

A Review of Research on Female Knowledge Workers' Stress in Digital Contexts

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Abstract

The digital age has brought a degree of convenience to both organizations and individuals, as well as some negative effects. How to seek to benefit from the use of digital technology and to avoid its adverse effects as much as possible is an important topic to be discussed. We used literature analysis to conduct a detailed analysis of the work characteristics of female knowledge workers in the digital context in detail from the aspects of work-family conflict, the complexity of digital technology, data security, entrepreneurial willingness, and career growth. It enriches the knowledge of enterprises about the work characteristics of female knowledge workers in the digital context, and improves the scientific decision-making ability of management for enterprises, which can provide certain references for enterprises to improve the satisfaction and happiness of female knowledge workers. The management implication is that providing more resources and support to female knowledge workers and letting them feel more attention and respect from the organization can improve their morale and work motivation, thus contributing to the development and growth of the enterprise.

Keywords

Digitalization, Female Knowledge Workers, Work-Family Conflict, Career Growth

1. Introduction

Nowadays, the global economy is generally characterized by digitization, which signifies that human society is moving towards a new stage centered on digital productivity (Li & Miao, 2020). With the advent of the digital era and the rapid development of digital information technologies such as the Internet and mobile communication networks, the lives and work of employees have undergone

fundamental changes. Digital technology brings convenience to people's lives, but also brings some work stress, role ambiguity and security issues. Employees may feel anxious in digital applications, which may lead to psychological problems. Psychologists tend to believe that stress is an emotional experience accompanied by discomfort and tension, which is caused by environmental demands that an individual perceives to be beyond his or her capabilities (Chen, 2016). Cavanaugh et al. (2000) proposed the concept of stress dichotomy and classified it into two categories based on the intrinsic attributes of the stressors: challenging stressors and hindrance stressors. Hindrance stressors refer to stressors that employees encounter at work that limit their achievements and prevent them from realizing their goals, which can be caused by bureaucracy, role ambiguity, etc. Challenging stressors refer to stressors that enhance personal abilities and accelerate the achievement of accomplishments, which can be caused by stressors such as work scope, responsibility, etc.

As the education level of Chinese women increases, more and more women have tertiary education and above. These groups of women with a certain level of education are equipped with professional knowledge and skills that enable them to utilize their intelligence to create value for the organization and to achieve their personal aspirations and pursue their goals of self-worth, which is called female knowledge workers (Chen et al., 2020). Studies have shown that women seek treatment for mental health problems in outpatient clinics and receive counseling services provided by mental health providers more often than men (Attridge, 2019). According to the Person-environment Fit Theory, when there is a high degree of congruence or adaptation between female knowledge workers and their environment, positive outcomes are produced, while negative congruence or dissonance produces negative stress (Li & Zhang, 2019). Female knowledge workers are not only subject to direct factors, such as individual abilities and skills, but also significantly influenced by the environment in the process of output. In fact, the interaction between female knowledge workers and the environment affects their output to a great extent. In other words, when the traits of female knowledge workers match with the environment they are in, it will stimulate positive attitudes and behaviors in individuals, which will promote output; on the contrary, when the traits of female knowledge workers do not match with the environment they are in, it may lead to undesirable consequences, such as stress. According to the Social Support Theory (Zhang et al., 2023), when female knowledge workers feel care, love, respect, understanding and help from the group, they may have a stronger sense of happiness and warmth, which will enhance the satisfaction level of their psychological needs and further affect their behavioral decisions. Therefore, thoroughly understanding the characteristics and needs of female knowledge workers in the digital context will help to make full use of the convenience brought by digitization to female knowledge workers, reduce the negative impacts of digitization, and give more social support to female knowledge workers, which is of great significance to the promotion of enterprise development.

Based on the existing literature, this paper compiles and analyzes the work characteristics of female knowledge workers in the digital context to provide theoretical guidance and practical inspiration for enterprises to care for and scientifically manage female knowledge workers.

2. Theoretical Basis and Research Hypothesis

2.1. Work-Family Conflict

Qi & Liu (2020) pointed out that the connectivity of the Internet has given rise to online work styles such as e-commerce and platform employment, which can satisfy women's demand for fragmented time and work flexibility, allowing female knowledge workers to arrange their working hours and locations more freely, and to realize telecommuting and flexible work, which alleviates the conflict between female knowledge workers' work and family life to a certain extent. However, Harris et al. (2022) found that technological pressures may also blur the boundaries between work and family, leading to more work-family conflicts as employees find it difficult to balance their work and family roles.

In fact, the use of digital work technology makes it possible for leaders to reach their employees at any time, even during non-working hours, leaders can inform their employees to handle work affairs remotely through communication technology. Based on the analysis above, we propose the following hypothesis:

H1: There are positive and negative effects of digital technology on family-work conflict among female knowledge workers.

