. (2023) argued that applying the Job Demands–Resources (JD-R) framework could en-

hance engagement and prevent burnout. [Hetzel-Riggin et al., \(2020\)](#) further demonstrated that job engagement mediates the relationship between stress and burnout. However, despite these findings, key mechanisms—such as the specific pathways through which smartphone use induces burnout—remain underexplored ([Gonçalves and Santos, 2023](#)). This study addresses a significant research gap by simultaneously examining smartphone use, job stress, engagement, and burnout, using Mobile Communication of Iran (MCI) Hamrah-e Aval—a major telecom provider in Iran—as a case study. The company’s operational model, extensive reliance on mobile technologies, and recent reports of psychological strain, disengagement, and absenteeism make it an ideal context for such an investigation. While smartphones are widely used for both personal and professional purposes within this organization, findings from audits and employee evaluations suggest that overuse has adversely affected concentration, job motivation, and social interaction, ultimately leading to burnout and diminished performance. In summary, although the literature has extensively covered the separate impacts of technology, stress, and burnout, few studies have integrated all four constructs in a comprehensive model. This research aims to fill that theoretical and practical gap by investigating the mediating role of stress in the relationship between smartphone use and job engagement/burnout, providing targeted insights for enhancing employee well-being and organizational performance at MCI Hamrah-e Aval. Despite increasing global interest in the psychological consequences of workplace connectivity, the specific mediating mechanisms through which smartphone use impacts employee well-being have remained underexplored in the Iranian context. In particular, little is known about how job stress may transmit the effects of mobile connectivity into either burnout or engagement. This study aims to fill this gap by proposing and testing a stress-mediated model using empirical data from a large telecom company in Iran.

#### *Literature review*

##### *Smartphone and job stress*

In contemporary workplaces, smartphones have become essential tools for both business owners and their employees, with workers increasingly dependent on these devices to perform their daily tasks ([Nematollahi et al., 2024](#)). Given that smartphones are now

an inseparable part of everyday work life, it is crucial to explore how they are utilized during working hours and their connection to positive organizational outcomes ([Lin et al., 2017](#)). The widespread adoption of smartphones worldwide has profoundly influenced both personal and professional aspects of life ([Lin et al., 2017](#)). Existing research highlights various implications of smartphone use. For instance, [Kim and Heo \(2019\)](#) describe smartphones as an emerging technology that is rapidly becoming integral to daily life, with a growing global user base. Smartphones enable easy access to social media platforms, messaging services, the internet, and other functionalities. Moreover, they have swiftly supplanted personal computers for many routine work activities. However, excessive use of smartphones can have detrimental effects on individuals ([Kim and Heo, 2019](#)), including a range of psychological issues such as depression, reduced self-esteem, and notably, stress linked to overuse ([Elhai et al., 2017](#)). Work-related stress is defined as an adverse reaction to excessive pressures and demands encountered at work, which can make success seem unattainable and result in cognitive imbalance and distress in the workplace ([Nematollahi et al., 2024](#)). While everyone experiences stress to some extent, how individuals cope with stress critically influences their overall well-being ([Nematollahi et al., 2024](#)). Job stress is characterized as an unpleasant emotional state arising when job demands exceed an individual’s capacity to cope effectively. Thus, stress is a common phenomenon that impacts employees differently depending on specific work environments and conditions ([Ehsan and Ali, 2019](#)). Research findings on the consequences of smartphone use have been varied. [Elhai et al., \(2017\)](#) reported that smartphone use at work can increase stress levels, while [Brubaker and Beverly \(2020\)](#) found that excessive smartphone use correlates with elevated stress, poorer sleep quality, and greater burnout. Conversely, [Neştian, Tiță, and Turnea \(2020\)](#), in their study “Using Mobile Phones at Work,” identified that the primary benefit of using mobile phones for personal reasons at work is the enhancement of employee productivity by facilitating a balance between work and personal life. Hence, smartphone use may have diverse impacts on job-related stress. Based on the current literature, the first hypothesis is formulated to examine the relationship between smartphone use in the workplace and its influence on stress levels:

*H1: Using smartphones in the workplace has a positive effect on job stress.*

*Stress, job engagement, and job burnout*

Job engagement is crucial for both employees and organizations. Employees who are highly engaged with their work tend to feel committed, energized, and intrinsically motivated to grow and perform at their best, thereby becoming valuable contributors to organizational productivity and success (Van Laethem, Van Vianen, and Derks, 2018). Research indicates that individuals with high job engagement report better physical health, fulfillment of psychological needs, and greater job satisfaction and commitment compared to those with lower engagement levels (Borst, Kruijen, and Lako, 2019). Obschonka et al., (2023), in their study on job burnout and engagement within entrepreneurship, demonstrated that factors within the Job Demands-Resources (JD-R) model, including stress, can both increase and decrease job engagement. This supports the view that job engagement and burnout are inversely related (Obschonka et al., 2023). Similarly, Hetzel-Riggin et al., (2020) found that job engagement can mediate the relationship between work-related stress and job burnout. Their findings suggest that stress does not inevitably lead to burnout and that managing stress positively can enhance engagement. Gonçalves and Santos (2022) further found that compelled smartphone use can contribute to job burnout (Gonçalves and Santos, 2023). Elhai et al., (2017) reported that excessive use of new technologies, especially within work environments, may provoke psychological issues such as job-related stress. Moreover, increased job demands leading to burnout have been linked to higher turnover intentions among employees (Jamal et al., 2024).

New technologies have altered individuals' perceptions of time and space, often extending working hours beyond the traditional schedule and compelling employees to work at irregular times through smartphone use (Nematollahi et al., 2024). The advent of smartphones—a pivotal tool for teleworking—has enabled employees to work from any location and at any time, regardless of their preference (Ehsan and Ali, 2019). While smartphones enhance organizational performance by facilitating greater work access, their use outside of regular hours can generate positive emotions and reduce stress (Hetzel-Rig-

gin et al., 2020). From this standpoint, smartphones significantly support job engagement by improving communication and collaboration, enabling flexible work hours, and allowing continuous information exchange. Accordingly, based on the literature, the following hypothesis is proposed concerning the effects of workplace stress:

*H2: Stress mediates the effect of smartphone use on job engagement.*

Kotzé and Nel (2020) argue that smartphones paradoxically blur the boundaries between work and personal life, adversely impacting employee well-being and work-life balance, while increasing stress and burnout. These factors contribute to unfavorable workplace conditions. Often, such adverse conditions and unmet psychological needs negatively affect employee satisfaction and productivity. Consequently, burnout is recognized as a major psychosocial occupational risk in modern society, imposing substantial costs on both individuals and organizations (Epstein et al., 2020; Han et al., 2019). Initially considered prevalent mainly in professions involving interpersonal interactions, burnout has now been shown to affect diverse professions and job categories (Hewitt et al., 2020). Job burnout encompasses three key dimensions:

