PSYCHOLOGICAL WELL-BEING IN INDUSTRY 4.0: A CONCEPTUAL STUDY OF GENDER DIFFERENCES

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Abstract. The rapid digitalisation and technological advancements associated with Industry 4.0 are transforming work environments, job demands, and employee expectations across sectors. While these changes create new opportunities for flexibility, innovation, and productivity, they also introduce increased pressures that can affect workers' psychological well-being in different ways. Emerging literature highlights mental health and well-being as critical concerns in the digital era, yet limited attention has been given to how these changes are experienced differently by men and women. This conceptual paper aims to examine gender differences in psychological well-being within the context of Industry 4.0, with a focus on work demands, work–life balance, and organisational support. Through a critical review of existing empirical and theoretical studies, a conceptual framework is proposed, drawing on the Job Demands–Resources (JD–R) theory and supported by Ryff's Psychological Well-Being model. This framework provides an understanding of how demands and resources associated with Industry 4.0 shape the well-being of men and women in both similar and different ways. The study offers insights for policymakers, organisations, and researchers in developing more inclusive and gender-sensitive strategies to support employee well-being in technology-driven workplaces and contributes to discussions on sustainable work and mental health in the Fourth Industrial Revolution.
Keywords: *psychological well-being, gender difference, IR 4.0, work and employment*

Introduction

Psychological well-being has become an important focus in contemporary discussions of health, work and quality of life. It is not simply the absence of mental illness. It reflects how well a person is functioning and thriving in daily life, including self-acceptance, having a clear sense of purpose, autonomy, positive relationships, the ability to manage life's demands, and ongoing personal growth, as described in Ryff's multidimensional model (Babnik et al., 2022). Understanding how psychological well-being is experienced and maintained across different groups matters because it helps policymakers and practitioners design more targeted support, creating healthier lives that people can sustain over the long term. In Industry Revolution 4.0 (IR4.0), psychological well-being is getting more attention because digitalisation is reshaping work in a very personal way, not only what people do, but what it's like to experience work each day. Many employees are now expected to stay connected almost all the time, keep up with faster timelines, adjust to remote or hybrid routines, and work within digital systems. Although these changes can boost productivity and make processes smoother, they can also increase pressure and make it harder for employees to fully disconnect, rest, and recover mentally. When workplace support is insufficient, such as

unclear guidance, limited training, lack of autonomy, or weak leadership support, employees are more likely to experience stress and emotional exhaustion. Recent studies connect these digital-era pressures to technostress, where employees may feel overwhelmed by technology, frequently interrupted, or anxious about whether they can keep up with constant system changes (Kumar, 2024). Researchers often describe this through the Job Demands–Resources (JD-R) theory, which explains that heavy demands in digital work can reduce energy and well-being, while access to strong resources, such as supportive management, autonomy, and opportunities for skill development, can help employees cope and maintain psychological well-being.

Digitalisation therefore brings both benefits and challenges. On one hand, technology can improve flexibility, support learning, and reduce physically demanding tasks. On the other hand, it can accelerate work pace, increase expectations for constant availability, and create uncertainty due to continuous changes in systems and job requirements. Research on technostress shows that when technology increases workload, complexity, and insecurity, employees are more likely to experience strain and report lower levels of well-being (Kumar, 2024). Despite these developments, gender differences in psychological well-being within IR4.0 remain underexplored. Many studies include gender as a control variable but do not fully explain why men and women may experience digital work differently. This paper views gender differences as shaped by the organisation of work, levels of exposure to job demands, and access to resources and opportunities. This issue is particularly important in Asia, where digital transformation is progressing rapidly, while labour protections, gender norms, and access to reskilling opportunities vary across countries and sectors.

Literature review

Previous studies related to psychological well-being on gender

Before looking at gender differences, it is important to understand what psychological well-being means. Most of the research in this area is based on the model developed by Ryff (1989), who argued that well-being is more than just feeling happy or being satisfied with life. Instead, Ryff described psychological well-being as a state of positive functioning made up of six dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff, 1989). Autonomy refers to a person's ability to think and act independently. Environmental mastery is the ability to manage daily demands and shape one's surroundings. Personal growth reflects a sense of continued development, while positive relations describe warm and trusting connections with others. Purpose in life refers to having goals and a clear sense of direction, and self-acceptance means holding a positive attitude toward oneself. This multidimensional view is useful for the present study because gender differences do not appear equally across all six dimensions. As shown in earlier research, men and women may differ in areas such as autonomy, personal growth, or purpose in life, even when their overall well-being scores look similar (Matud et al., 2022; Matud et al., 2020). Using Ryff's model therefore allows well-being to be examined in a more detailed way, rather than treating it as a single overall score. It also provides a clear framework for studying how a changing work environment, such as Industry 4.0, may affect each dimension differently for men and women.