2.2. Digital Technologies Complexity

Chan et al. (2021) point out that workplace digitization reduces the burden of routine repetitive tasks on employees, which in turn allows them to better engage in tasks that require innovative thinking, analytical and decision-making skills. Li (2022) states that the underlying construction of digital technology requires a large number of science and technology talents (STEM) such as computer, robotics and intelligent manufacturing engineers. However, female polytechnic skills are generally deficient due to both innate and acquired factors. As the complexity of digital work tasks increases, female knowledge workers need to constantly acquire new technologies and tools to adapt to the changing work environment. For female knowledge workers who are not familiar with digital technology, learning new technological knowledge requires them to invest more time and effort, which can be a challenge. Based on the analysis above, we propose the following hypothesis:

H2: The use of digital technology challenges female knowledge workers with a certain level of complexity.

2.3. Data Security

Ameen et al. (2020) point out that cybersecurity issues related to the use of digital technologies have proved to be a major problem for international companies

when dealing with official business. Cloud Security Alliance (CSA) suggests that cloud computing technology may have security threats such as data leakage, data loss, and account theft, etc. (Deng & Yi, 2020). Employees' personal data, including search history, shopping records, and social media activities, are easily collected and used by merchants and advertisers, which may expose female knowledge workers to data security threats such as hacking, virus infection, and phishing. Based on the analysis above, we propose the following hypothesis:

H3: The use of digital technology may trap female knowledge workers in data security threats.

2.4. Entrepreneurial Willingness

Through the Internet and e-commerce platforms, female knowledge workers can easily enter the field of entrepreneurship and operate their own business. Digital links can break the boundaries of time and space, which to a certain extent alleviates women's work-family conflicts and releases women's entrepreneurial willingness (Rey-Martí et al., 2015). In the context of big data, the value delivery link in the business model has changed, which is no longer the one-way output of the product supply side in the past, but enriches the consumers' demand for product diversification, thus creating more business opportunities suitable for female entrepreneurs (Qiang & Teng, 2022). Based on the analysis above, we propose the following hypothesis:

H4: The digital economy enhances the entrepreneurial willingness of female knowledge workers.

2.5. Career Growth

The digital economy provides a wide range of online learning resources and training opportunities that enable female employees to acquire knowledge and skills regardless of time and location. When female knowledge workers are immersed in realistic learning environments created by VR/AR, digital twins, holographic technologies, etc., they will fully utilize their physical experience and cognition (Li & Liu, 2022). Through online learning platforms and virtual training, female knowledge workers can enhance their professional competence and knowledge, thus gaining better career development opportunities. Based on the analysis above, we propose the following hypothesis:

H5: Digital technology can lead to better career development opportunities for female knowledge workers.

Through a review of the relevant literature, we found that the use of enterprise digitization has a double-edged effect on female knowledge workers. Digital technological complexity challenges female knowledge workers, which may expose them to data security and blur the boundaries between work and family. However, to a certain extent, it also alleviates work-family conflict, while enhancing the entrepreneurial willingness of female knowledge workers, which is conducive to their career growth. In the management process, enterprises are

not just to enjoy the dividends brought by digital technology but should pay more attention to some unfavorable factors brought by digital technology and take effective measures to improve them, and give full play to the advantages of digital technology so as to continuously improve the competitiveness of enterprises.

3. Measurement of Reference Content

We analyze the work characteristics of female knowledge workers in the digital context in the existing literature, sort out work-family conflict, digital technology complexity, data security, entrepreneurial willingness, and career growth related scales and propose the measurement reference content, to provide a basis for enterprises to measure the work characteristics of female knowledge workers in the digital context.

Type	Author	Subject	Element
Work-family conflict	Wayne et al. (2004)	4	<ol style="list-style-type: none"> 1) Your job reduces the amount of time you have to be active at home. 2) Work stress can make you irritable at home. 3) Your job makes you feel too tired to do the things that require attention at home. 4) When you are at home, work worries or problems distract you.
Digital technology complexity	Fischer et al. (2021)	5	<ol style="list-style-type: none"> 1) You often find it too complicated to complete a task using the information communication technology (ICT) available at work. 2) You often need more time than expected to complete a task using Information Communication Technology (ICT) available at work. 3) You feel that the Information Communication Technology (ICT) available to you at work is too confusing. 4) You often can't find enough time to keep up with the new features of Information Communication Technology (ICT) at work. 5) It takes you a long time to fully figure out how to use the Information Communication Technology (ICT) available to you at work.
Data security	Fischer et al. (2021)	5	<ol style="list-style-type: none"> 1) You are concerned that your use of Information Communication Technology (ICT) is not as confidential as you would like. 2) You are concerned that the information you exchange using Information Communication Technology (ICT) is not as protected as you would like. 3) You are concerned that malicious outsiders (e.g. hackers) can easily copy your identity because of ICT. 4) Your personal information is too easily accessible due to Information Communication Technology (ICT). 5) You are concerned that your personal information can be easily stolen by others online.
Entrepreneurial willingness	Huang & Liu et al. (2022)	5	<ol style="list-style-type: none"> 1) I think I would be more inclined to start a business in a digital context. 2) I have considered running my own company. 3) I would choose to start my own business if I had the opportunity and I had the freedom to make decisions. 4) I would still choose to start my own business, considering my real situation and limitations (e.g., taking care of my family, etc.). 5) I think it is very likely that I will start my own business in the next 5 years.