- *Emotional exhaustion, characterized by depletion of emotional resources and energy, lack of enthusiasm, frustration, tension, and fatigue.*
- *Depersonalization, involving the development of negative and indifferent attitudes toward clients, colleagues, or the organization, treating them impersonally.*
- *Reduced personal accomplishment, reflecting professionals diminished sense of fulfillment and satisfaction with their work performance (Gonçalves and Santos, 2020).*

These dimensions represent a response to prolonged work-related stress caused by factors such as workplace conflict, family challenges, role ambiguity, workload, and a hostile work environment. Given the numerous negative impacts of stress on workplaces, the study of work-related stress and coping mechanisms has expanded across disciplines. Among these stressors, technology-induced stress, or technostress, has gained considerable attention recently (Scanlan and Still, 2019). Brubaker and Beverly (2020) found that excessive smartphone use elevates stress

levels, which correlate with poorer sleep quality and increased burnout. Scanlan and Still (2019) also indicated that workplace stress may reduce job engagement while influencing employee participation. In their study on smartphone-based stress management among nurses in Vietnam, Sasaki *et al.* (2021) demonstrated that such interventions can enhance work engagement, though the effects were modest and short-lived. Despite being low-cost, smartphone-based stress management programs can positively influence employee engagement. Therefore, job burnout and engagement are considered mental states influenced by stress, which in turn can either hinder or enhance individual and organizational performance and productivity (Monfries, Sandhu, and Millar). However, the direction of these effects varies across different organizational contexts. Based on the existing literature, the following hypothesis is proposed regarding the impact of workplace stress:

*H3: Stress mediates the effect of smartphone use on job burnout.*

#### *Smartphone use, job burnout, and job engagement*

In modern workplaces, smartphones can enhance productivity and offer numerous benefits, but these advantages depend on their appropriate use (Panova and Carbonell, 2018). While smartphones have facilitated many positive outcomes across various contexts, their excessive use has introduced challenges that adversely impact individuals' mental health and work performance (Park, Kim, and Lee, 2020). Reflecting on these benefits and drawbacks, Van Laethem, Van Vianen, and Derks (2018) suggested that smartphone use at work can function either as a job demand or a job resource. Job demands and resources represent key job characteristics encompassing physical, mental, and organizational facets, requiring sustained effort or stable skills. For instance, smartphone use in the workplace may elevate employee stress by generating pressure and mental strain, which can reduce productivity and lead to physiological or psychological costs. Conversely, job resources are elements of a job that support goal achievement, alleviate job demands, and promote personal growth and development (Scanlan and Still, 2019). According to established definitions, job demands and resources strongly predict burnout and job engagement, respectively. Job engagement is understood as a positive, work-related psychological state

marked by vigor, dedication, and absorption (Yan *et al.*, 2021). Burnout, a multidimensional reaction to chronic workplace stress, is characterized by emotional exhaustion, depersonalization, and diminished personal accomplishment (Lepp, Li and Barkley, 2016; Jeong, Kim, Yum, and Hwang, 2016), and is linked to various negative effects on employees' physical and mental health (Elhai *et al.*, 2017). Therefore, when employees perceive access to smartphones as a job demand, it may be associated with increased workload and extended working hours. Consequently, frequent smartphone use might intensify employee burnout when it is experienced as a demand. Based on the existing literature addressing smartphone use in the workplace and its impact on burnout, the following hypothesis is proposed:

*H4: Smartphone use in the workplace affects job burnout positively.*

On the other hand, employees may experience smartphone access as a job resource and associate it with flexibility and increased independence when performing work tasks. In this context, frequent work-related smartphone use may increase employees' interest in performing their duties, ultimately increasing their job engagement (Van Laethem, Van Vianen, and Derks, 2018). Therefore, according to the available literature, the following hypothesis is proposed concerning the use of smartphones in the workplace and their effect on job engagement:

*H5: Smartphone use in the workplace negatively affects job engagement.*

Previous research indicates that smartphone use, particularly in the workplace, can influence individuals in various ways. Despite ongoing technological advancements and their impact on employee behavior over recent years, the specific effects of workplace smartphone use on job burnout and engagement remain underexplored both domestically and internationally. This reveals a notable theoretical gap, as well as conceptual ambiguities and complexities within the topic. Consequently, from a theoretical standpoint, it is essential to address this gap by investigating whether smartphone use at work influences job burnout and engagement. Furthermore, considering stress as a mediating factor in the relationship between smartphone use and these outcomes represents a novel contribution to

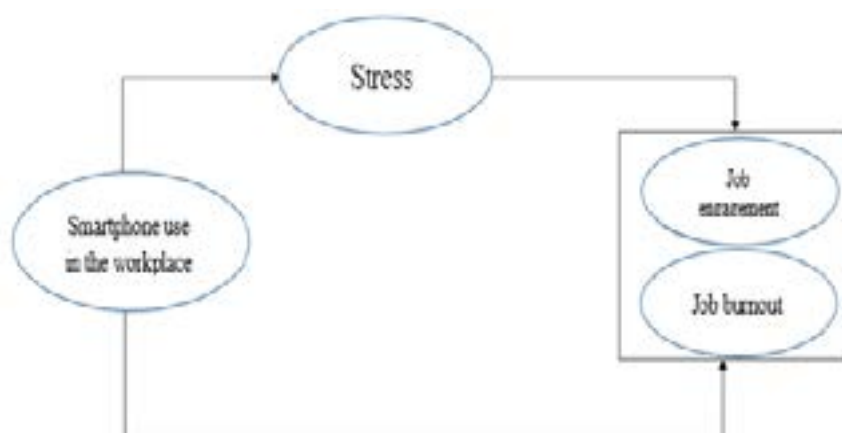


Fig. 1: Research conceptual model

the existing literature. Accordingly, grounded in the identified theoretical gap, the primary hypothesis of this study posits that stress mediates the impact of workplace smartphone use on job engagement and burnout. Moreover, the conceptual framework of this research is derived from integrating findings of two prior studies: [Gonçalves and Santos \(2022\)](#) and [Van Laethem, Van Vianen, and Derks \(2018\)](#), which separately examined the influence of smartphone use on job burnout and job engagement. To enhance the innovativeness of the model, stress is incorporated as a mediating variable, resulting in the conceptual framework illustrated below:

As illustrated in [Fig. 1](#), the conceptual model proposes that job stress mediates the relationship between smartphone use and two key outcomes: job burnout and job engagement.