Recent studies suggest that gender does play a role in psychological well-being, but its influence is not always clear or the same for everyone. Differences between genders are not always reflected in overall well-being scores. Instead, they tend to appear in particular aspects such as autonomy, personal growth, relationships with others, life satisfaction, depressive symptoms, and emotional distress (Matud et al., 2022). This means that gender should not be seen as the only reason for these differences, because other factors like social roles, age, environment, and gender expectations also play a part. Matud et al. (2022) found that women in emerging adulthood scored higher than men in purpose in life and personal growth. However, the main factors linked to psychological well-being for both groups were high self-confidence, less negative self-view, and strong social support. This shows that while gender differences are present, they are not caused by gender alone. Personal and social factors also help explain these differences. Research on older adults showed a different result. In a study of 1,201 adults in Spain aged 65 to 94, Matud et al. (2020) found that men scored higher than women in self-acceptance, autonomy, purpose in life, and environmental mastery. At the same time, self-esteem and social support were the strongest factors linked to psychological well-being for both men and women. This suggests that gender differences in well-being may change across different stages of life, and age should be considered an important factor in studying well-being. Among adolescents, the findings are more similar across studies. Yoon et al. (2023) followed 8,612 young people in England between the ages of 11 and 14 and found that girls reported more mental health problems and lower well-being than boys over time. These differences remained even after other factors, such as social background and resilience, were considered. This indicates that early adolescence is an important stage when gender differences in well-being become easier to see. A similar pattern appears in studies on positive youth development. Tomé et al. (2021) found that girls scored higher in caring, character, and connection, while boys showed better results in some areas of general well-being and had fewer psychological symptoms. This shows that gender differences in well-being are not the same in every area. Each group may have its own strengths and challenges during development.

Besides, studies on young people's independence and relationships also show gender differences in certain areas. García-Castilla et al. (2020) found that female participants scored higher in positive relationships with others, personal growth, and understanding their context. The study also showed that young people who were in a romantic relationship had better environmental mastery and a stronger sense of purpose in life. This means that both gender and relationship experiences can affect the development of psychological well-being among youth. Recent studies also looked at the wider social environment, not only personal factors. Chen et al. (2023) found that adults living in areas with higher gender inequality reported lower subjective well-being after seven years, and this was true for both men and women. The study also showed that traditional gender-role beliefs partly explained this relationship. In the same way, Blanchflower and Bryson (2024) found that women scored higher than men on negative emotions and lower than men on most positive emotions, even though overall happiness and life satisfaction sometimes appeared similar. These findings show that gender differences in well-being may depend on the type of measure used and are influenced not only by personal experiences but also by social conditions and gender expectations.

Overall, the relationship between gender and psychological well-being is complex and influenced by multiple factors. Gender differences exist, but they vary across life

stages, dimensions of well-being, and social contexts. Factors such as social support, self-esteem, and confidence play a significant role in shaping psychological well-being. Therefore, examining gender in relation to psychological well-being provides valuable insights for developing targeted interventions and support systems. What these studies share, however, is a focus on personal and social factors rather than on the work environment itself, which an environment that has changed considerably under Industry 4.0. Industry 4.0 has reshaped work through automation, artificial intelligence, robotics, the Internet of Things, big data, and computing. The gains in speed and output are real, but so are the new demands placed on the people doing the work. Employees are now expected to keep learning, move between systems, and stay reachable in ways that earlier generations of workers were not. One frequent result is technostress, the strain people feel when the pace or complexity of digital tools outruns their ability to cope. It often shows up as anxiety, fatigue, lower job satisfaction, and a general dip in well-being. Researchers also point to heavier mental load, the fading line between work and home, and the sense of never quite being able to switch off. Job insecurity adds another weight. As machines take over routine work, the worry of being replaced becomes its own source of stress. Some scholars now describe the response to these pressures as a shift toward Industry 5.0, which tries to put human well-being back at the centre of how technology is introduced. The common thread is that Industry 4.0 is not neutral for well-being: the same tools that raise productivity can wear people down when the support, skills, and resources to adjust are missing.