Continued

Career growth	Xiang et al. (2017)	11	<ol style="list-style-type: none"> 1) Your current job brings you closer to your career goals. 2) Your current job is closely related to your career goals and aspirations. 3) Your current job provides a foundation for realizing your career goals. 4) Your current job provides you with better opportunities for advancement. 5) Your current job motivates you to learn new job-related knowledge and skills. 6) Your current job has enabled you to gain richer work experience. 7) Your current job allows you to constantly practice and improve your professional abilities. 8) In your current workplace, you have great possibilities for job promotion. 9) Compared with your coworkers, your career development is faster. 10) Your salary will be increased more quickly in your current workplace. 11) In your current organization, you have a high probability of getting a salary increase.
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4. Conclusion

The use of digital tools and platforms can greatly alleviate work-family conflicts for female knowledge workers. However, due to the blurring of time boundaries, it can also lead to female knowledge workers working during non-working hours, which in turn may exacerbate home-work conflicts to some extent. For female knowledge workers, the gradual increase in the complexity of digital technology means that they need to be constantly learning to keep up with the pace of technological change. The issue of data security is also noteworthy in the big data environment. Female knowledge workers will increase their willingness to be creative due to the emergence of online employment platforms. The increase in online learning resources and training has given female knowledge workers more opportunities for career growth. The following management insights are the main takeaways from this study:

1) Companies should provide social support for female knowledge workers. Enterprises can support female knowledge workers to take paid vacations, work flexibly, provide childcare services, and set up telecommuting positions to alleviate the work-family conflicts of female knowledge workers to a greater extent, so as to effectively improve their work performance. Companies can also give more humanistic care to female knowledge workers, which is not only a kind of respect for them, but also helps to improve their productivity and creativity.

2) Companies should work in strict accordance with the prescribed hours to reduce the behavior of work connectivity during non-working hours. The company should have a clear policy specifying that no notification of work matters should be made during non-working hours and publicize this to employees to ensure that everyone understands and complies with this policy. To avoid distributing work tasks during non-working hours, companies can establish specialized communication channels, such as internal mail systems or work groups, which are open and replyable only during working hours. Companies can encourage employees to develop good work habits, such as rationalizing work schedules, improving work efficiency, and reducing the need for overtime, the-

reby reducing the need to communicate about work matters during non-working hours.

3) Enterprises should provide vocational training for female knowledge workers. Enterprises should take advantage of the changes in the wave of digital technology to provide female knowledge workers with skills training in artificial intelligence, big data, and blockchain, so as to overcome the difficulties caused by digital complexity. Companies can provide internal and external training opportunities for female knowledge workers to improve the vocational skills and quality of female knowledge workers, and thus improve the competitiveness of the company.

4) Companies should ensure data security. Companies should assign different data access rights according to the duties and needs of employees to ensure that data can only be accessed by authorized personnel. It should also formulate a data security policy that specifies the objectives, principles, standards and processes of data security to ensure that all employees can understand and comply with it.

5) Companies can establish entrepreneurial communities or network platforms for female knowledge workers, providing them with a channel for sharing experiences, exchanging resources, and offering support and cooperation opportunities. In addition, enterprises can provide partial financial support, for example, by setting up special financial support programs to provide potential female entrepreneurs with start-up capital, business loans or venture capital. Educational opportunities for entrepreneurship training, skills training and business knowledge can also be provided to female knowledge workers to help them acquire the skills and knowledge necessary for entrepreneurship.

6) Companies should provide career growth opportunities for female knowledge workers. The enterprise can optimize its management and improve its internal promotion system from the four dimensions of career growth: career ability, career goals, promotion within the organization, and rate of compensation growth. Companies can also provide internal promotion opportunities in conjunction with job performance considerations, so that female knowledge workers have the opportunity to develop their careers within the company, thereby reducing their career anxiety.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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