## MATERIAL AND METHOD

According to the methodological framework outlined by [Saunders et al., \(2019\)](#), this study can be described as follows. From a purpose perspective, the research is applied, adopting a positivist philosophy and utilizing a comparative approach. Furthermore, since the study investigates and describes the status and relationships of variables through data gathered via an online questionnaire, it is classified as a descriptive survey employing a distinct quantitative method. The target population for this study consists of employees of MCI Hamrah-e Aval Co. Given that the researcher is a staff member of the company and has access to its data, the total population was identified as 1,700 individuals. Following coordination with the organization, the ques-

tionnaire was uploaded onto the company's internal portal, which is accessible to all employees at every level, facilitating easy participation. After distribution, a subset of completed questionnaires was selected as the sample from the population. Sampling was conducted based on Cochran's formula for finite populations, considering the specific size of the population. It is also important to mention that simple random sampling was employed, as detailed in the following formula:

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left[ \frac{z^2 pq}{d^2} - 1 \right]}$$

The total sample size was 313, which is an acceptable number for a society with 1700 members, according to Morgan's Table. In general, the data required in this research were collected using library and field methods. First, the research literature was collected using the available related sources and by reviewing the articles, documents, and books available in this field. In the next step, standard questionnaires were identified according to the research variables and distributed among the statistical population. The questionnaire stated in the article by [Park, Kim, and Lee \(2020\)](#) was used to investigate the use of smartphones in the workplace. Furthermore, the questionnaires stated in the articles by [Baek et al., \(2022\)](#) were used to investigate stress and job engagement, respectively. Finally, the questionnaire provided by [Baek, Han, and Seepersad \(2022\)](#) was used to examine job burnout. To improve transparency, the complete set of questionnaire items is provided below in [Table 1](#).

Table 1: The questionnaire used in the current research

| Variable                        | Question No.          | Questions                                                                                                        |
|---------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------|
| Demographics                    | 1                     | Gender (Male – Female)                                                                                           |
|                                 | 2                     | Age (20-25, 26-30, 31-35, 36-40, 41-45, 46-50, and >50 years)                                                    |
|                                 | 3                     | Education (Diploma, Associate degree: Bachelor's, Master's, and Ph.D. and higher)                                |
|                                 | 4                     | Marital Status (married – single)                                                                                |
|                                 | 5                     | Job Position (Expert – senior expert – manager)                                                                  |
|                                 | 6                     | Work Experience (<5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, and 26-30 years)                   |
| Smartphone use in the workplace | 7                     | These days, I often use my smartphone to address work-related issues, even after work.                           |
|                                 | 8                     | These days have to answer work-related text messages even in the evening.                                        |
|                                 | 9                     | These days, I have to check work-related text messages until I fall asleep.                                      |
|                                 | 10                    | When I get a message on my phone, I cannot resist checking it.                                                   |
| Stress                          | Organizational Stress | 11 Discrimination in the application of laws to different people has been a major concern for the past 6 months. |
|                                 |                       | 12 I have been stressed out by excessive administrative duties for the past 6 months.                            |
|                                 |                       | 13 Constant changes in policies and regulations have stressed me for the past 6 months.                          |
|                                 |                       | 14 I have been stressed out by the lack of staff for the past 6 months.                                          |
|                                 |                       | 15 I have been stressed out by overwhelming paper work for the past 6 months.                                    |
|                                 |                       | 16 The pressure on my free time has been stressful for the past 6 months.                                        |
|                                 |                       | 17 I have been stressed out by the lack of resources for the past 6 months.                                      |
|                                 |                       | 18 The uneven distribution of work responsibilities has been a stress for me for the past 6 months.              |
|                                 | Operational stress    | 19 Shift work has been stressful for the past 6 months.                                                          |
|                                 |                       | 20 Forced overtime has been stressful for the past 6 months.                                                     |
|                                 |                       | 21 The risk of injury at work has been a stress for me for the past 6 months.                                    |
|                                 |                       | 22 Traumatic events have been stressful for the past 6 months.                                                   |
|                                 |                       | 23 Personal life (outside work) management has been stressful for the past 6 months.                             |
|                                 |                       | 24 Work-related health and wellness issues have been stressful for the past 6 months.                            |
|                                 |                       | 25 Insufficient time to focus on adequate physical health has stressed me out for the past 6 months.             |
|                                 |                       | 26 People's negative comments have stressed me out for the past 6 months.                                        |
|                                 |                       | 27 The feeling that I am always at work has stressed me out for the past 6 months.                               |

|                |                          |    |                                                                                   |
|----------------|--------------------------|----|-----------------------------------------------------------------------------------|
| Job burnout    | Emotional exhaustion     | 28 | I feel emotionally drained at work.                                               |
|                |                          | 29 | I feel really exhausted from a lot of work at the end of the work day.            |
|                |                          | 30 | I already feel exhausted when I wake up in the morning and must work another day. |
|                |                          | 31 | Working with other people all day is really hard for me.                          |
|                |                          | 32 | I feel excessively exhausted from my work.                                        |
|                |                          | 33 | I feel hopeless in my job.                                                        |
|                |                          | 34 | I feel I am working hard (more than usual).                                       |
|                |                          | 35 | Working directly with others puts me at a lot of stress.                          |
|                | Depersonal-ization       | 36 | I feel that I treat some people as though they are not living beings.             |
|                |                          | 37 | Since I took this job, I have become more ruthless toward people.                 |
|                |                          | 38 | I worry my job will make me emotionally hardened and insensitive.                 |
|                |                          | 39 | I really don't care what happens to some community members.                       |
|                | Reduced personal success | 40 | I deal with other people's problems effectively.                                  |
|                |                          | 41 | I feel that through my work, I can make a positive impact on others' lives.       |
|                |                          | 42 | I feel enthusiastic.                                                              |
|                |                          | 43 | I can easily create a calm atmosphere.                                            |
|                |                          | 44 | I enjoy working closely with others.                                              |
|                |                          | 45 | I have carried out a lot of valuable work in this position.                       |
|                |                          | 46 | I deal with emotional issues in my work very calmly.                              |
| Job engagement | Happiness                | 47 | I am full of energy while working.                                                |
|                |                          | 48 | I feel strong and energetic while working.                                        |
|                |                          | 49 | I feel like going to work when I wake up in the morning.                          |
|                |                          | 50 | I can work for a long time without interruption.                                  |
|                |                          | 51 | I am mentally very flexible at work.                                              |
|                |                          | 52 | I always show perseverance in my work, even under unpleasant conditions.          |
|                | Sacrifice                | 53 | I consider what I do to be completely meaningful and purposeful.                  |
|                |                          | 54 | I do my job with great enthusiasm.                                                |
|                |                          | 55 | My job is inspiring.                                                              |
|                |                          | 56 | I am proud of what I have accomplished.                                           |
|                |                          | 57 | My job is challenging.                                                            |
|                | Attraction               | 58 | I feel that time passes quickly when I am working.                                |
|                |                          | 59 | I forget everything else when I am working.                                       |
|                |                          | 60 | I feel satisfied when I am working hard.                                          |
|                |                          | 61 | I get overwhelmed at work.                                                        |
|                |                          | 62 | When I am working, I forget about myself.                                         |
|                |                          | 63 | It's hard for me to leave my job.                                                 |

Table 2: Reliability by internal consistency method (Cronbach's alpha)

| Variables      | Cronbach's alpha |
|----------------|------------------|
| Smartphone use | 0.72             |
| Stress         | 0.76             |
| Job burnout    | 0.78             |
| Job engagement | 0.80             |

Table 3 presents the results of the demographic analysis. The sample size was 313.