Technology reaches every desk, but a growing body of work suggests it does not land on everyone in the same way. Several studies report that women, on average, describe higher technostress than men, and the reasons seem to have less to do with actual ability than with confidence and context. Makowska-Tłomak et al. (2026), for example, found a clear gender gap in digital transformation stress among employees going through a major IT change, even though men and women in their sample had comparable digital skills. They traced much of the gap to self-efficacy because technology is still stereotyped as a male domain, some women approach digital tasks with less confidence, and the fear of confirming that stereotype, which psychologists call stereotype threat, becomes an added source of strain. It should be noted that their psychometric sample was small, so the finding is best treated as indicative rather than conclusive. Job roles matter as well. Men are more likely to hold technology-intensive positions where training is built into the role, while women more often work in administrative or service positions with narrower access to advanced tools and upskilling, which can leave them feeling a step behind each new rollout. Automation sharpens the concern. Drawing on individual-level task data from thirty countries, Brussevich et al. (2018) estimated that a larger share of the female workforce faces a high risk of displacement by technology than the male workforce, because women are concentrated in the routine, codifiable tasks that machines absorb first. The same report is careful to note the other side, however: the flexible and remote arrangements that digital work makes possible can widen women's options if gaps in skills and access are closed. Industry 4.0, in short, can either widen or narrow existing gender gaps, depending largely on how it is introduced and managed.

Pulling these threads together, well-being emerges as something shaped by gender, life stage, social support, self-esteem, and the surrounding social climate, and, once work enters the picture, by technological change as well. The Industry 4.0 environment carries both promise and risk for well-being, and that risk is not shared equally. Women

may carry more technostress, lower technological confidence, and greater exposure to automation, while men face their own pressures around overload and constant availability. What stands out is how rarely these strands are studied together. Most existing research examines either gender and well-being or technology and well-being, and very little examines psychological well-being through a gender lens specifically within the Industry 4.0 context, let alone in a structured, conceptual way. This paper sets out to address that gap by using Ryff's six dimensions as a framework for thinking through how the demands of Industry 4.0 may weigh differently on men and women. Doing so offers a starting point for later empirical work and for designing workplace support that is sensitive to gender.

Ha1: There is a significant difference in psychological well-being based on gender in the context of Industry 4.0.

Proposed research framework

This study proposes the following conceptual framework to show gender differences in psychological well-being (*Figure 1*).

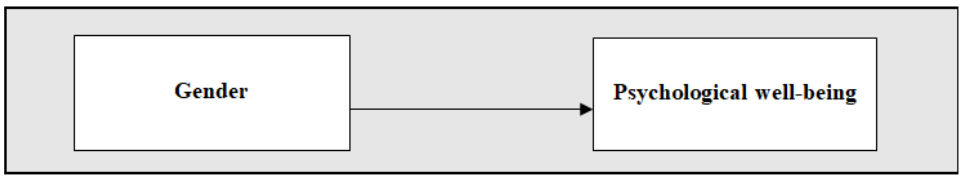

Figure 1. *Conceptual framework on gender difference in psychological well-being.*

Underpinning theory

Job Demands-Resource Theory (JD-R)

This concept paper is underpinned by the Job Demands-Resources (JD-R) Theory and supported by Ryff's Model of Psychological Well-Being. The JD-R theory proposes that employees' well-being depends largely on the balance between the demands of their work and the resources they have to meet those demands (Bakker and Demerouti, 2007; Demerouti et al., 2001). This idea is especially relevant in the context of Industry 4.0, where employees must continually adjust to rapid technological change, automation, digitalisation, and new work systems. Such changes can bring pressure, uncertainty, and emotional strain, all of which may lower psychological well-being. The theory divides the working environment into two broad groups. Job demands are the parts of work that require sustained effort and carry a psychological cost, such as heavy workloads, time pressure, technostress, and job insecurity. Job resources are the aspects of the job that help employees cope with these demands, reach their goals, and keep developing, such as social support, learning opportunities, autonomy, and access to technology. Ryff's model is used to define what psychological well-being actually consists of. It describes well-being through six dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff and Keyes, 1995; Ryff, 1989). The JD-R theory helps explain why these differences in demands and resources may translate into differences in well-being, and Ryff's model helps show which dimensions of well-being are most affected. Together, they clarify how gender may be associated with psychological well-being in

the context of Industry 4.0. Men and women may experience job demands and available resources differently due to social roles, workplace expectations, and access to support. Therefore, these theories help explain how gender may be associated with psychological well-being in the context of Industry 4.0.

Materials and Methods

This study adopts a conceptual approach to examine gender differences in psychological well-being within the context of Industry 4.0. Unlike empirical research, it does not gather primary data through surveys, interviews, or experiments. Instead, it builds its argument by drawing together and interpreting existing knowledge, an approach well suited to a topic that has been studied in parts but rarely brought together as a whole. The aim is not to measure the relationship between gender, well-being, and technological change, but to clarify how these ideas connect and to propose a framework that later empirical work can test. Because the study is built on existing knowledge, all of its materials come from secondary sources. These are works that other researchers and organisations have already written and published. The paper draws mainly on peer-reviewed journal articles, which are studies that have been checked by other experts before being published, along with academic books, book chapters, and reports produced by governments and international organisations. Sources of this kind were chosen on purpose, because they have already passed through some form of expert or institutional review, which makes them more dependable than opinion pieces, blogs, or other unchecked material. In simple terms, the paper tries to rest its discussion on evidence that can be trusted. The relevant literature was gathered by searching for studies connected to the paper's three main themes which are psychological well-being, gender differences, and the changes brought by Industry 4.0. The findings from the literature were organised through the JD-R theory to build a conceptual framework. This framework sets out, in a structured way, how gender and psychological well-being may be linked within the Industry 4.0 workplace, and how the balance of demands and resources might help explain that link. The framework is the main outcome of the paper. It is not meant to be a final answer, but a starting point to get a clear picture of how the pieces may fit, which other researchers can examine and test in future work. The paper uses this framework to consider what the issue may mean in practice. It reflects on the kinds of studies that would be needed to test the ideas presented here, and on the steps that employers and policy makers might take to support the well-being of employees, both men and women, as workplaces continue to change.

Results and Discussion

The conceptual analysis suggests that gender differences in psychological well-being are multidimensional and cannot be adequately understood through overall well-being scores alone. Drawing on Ryff’s psychological well-being model, the review identifies autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance as six important dimensions through which gender-related experiences can be examined. These dimensions provide a broader understanding of psychological well-being because individuals may demonstrate strengths in certain aspects while experiencing difficulties in others. Previous studies indicate that gender differences vary across age groups, social environments, and

individual circumstances rather than following a consistent pattern. For example, Matud et al. (2022) reported that women in emerging adulthood demonstrated higher levels of purpose in life and personal growth, whereas Matud et al. (2020) identified higher levels of autonomy, environmental mastery, self-acceptance, and purpose in life among older men. Similarly, Yoon et al. (2023) highlighted differences in adolescent mental health and subjective well-being trajectories, suggesting that gender-related psychological experiences may develop differently over time. These findings are consistent with the conceptual understanding that psychological well-being reflects individual development, social relationships, and environmental conditions rather than gender alone. Furthermore, Chen et al. (2023) demonstrated the importance of gender inequality and gender-role attitudes in understanding subjective well-being, while Blanchflower and Bryson (2024) highlighted differences in positive and negative emotional experiences between men and women. Collectively, these studies suggest that gender differences should be interpreted within broader social and developmental contexts. In relation to Industry 4.0, this interpretation becomes particularly relevant because technological transformation introduces additional environmental demands that may influence each psychological well-being dimension differently. Therefore, the proposed framework considers gender as an important contextual characteristic associated with psychological well-being while recognising that its relationship with well-being may depend on the interaction between individual circumstances, workplace conditions, and access to supportive resources (Babnik et al., 2022; Ryff and Keyes, 1995; Ryff, 1989).