Table 3: Demographic characteristics of the sample

| Variable        | Group             | Frequency | Percentage |
|-----------------|-------------------|-----------|------------|
| Gender          | Male              | 160       | 51.2       |
|                 | Female            | 153       | 48.8       |
| Marital status  | Married           | 180       | 57.5       |
|                 | Single            | 133       | 42.5       |
| Education       | Diploma           | 5         | 1.6        |
|                 | Bachelor's        | 60        | 19.2       |
|                 | Master's          | 210       | 67.3       |
|                 | Ph. D. and higher | 38        | 12.2       |
| Age             | 20-25             | 20        | 6.4        |
|                 | 26-30             | 60        | 19.3       |
|                 | 31-35             | 80        | 25.7       |
|                 | 36-40             | 82        | 26.3       |
|                 | 41-45             | 50        | 16.0       |
|                 | 46-50             | 14        | 4.5        |
|                 | >50               | 4         | 1.3        |
| Job position    | Expert            | 115       | 37.1       |
|                 | Senior expert     | 120       | 38.7       |
|                 | Manager           | 75        | 24.2       |
| Work experience | <5 years          | 65        | 20.9       |
|                 | 6-10 years        | 115       | 36.9       |
|                 | 11-15 years       | 53        | 17.0       |
|                 | 16-20 years       | 58        | 18.6       |
|                 | 21-25 years       | 17        | 5.5        |
|                 | 26-30 years       | 4         | 1.3        |

Table 4: Skewness and kurtosis values to evaluate the normality of the variables

| Variable                 | Skewness  |            |         | Kurtosis  |            |         |
|--------------------------|-----------|------------|---------|-----------|------------|---------|
|                          | Statistic | Std. Error | Z-Score | Statistic | Std. Error | Z-Score |
| Smartphone Use (Total)   | -0.35     | 0.138      | -2.54   | -0.65     | 0.275      | -2.36   |
| Organizational Stress    | 0.40      | 0.138      | 2.90    | -0.25     | 0.275      | -0.91   |
| Operational Stress       | 0.82      | 0.138      | 5.94    | 0.53      | 0.275      | 1.93    |
| Stress (Total)           | 0.65      | 0.138      | 4.71    | 0.38      | 0.275      | 2.06    |
| Happiness                | -0.50     | 0.138      | -3.62   | 0.10      | 0.275      | 0.36    |
| Sacrifice                | -0.85     | 0.138      | -6.16   | 1.75      | 0.275      | 6.36    |
| Attraction               | -0.70     | 0.138      | -5.07   | 0.22      | 0.275      | 0.80    |
| Job Engagement (Total)   | -0.80     | 0.138      | -5.80   | 0.68      | 0.275      | 2.47    |
| Emotional Exhaustion     | 0.22      | 0.138      | 1.59    | -0.40     | 0.275      | -1.45   |
| Depersonalization        | 0.60      | 0.138      | 4.35    | -0.30     | 0.275      | -1.09   |
| Reduced Personal Success | -0.38     | 0.138      | -2.75   | 0.05      | 0.275      | 0.18    |
| Job Burnout (Total)      | 0.15      | 0.138      | 1.09    | -0.55     | 0.275      | -2.00   |

All original questionnaires were translated into Persian and reviewed by two bilingual experts using the back-translation method to ensure linguistic equivalence. Content validity was verified through expert panel review, and a pilot test with 30 employees was conducted to ensure clarity and relevance. Minor modifications were made based on participant feedback before the final distribution. The data analysis was conducted using descriptive and inferential methods. Thus, the main and demographic variables were described at the descriptive level, and the validity and reliability of the questionnaire, the relationships among the variables, and the research model were examined at the inferential level. SPSS 27 and Smart PLS 3 software were also used for data analysis. The content of the data collection tool (questionnaire) was checked using the face validity method and the opinions of the researchers and experts. The questionnaire was distributed among the statistical population of the research after corrections were made by the professors and their final approval. The reliability of the questionnaire was also calculated using Cronbach's alpha, confirming the scale's reliability for values  $>0.7$ . Thus, after examining the Cronbach's alpha values of the main research variables, the results obtained are as described in Table 2. Cronbach's alpha of all variables was 0.7, confirming the questionnaire's reliability.

## RESULTS AND DISCUSSION

### *Normality of variables*

Table 4 examines the normality of the data distribution, which is the premise of Pearson's correlation parametric tests and structural equation modeling, using the covariance-based method (LISREL and Imus). Skewness and kurtosis were used to determine univariate normality, whereas multivariate normality was determined using Mardia's coefficient. If the Z-score is outside the absolute value of 1.96, there is a difference between the observed and normal distribution at the 95% confidence level, and the data are not normal. The results are shown in Table 4.

As shown in Table 4, the Z-scores for skewness exceeded the critical value of  $\pm 1.96$  in 9 variables, while kurtosis Z-scores exceeded this threshold in 4 variables. This indicates that several variables do not follow a normal distribution. Overall, most variables exhibited deviations from normality in terms of skewness, kurtosis, or both. Multivariate normality was assessed using Mardia's coefficient, which was found to be 8.51. According to Byrne (2010), this value exceeds the threshold of 5, confirming that the assumption of multivariate normality is violated. Given these results and the departure from normality shown in both univariate and multivariate assessments, the research model was analyzed using a variance-based approach with SmartPLS

Table 5: Correlation matrix between the main variables and divergent validity investigation using the Fornell–Larcker method

| Variables                   | 1      | 2       | 3       | 4       | 5       | 6      | 7      | 8      | 9    |
|-----------------------------|--------|---------|---------|---------|---------|--------|--------|--------|------|
| 1. Smartphone Use           | 0.79   |         |         |         |         |        |        |        |      |
| 2. Organizational Stress    | 0.22** | 0.66    |         |         |         |        |        |        |      |
| 3. Operational stress       | 0.23** | 0.54**  | 0.68    |         |         |        |        |        |      |
| 4. Emotional exhaustion     | -0.04  | 0.10    | 0.15**  | 0.67    |         |        |        |        |      |
| 5. Depersonalization        | 0.03   | 0.16**  | 0.31**  | 0.31**  | 0.69    |        |        |        |      |
| 6. Reduced personal success | 0.18** | 0.02    | 0.01    | -0.10   | -0.04   | 0.63   |        |        |      |
| 7. Happiness                | 0.15** | -0.15** | -0.18** | -0.08   | -0.15** | 0.38** | 0.69   |        |      |
| 8. Sacrifice                | 0.15** | -0.19** | -0.20** | -0.18** | -0.23** | 0.32** | 0.41** | 0.68   |      |
| 9. Attraction               | 0.11   | -0.25** | -0.22** | 0.07    | -0.01   | 0.14*  | 0.26*  | 0.21** | 0.60 |

\*\* =  $P \leq 0.05$  & \*\*\* =  $P \leq 0.01$

software, which is robust to violations of the multi-variate normality assumption.