The synthesis further indicates that Industry 4.0 introduces new psychological demands that may influence employees' well-being through technological complexity, continuous connectivity, changing job responsibilities, and uncertainty surrounding future employment. Although digital transformation can improve organisational productivity, workplace flexibility, and operational efficiency, these benefits may be accompanied by increased cognitive demands and difficulties maintaining boundaries between professional and personal responsibilities. Kumar (2024) discusses technostress as an important concern associated with technological changes, particularly when employees experience information overload, difficulties adapting to new digital systems, or uncertainty about technological expectations. From the perspective of the Job Demands–Resources Theory, these pressures can be interpreted as additional job demands requiring sustained cognitive and emotional effort. When workplace demands consistently exceed employees' available resources, the likelihood of psychological strain and reduced well-being may increase. Conversely, adequate organisational support, training opportunities, autonomy, and effective communication may help employees adapt to technological changes and maintain positive psychological functioning. Bakker and Demerouti (2007) explain that job demands and resources operate through different processes that influence employee well-being and occupational outcomes, building upon the earlier model developed by Demerouti et al. (2001). Applying this theoretical perspective to Industry 4.0 suggests that technology itself should not automatically be considered harmful to psychological well-being. Instead, its consequences depend partly on how technological systems are introduced, the expectations placed on employees, and the resources available to support adaptation. Employees experiencing technological changes without adequate guidance may perceive digitalisation as an additional source of uncertainty, whereas those receiving sufficient support may experience greater competence and control. Consequently, the

conceptual findings suggest that psychological well-being within Industry 4.0 should be examined through the relationship between technological demands and organisational resources rather than through technological exposure alone. This distinction provides an important theoretical basis for understanding why employees working within similar digital environments may experience different levels of psychological well-being.

An important outcome of the conceptual synthesis concerns the possibility that technological transformation creates unequal psychological demands and opportunities for men and women. Gender differences in digital workplaces may emerge from differences in occupational responsibilities, access to technological resources, opportunities for professional development, and expectations surrounding digital competence. Makowska-Tłomak et al. (2026) examined gender differences in stress associated with workplace digital transformation and highlighted the potential importance of technological self-efficacy and gender-related expectations. Their findings suggest that employees with comparable technological abilities may nevertheless experience digital transformation differently when their confidence and perceptions of technological competence differ. However, the limited sample associated with their psychometric investigation means that these observations should be interpreted cautiously rather than generalised across all workplaces. Broader structural concerns are also relevant to gender differences in technological employment. Brussevich et al. (2018) discussed how occupational segregation and exposure to routine tasks may create different risks and opportunities for men and women as automation expands. Their analysis suggests that technological development can influence employment experiences differently depending on the nature of workers' existing responsibilities and access to new opportunities. When considered alongside the Job Demands–Resources framework, these findings indicate that gender differences in psychological well-being may partly reflect unequal exposure to job demands and unequal access to resources rather than differences in technological capability alone. For example, limited training opportunities may increase uncertainty and reduce perceived environmental mastery, while supportive management and professional development may strengthen autonomy and personal growth. Accordingly, the proposed conceptual framework does not assume that all women experience greater technostress or that all men possess stronger technological confidence. Instead, it suggests that gender may be associated with different experiences of workplace digitalisation through occupational and organisational circumstances. Understanding these contextual differences is particularly important for developing workplace strategies that promote equitable access to technological learning, organisational support, and psychological well-being.

The integration of Ryff's psychological well-being model with the Job Demands–Resources Theory provides a conceptual explanation of how technological workplace conditions may be associated with gender differences across six dimensions of well-being. Ryff's model identifies autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance as distinct but related components of positive psychological functioning (Babnik et al., 2022; Ryff and Keyes, 1995; Ryff, 1989). Within Industry 4.0, autonomy may be influenced by employees' control over digital workloads, working arrangements, and technological decisions. Environmental mastery may reflect employees' ability to manage changing digital systems and maintain confidence when adapting to unfamiliar work requirements. Personal growth may be supported through technological learning, professional development, and opportunities to acquire new competencies. Positive relations with

others may depend on the quality of workplace communication, social support, and interpersonal relationships in increasingly digital environments. Purpose in life may relate to employees' perceptions that their work remains meaningful despite automation and changes in occupational responsibilities, while self-acceptance may be influenced by confidence in individual abilities and responses to technological expectations. These proposed relationships are consistent with the broader argument that workplace demands and resources influence psychological functioning through the conditions employees encounter (Bakker and Demerouti, 2007; Demerouti et al., 2001). Furthermore, García-Castilla et al. (2020) demonstrated the relevance of gender and relationship circumstances to different aspects of psychological well-being, supporting the importance of examining individual dimensions rather than relying exclusively on general well-being scores. Nevertheless, the relationships proposed in the present framework remain conceptual and have not been empirically tested within the study. Therefore, the integration of these theories should be understood as a basis for identifying potential pathways rather than evidence of established causal relationships. Future empirical research can examine whether different technological demands and organisational resources are associated with specific psychological well-being dimensions among male and female employees.