#### Correlation of variables

Table 5 presents the relationship between the research variables using the correlation test and the divergent validity investigation using the Fornell–Larcker method. Divergent validity is acceptable when the AVE for each construct exceeds the shared variance between that construct and other constructs (i.e., the square of the correlation coefficients between constructs) in the model. Thus, the acceptable divergent validity of a measurement model indicates that a construct in the model interacts more with its indicators than with other constructs. According to the results in Table 5, the correlation between variables was less than the square root of the average variance extracted, thereby establishing divergent validity.

#### Confirmatory factor analysis

Using Smart PLS software, the validity of the questionnaire was investigated using factor loading and convergent validity indices, while the reliability of the variables was evaluated using composite reliability and Cronbach's alpha. Factor loadings were calculated considering the correlation value of the indicators of a construct with that construct. The minimum factor loading value was 0.40 in this research. The Average Variance Extracted (AVE) index was used to check the convergent validity. Generally, the AVE index was used to evaluate content validity. Cronbach's alpha was also used to measure reliability. The general rule is that the Cronbach's alpha value of a scale should be at least 0.70. This index measures the variance that

a latent variable derives from its indicators. Convergent validity assesses whether indicators of a particular construct contribute a high proportion of common convergent variance. The value of this index ranges from 0 to 1, with higher values indicating the convergent validity of the desired structure. The results of the confirmatory factor analysis in Table 6 are as follows. All factor loadings are significant at the 95% confidence level as follows: ( $p < 0.05$ ) and ( $t < 1.96$ )

Using SmartPLS software, the questionnaire's validity was evaluated through factor loadings and convergent validity indices, while reliability was assessed using composite reliability and Cronbach's alpha. Factor loadings were computed based on the correlation between each indicator and its respective construct. A minimum factor loading threshold of 0.40 was set for this study. The AVE was used to assess convergent validity, indicating the proportion of variance captured by the construct relative to measurement error. Cronbach's alpha measures internal consistency reliability, with values above 0.70 considered acceptable. The confirmatory factor analysis results presented in Table 6 show that all factor loadings exceeded the 0.40 cutoff and were significant at  $p < 0.05$ , confirming construct validity for all items. For Smartphone Use, composite reliability and Cronbach's alpha were 0.85 and 0.74, respectively, both exceeding the 0.70 benchmark, confirming reliability. For Organizational and Operational Stress components, composite reliability values of 0.85 and 0.86, and Cronbach's alphas of 0.78 and 0.80, respectively, indicate strong

Table 6: Results of confirmatory factor analysis: validity and reliability

| Component                   | Question | Factor Loading<br>(Std. Coeff.) | p-value | AVE  | Composite<br>Reliability | Cronbach's<br>Alpha |
|-----------------------------|----------|---------------------------------|---------|------|--------------------------|---------------------|
| Smartphone Use (Total)      | 7        | 0.75                            | 0.000   |      |                          |                     |
|                             | 8        | 0.88                            | 0.000   | 0.65 | 0.85                     | 0.74                |
|                             | 9        | 0.80                            | 0.000   |      |                          |                     |
| Organizational Stress       | 11       | 0.73                            | 0.000   |      |                          |                     |
|                             | 12       | 0.60                            | 0.000   | 0.46 | 0.85                     | 0.78                |
|                             | 13       | 0.69                            | 0.000   |      |                          |                     |
|                             | 16       | 0.75                            | 0.000   |      |                          |                     |
|                             | 17       | 0.58                            | 0.000   |      |                          |                     |
|                             | 18       | 0.74                            | 0.000   |      |                          |                     |
| Operational Stress          | 19       | 0.66                            | 0.000   |      |                          |                     |
|                             | 20       | 0.75                            | 0.000   | 0.48 | 0.86                     | 0.80                |
|                             | 21       | 0.81                            | 0.000   |      |                          |                     |
|                             | 22       | 0.76                            | 0.000   |      |                          |                     |
|                             | 26       | 0.54                            | 0.000   |      |                          |                     |
|                             | 27       | 0.66                            | 0.000   |      |                          |                     |
| Happiness                   | 47       | 0.83                            | 0.000   | 0.50 | 0.77                     | 0.74                |
|                             | 48       | 0.78                            | 0.000   |      |                          |                     |
|                             | 52       | 0.49                            | 0.000   |      |                          |                     |
| Sacrifice                   | 53       | 0.72                            | 0.000   |      |                          |                     |
|                             | 54       | 0.71                            | 0.000   | 0.49 | 0.80                     | 0.77                |
|                             | 55       | 0.78                            | 0.000   |      |                          |                     |
|                             | 56       | 0.62                            | 0.000   |      |                          |                     |
| Attraction                  | 58       | 0.63                            | 0.000   |      |                          |                     |
|                             | 59       | 0.76                            | 0.000   | 0.39 | 0.79                     | 0.75                |
|                             | 60       | 0.62                            | 0.000   |      |                          |                     |
|                             | 61       | 0.56                            | 0.000   |      |                          |                     |
|                             | 62       | 0.65                            | 0.000   |      |                          |                     |
|                             | 63       | 0.50                            | 0.000   |      |                          |                     |
| Emotional Exhaustion        | 31       | 0.71                            | 0.000   |      |                          |                     |
|                             | 32       | 0.69                            | 0.000   | 0.47 | 0.79                     | 0.73                |
|                             | 33       | 0.68                            | 0.000   |      |                          |                     |
|                             | 35       | 0.69                            | 0.000   |      |                          |                     |
| Depersonalization           | 36       | 0.74                            | 0.000   |      |                          |                     |
|                             | 37       | 0.75                            | 0.000   | 0.50 | 0.82                     | 0.77                |
|                             | 38       | 0.71                            | 0.000   |      |                          |                     |
|                             | 39       | 0.69                            | 0.000   |      |                          |                     |
| Reduced Personal<br>Success | 40       | 0.50                            | 0.000   |      |                          |                     |
|                             | 41       | -0.45                           | 0.000   | 0.42 | 0.78                     | 0.75                |
|                             | 42       | -0.68                           | 0.000   |      |                          |                     |
|                             | 43       | -0.74                           | 0.000   |      |                          |                     |
|                             | 44       | -0.75                           | 0.000   |      |                          |                     |