The overall discussion highlights the importance of adopting a gender-sensitive and human-centred approach to psychological well-being in Industry 4.0 workplaces. The reviewed literature indicates that gender differences are shaped by the interaction of individual characteristics, social expectations, developmental experiences, and environmental conditions. For instance, Chen et al. (2023) emphasised the relationship between gender inequality, gender-role attitudes, and subjective well-being, while Yoon et al. (2023) and Tomé et al. (2021) illustrated how gender-related well-being experiences may differ during adolescence. Research involving adult populations further suggests that psychological well-being is influenced by personal and social resources, including confidence, self-esteem, and supportive relationships (Matud et al., 2022; Matud et al., 2020). When these findings are considered alongside workplace digitalisation, they suggest that organisational strategies should extend beyond technological efficiency to address employees' psychological and developmental needs. Technological training, accessible professional development, supportive leadership, reasonable workload expectations, and opportunities for employee participation may represent useful resources for reducing workplace strain. The importance of these resources is consistent with the Job Demands–Resources Theory, which emphasises the relationship between working conditions and employee well-being (Bakker and Demerouti, 2007; Demerouti et al., 2001). Nevertheless, the proposed conceptual framework has several limitations. First, the study relies on secondary literature and does not provide empirical measurements of gender differences among employees working in Industry 4.0 environments. Second, the existing studies involve different populations, age groups, and research settings, limiting direct comparisons between their findings. Third, the framework has not established whether gender directly predicts psychological well-being or whether organisational demands and resources explain potential differences. Consequently, future studies should employ quantitative or mixed-method research designs involving employees from different industries to examine these relationships. Overall, the conceptual synthesis contributes an integrated perspective that connects gender, technological workplace demands, organisational resources, and

multidimensional psychological well-being, offering a foundation for future empirical investigation and more inclusive workplace practices.

Conclusion

This concept paper discusses the relationship between gender and psychological well-being in the context of Industry 4.0. Based on the review of previous studies, the paper shows that gender differences in psychological well-being exist, but these differences are not the same in every area or at every stage of life (Blanchflower and Bryson, 2024; Yoon et al., 2023; Matud et al., 2022; Tomé et al., 2021; Matud et al., 2020). Factors such as social support, self-esteem, confidence, workplace demands, and gender expectations also play an important role in shaping psychological well-being (Chen et al., 2023; Matud et al., 2022; Bakker and Demerouti, 2007). Industry 4.0 adds a new and still under-examined layer to this picture. Automation, artificial intelligence, and digital work systems have reshaped how, where, and when people work, and alongside the gains have come pressures such as technostress, information overload, the blurring of boundaries between work and home, and growing uncertainty about job security (Kumar, 2024; Brussevich et al., 2018). These changes can affect men and women differently depending on their roles, responsibilities, and access to resources (Makowska-Tłomak et al., 2026; Brussevich et al., 2018). Because men and women often hold different roles, carry different responsibilities, and have different levels of access to training and technological resources, the same wave of change may reach them in different ways (Makowska-Tłomak et al., 2026; Brussevich et al., 2018). Understanding well-being in this setting therefore cretae a framework that can capture both the pressures of the modern workplace and the resources people can draw on to cope with them. Using the Job Demands-Resources Theory, this paper explains that psychological well-being is influenced by the balance between work demands and the resources available to employees (Bakker and Demerouti, 2007; Demerouti et al., 2001). This makes the theory useful in understanding gender differences in psychological well-being in a changing work environment. Overall, this concept paper provides a useful framework for understanding how gender could influence psychological well-being in the era of Industry 4.0. The paper also highlights the need for future studies to further examine this issue in different workplace settings. The findings of this concept paper may help researchers, employers, and policy makers develop better strategies, support systems, and interventions to promote psychological well-being among employees regardless of gender.

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Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper. The authors confirm that there is no financial, professional, or personal conflict of interest involving any individual, organization, or institution in relation to this research. The study was conducted with full academic independence, and no relationships or affiliations exist that could have influenced, or be perceived to have influenced, the findings, interpretations, or conclusions presented in this paper

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