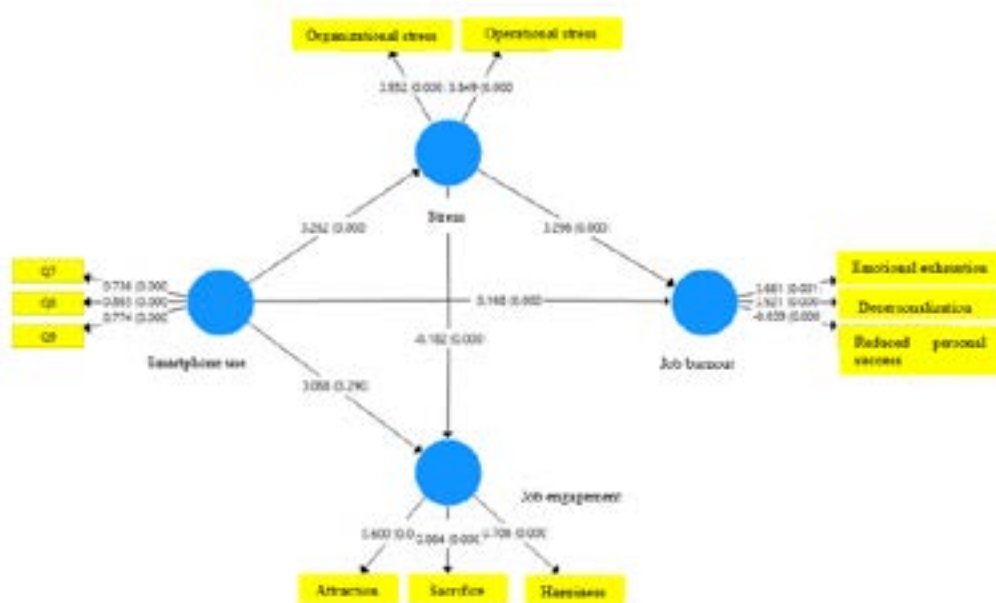


Fig. 2: Structural model of the effects of smartphone uses on job burnout and engagement with job stress as a mediator

reliability. The overall stress scale's reliability was confirmed, with Cronbach's alpha reported at 0.78. The job engagement components—Happiness, Sacrifice, and Attraction—showed composite reliability ranging from 0.77 to 0.80 and Cronbach's alpha from 0.74 to 0.77, confirming the reliability of the job engagement scale. The total job engagement scale had a Cronbach's alpha of 0.81. Regarding the job burnout components—Emotional Exhaustion, Depersonalization, and Reduced Personal Success—composite reliability ranged from 0.78 to 0.82 and Cronbach's alpha from 0.73 to 0.77, confirming reliability. The overall burnout scale had a Cronbach's alpha of 0.80. The AVE values ranged from 0.39 (Attraction) to 0.65 (Smartphone Use). While some AVE values were slightly below the ideal cutoff of 0.50 (e.g., Attraction at 0.39), most components approached or exceeded this threshold, demonstrating acceptable convergent validity across scales. In conclusion, the results confirm that the questionnaire items have acceptable construct validity and reliability, making the scales suitable for further analysis.

#### Testing the main research model

The conceptual model of the research was tested using structural equation modeling with the PLS method.

Fig. 2 illustrates the experimental model, displaying

standardized coefficients and associated probability values. The results show that the p-value was less than 0.05 in four out of five paths, confirming significant relationships between smartphone use and the mediating variable of stress, as well as between smartphone use and job burnout ( $p < 0.05$ ). Additionally, the relationships between stress, job burnout, and job engagement were confirmed ( $p < 0.05$ ). However, the direct relationship between smartphone uses and job engagement was not supported ( $p > 0.05$ ).

#### Investigating model fit

Table 7 presents the fit indices for the research model. The evaluation of the structural model's fit was conducted using two main indices: redundancy (predictive relevance) and coefficient of determination ( $R^2$ ). The Stone-Geisser  $Q^2$  indicator assesses the model's predictive relevance. According to established guidelines,  $Q^2$  values of 0.02, 0.15, and 0.35 indicate weak, medium, and strong predictive relevance, respectively.

The  $R^2$  values indicate that 19.5% of the variance in job burnout and 9.5% of the variance in job engagement are explained by the model. The  $Q^2$  values were 0.12 for job burnout and 0.09 for job engagement, showing moderate predictive relevance for both

Table 7: Fit indices of the research model

| Dependent Variable | R <sup>2</sup> | Q <sup>2</sup> | NFI  | SRMR  |
|--------------------|----------------|----------------|------|-------|
| Job burnout        | 0.195          | 0.12           | 0.83 | 0.078 |
| Job engagement     | 0.095          | 0.09           |      |       |

Table 8: The effects of research variables on each other based on structural equation modeling

| Effects                         | Standard coefficient | standard error | T-value | p-value |
|---------------------------------|----------------------|----------------|---------|---------|
| Smartphone use → Stress         | 0.262                | 0.044          | 7.53    | <0.001  |
| Stress → Job engagement         | -0.182               | 0.044          | 7.53    | <0.001  |
| Stress → Job burnout            | 0.296                | 0.054          | 5.55    | <0.001  |
| Smartphone use → Job burnout    | 0.168                | 0.063          | 2.00    | 0.04    |
| Smartphone use → Job engagement | 0.088                | 0.075          | 0.643   | 0.290   |

endogenous variables. The Normed Fit Index (NFI) was 0.83, indicating an acceptable but slightly lower than average model fit. The Standardized Root Mean Square Residual (SRMR) was 0.078, falling within the acceptable range and suggesting a good model fit. Overall, the model demonstrates an acceptable fit with moderate predictive power.

#### Model relationship testing

Table 8 presents the results of the relationship testing of the research model, reporting the standard path coefficient, standard error, t-value, and significance level (p-value).

Table 8 confirms all effects of the structural equation modeling test ( $p < 0.05$ ). Based on the structural equation modeling test, the effect of smartphone use in the workplace on stress (H1) was confirmed. The direction of the effect was positive, and its intensity was 0.262. Interestingly, the direct path from smartphone use to job engagement was not statistically significant. This finding suggests that engagement may be less directly influenced by mobile connectivity and more strongly affected by mediating variables such as job stress. One possible interpretation is that while smartphones offer potential for engagement through flexibility, their overuse may lead to stress that counteracts these benefits. This supports the theoretical rationale for including stress as a mediating variable in the model. The second hypothesis examination using the structural equation modeling test confirmed the effect of stress on job engagement. The direction of the effect was negative, and its intensity was 0.182. The structural equation modeling test results also

confirmed the effect of stress on job burnout (H3) and smartphone use in the workplace on job burnout (H4). The direction of the effect was positive for both hypotheses, and the intensity of the effect was 0.296 and 0.168 for H3 and H4, respectively.

However, the examination of the fifth hypothesis revealed that the effect of smartphone use in the workplace on job engagement was not confirmed by the structural equation modeling test. Table 9 shows the results of indirect effects, investigating the mediating role of stress in the relationship between smartphone use in the workplace, job engagement, and job burnout. The bootstrapping method was used in SmartPLS software to test the mediators.

The results obtained from Table 9 statistically confirmed the mediating role of stress in the relationship between the use of smartphones in the workplace, job engagement, and job burnout ( $p < 0.05$ ). The intensity of the indirect effects of smartphone uses in the workplace on job engagement and job burnout, with the mediation of stress, was 0.076 and 0.099, respectively. According to the results, the main research hypothesis was confirmed.

#### Discussion

This study addresses the existing research gap regarding the impact of smartphone use in the workplace. Literature highlights that smartphones have become an integral part of daily work life, making it crucial to explore how work-related smartphone use during working hours influences work outcomes (Lin et al., 2017). Previous research has produced mixed findings on the consequences of smartphone use.

Table 9: The moderating role of stress in the relationship between smartphone use in the workplace, job engagement, and job burnout, as determined by the bootstrapping method

| Effect type                              | Indirect effect | Standard error | T-value | p-value |
|------------------------------------------|-----------------|----------------|---------|---------|
| Smartphone use → Stress → Job engagement | -0.76           | 0.024          | 3.14    | 0.002   |
| Smartphone use → Stress → Job burnout    | 0.099           | 0.021          | 4.70    | <0.001  |

For instance, [Van Laethem, Van Vianen, and Derks \(2018\)](#) conceptualize smartphone use at work either as a job demand or a job resource. Job demands typically predict job burnout strongly, whereas job resources are significant predictors of job engagement ([Van Laethem, Van Vianen, and Derks, 2018](#)). Additionally, [Elhai et al. \(2017\)](#) suggest that smartphone use in work settings can increase stress levels. Based on this literature, the present study developed a model incorporating smartphone use as an independent variable, stress as a mediator, and job engagement and burnout as dependent variables. The hypothesized relationships within this conceptual model were empirically tested. The findings reveal that workplace smartphone use positively correlates with increased stress. Scholars have reported both positive and negative consequences of this technology. Some argue that smartphones enhance productivity, facilitate information retrieval, and improve satisfaction through social interaction ([Van Deursen et al., 2015](#)). Conversely, others emphasize the negative ramifications, especially in professional environments ([Panova and Carbonell, 2018](#); [Cha and Seo, 2018](#); [Bae, 2017](#)). According to [Fischer-Grote, Kothgassner, and Felnhöfer \(2019\)](#), excessive smartphone use may provoke uncontrollable behaviors, including mental health issues such as stress and depression, along with physical ailments, disrupting users' daily functioning. [Gonzalez and Santos \(2022\)](#) also highlight the difficulty for employees heavily dependent on smartphones to mentally detach from work, resulting in heightened anxiety and stress. Moreover, [Brubaker and Beverly \(2020\)](#) note a positive relationship between elevated stress and emotional exhaustion alongside increased smartphone addiction. Another key finding is the negative impact of stress on job engagement: as stress rises, job engagement decreases and vice versa. Previous studies similarly show that workplace stress detrimentally affects employee engagement ([Kim and Heo, 2019](#); [Van Laethem et al., 2018](#)), posing a barrier to active participation ([Van Laethem et al., 2018](#)). Furthermore, this

research confirms that stress is positively associated with job burnout, indicating that greater stress leads to higher burnout levels. Existing literature agrees that workplace stress yields multiple consequences for individuals and organizations, with one significant outcome being increased job burnout ([Park, Kim, and Lee, 2020](#); [Brubaker and Beverly, 2020](#)). For example, prolonged exposure to stress significantly diminishes employee productivity, motivation, and effectiveness, ultimately culminating in burnout ([Orhan et al., 2021](#)). [Sasaki et al., \(2021\)](#) identify the workplace as a primary source of stress that can cause depression, burnout, and stress-related illnesses. Similarly, [Carroll et al. \(2022\)](#) emphasize that elevated stress escalates employee burnout, potentially leading to intentions to leave the profession.

Moreover, the study indicates that increased smartphone use at work contributes to greater job burnout, consistent with previous findings that work-related smartphone uses outside working hours exacerbates burnout ([Park, Kim, and Lee, 2020](#)). [Gonzalez and Santos \(2022\)](#) also argue that enforced smartphone use can trigger job burnout. [Brubaker and Beverly \(2020\)](#) further show that excessive smartphone use raises stress, which negatively affects sleep quality and subsequently increases burnout. Contrary to some expectations, however, this study found no significant direct effect of smartphone use on job engagement. Prior research presents mixed outcomes, with some studies indicating negative impacts of smartphone use on job engagement and self-regulation ([Zhao and Yu, 2023](#); [Orhan et al., 2021](#)), while others report positive effects on engagement ([Sasaki et al., 2021](#); [Van Laethem, Van Vianen, and Derks, 2018](#)). Summarizing the findings regarding smartphone use, stress, job engagement, and burnout, it appears that smartphone use may lead to either engagement or burnout, depending on the nature and extent of its use. Nonetheless, the mediating role of stress in influencing these outcomes is critical and cannot be overlooked. This study confirms that stress negatively affects job engagement while positively

influencing burnout. Given that smartphone use can induce stress, managing and channeling this stress constructively within organizations toward positive technology use can enhance job engagement, productivity, and organizational growth. Conversely, neglecting stress management regarding smartphone use may result in adverse consequences such as increased burnout, diminished productivity, and lower organizational performance. This study contributes to the existing literature by integrating four key constructs—smartphone use, job stress, burnout, and engagement—within a unified conceptual framework. By employing the Job Demands–Resources (JD–R) model in a Middle Eastern organizational context, the research highlights job stress as a central psychological pathway through which mobile technology influences employee outcomes. This approach offers a refined understanding of how digital tools reshape occupational experiences beyond Western settings, emphasizing stress not only as an outcome but as a key mediator and modifiable organizational factor. Like any other research, the present study has some limitations that could not be addressed because the examination of these limitations was out of the scope of the research. However, mentioning and paying attention to the major limitations can be a valuable guide for future researchers. Because the researcher was a member of the study organization and direct communication with the statistical population was almost impossible, the online questionnaire tool was used to facilitate appropriate access for the research statistical population to the questionnaire. Therefore, future researchers can communicate directly with the sample to better understand the research population and select the appropriate statistical sample. Considering the specific nature of the questionnaire, collecting complete and perfect data was impossible. Therefore, future researchers can use other tools, such as interviews etc., to conduct similar research and compare results. Considering the limited time available to the researcher, it was impossible to examine the statistical population in the long term and re-examine it at another time. Therefore, future researchers should conduct similar research in different periods and compare the obtained results. Out of 1 main and 5 secondary hypotheses raised in the current research, one secondary hypothesis was not confirmed, and the results obtained were not consistent with previous literature. However, a qualitative

investigation of the reason for the rejection of this hypothesis was not included in the framework of this study. Therefore, future researchers are advised to conduct similar research using a qualitative method. Because this research used a single statistical sample, the results obtained were attributed to the characteristics of this particular sample, making it difficult to generalize the obtained results to a wider society.

Thus, future researchers should conduct similar research on different statistical populations to generalize the results. Overall, based on the results of this research, it is suggested to control employees' stress, increase job engagement, and finally reduce burnout among employees to reduce the negative effects of using smartphones in the workplace and increase their positive effects. In line with stress management, managers can provide a place for employees to take a short break and consider the necessary measures to provide a one-day leave under the title of monthly leave for women. On the other hand, considering the responsibilities and concerns of women for house-keeping and childrearing, some hours should be devoted as floating hours for women and mothers, or they should be allowed to work remotely on some days of the week. In addition, signing a contract with a kindergarten near mothers' workplaces can greatly reduce their mental pressure and subsequent stress. In addition, considering more flexible work schedules for different job positions can reduce the pressure on employees with higher job ranks and give them more time to address their duties. An organization can reduce stress and job burnout by providing its employees with job security. For example, considering the duration of the contract, married employees with higher performance can experience significantly lower levels of burnout and psychological security. Besides, setting up a treatment clinic and providing family counseling to married couples in a completely confidential space, considering diverse and family entertainment programs, including travel, or devising different events under the title of a couple's tour, can help employees to have more interaction with other colleagues, regardless of work-related topics. In addition, providing facilities to single people, including marriage loans from the company, necessary allowances, such as service compensation packages, especially in the first year of life, and encouraging them to get married can increase their job engagement. Stress management programs can be used to control

and improve employees' workplace conditions when using smartphones. The installation and launch of internal organizational programs can also significantly improve comfortable smartphone use in the workplace. The use of internal organizational programs provides more security for the transfer of information in the work environment, which can significantly affect the level of stress when using smartphones in the workplace. Managers and organizational officials should not only reduce employees' negative stress in organizational environments but also look for ways to increase positive excitement in the organization to reduce employee burnout and increase job engagement, which will subsequently boost individual and organizational productivity. For example, employees refer to factors such as fear of being fired, delayed work due to others' underemployment, pressure to meet expectations without increasing job satisfaction, an attempt to achieve the highest productivity, and a lack of control over how to do the work. Thus, to control employee stress, organizations can give employees a sense of confidence and psychological security to reduce their job stress (e.g., extending the duration of contracts for high-performing personnel), create coordinated teams with strong communication and interactions in the organization to do collective work, identify the capacities of employees and assign appropriate tasks to them, and give employees a sense of independence and autonomy to make decisions freely while working. Through training and addressing the psychological burden caused by working hours, an organization instills convenience and security in smartphone use in the workplace, controlling the effect of this technology on increased job burnout and enabling positive use of this technology. Some educational solutions include time management (using time management applications on the computer that can establish a personal-professional balance and also reduce the tension and mental conflict of employees as one of the job demand factors), establishing usage restriction policies (promoting times without mobile phones in the organization can reduce smartphone dependence and increase interpersonal interactions among employees, subsequently reducing burnout), and considering a place smartphones before meetings and doing teamwork to control volume and work pressure, which can increase the employees' concentration while also enhancing productivity, reducing job errors, and lowering the levels of job burnout.

## CONCLUSION

In summary, smartphone use at work can lead to either positive outcomes, such as increased engagement, or negative consequences like burnout, depending largely on how and to what extent the devices are used. Stress plays a crucial mediating role by reducing job engagement while simultaneously increasing burnout. Therefore, organizations must acknowledge the dual nature of smartphone use and prioritize effective stress management to maximize its benefits and minimize potential harms. Failure to address stress related to smartphone use risks higher burnout rates, diminished productivity, and impaired overall performance. To optimize smartphone, use in the workplace and promote employee well-being, several practical measures can be adopted. Providing dedicated rest areas and allowing short breaks during work hours can help alleviate mental fatigue. Offering flexible working hours and remote work options, particularly for employees with caregiving responsibilities such as mothers, can ease the stress of balancing work and family duties. Establishing partnerships with nearby childcare facilities can further reduce parental stress. Enhancing job security by offering longer-term contracts to high-performing and married employees contributes to psychological safety and lowers burnout. Confidential counseling and family support programs can assist employees in managing personal and work-related stress, while social and recreational activities encourage collegiality and help reduce workplace tension. Organizations should also implement policies and training to promote secure and efficient smartphone use. This includes setting clear guidelines for data security to reduce anxiety over information transfer and providing training on time management techniques and apps that help balance professional and personal smartphone use, thereby preventing overuse and associated stress. Instituting phone-free periods during meetings or collaborative work can improve focus and reduce distractions. Additionally, fostering a positive work environment by assigning tasks that align with employees' skills and granting autonomy in decision-making enhances job satisfaction. Building coordinated teams with strong communication channels supports workload sharing and creates a more supportive atmosphere. Extending contract durations or offering incentives for high performers further strengthens psychological safety and confidence. By proactively managing stress and shaping the

use of smartphones constructively, organizations can enhance job engagement, reduce burnout, and ultimately improve both individual employee satisfaction and overall organizational performance. Building on the limitations and findings of this study, several avenues for future research are suggested. First, as this study was conducted within a single telecom organization in Iran, future research should replicate the model across diverse industries and cultural contexts to enhance generalizability. Second, the cross-sectional design limits causal inference; therefore, longitudinal or experimental studies are recommended to better capture the dynamic effects of smartphone use on stress, burnout, and engagement over time. Third, since data collection relied exclusively on self-reported questionnaires, incorporating qualitative methods such as interviews or mixed-method designs could provide richer insights into employees' lived experiences of mobile connectivity and job stress. Finally, the results indicated that smartphone use directly increased burnout but had no significant direct effect on engagement. Future studies could explore potential moderators (e.g., organizational support, digital literacy, personality traits) that may shape when and how smartphone use contributes to engagement versus burnout.

#### AUTHOR CONTRIBUTIONS

H.R. Nematollahi conceptualized the study, developed the research methodology, conducted the data collection and analysis, and wrote the majority of the manuscript. N. Mohammad Esmaili provided academic supervision, contributed to the study design, reviewed the manuscript, and offered critical revisions. S. Naghdi Zarrin assisted with data collection, contributed to the literature review, and helped in drafting specific sections of the manuscript.

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#### CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy, have been completely witnessed by the authors.

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#### ABBREVIATIONS (NOMENCLATURE)

|      |                                              |
|------|----------------------------------------------|
| JD-R | Job Demands–Resources                        |
| SEM  | Structural Equation Modeling                 |
| AVE  | Average Variance Extracted                   |
| CR   | Composite Reliability                        |
| MCI  | Mobile Communication of Iran (Hamrah-e Aval) |
| PLS  | Partial Least Squares                        |
| ICT  | Information and Communication Technology     |

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