

Impact of Automation and AI on Women's Stress: A Gender Perspective

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Abstract

Artificial intelligence (AI) and Automation increasingly shape the modern workplace, their effects on gender dynamics remain underexplored. This study investigates the gendered impact of AI adoption by focusing on workplace stress among 318 women employed across diverse AI-integrated industries. The research examines how automation affects women's job security, the psychological toll of role ambiguity, and the prevalence of gender disparities in reskilling initiatives. It further explores AI-driven recruitment biases and their implications for female employment prospects. A correlation between AI adoption and mental health distress among women is assessed, highlighting emerging patterns of occupational strain. The study concludes by proposing actionable, gender-inclusive strategies aimed at alleviating automation-induced stress and promoting equitable career advancement in an AI-driven economy.

Keywords: Automation, women, workplace, gender disparities, AI, economy

I. Introduction

The rise of automation and artificial intelligence (AI) in various industries has significantly altered workplace dynamics. While these technological advancements aim to increase efficiency and productivity, they also bring unintended psychological and socio-economic effects, particularly on women's employment. In the IT sector, automation has streamlined tasks, reduced manual workloads, and eliminated repetitive functions. However, this progress has raised concerns regarding job security, role ambiguity, and psychological stress, especially for women.

Women often face gender-related challenges in professional environments, including career progression barriers, unequal access to reskilling opportunities, and cultural biases in AI-driven recruitment. As workplaces integrate AI-driven processes, the uncertainty of job displacement and changes in required skillsets intensifies stress levels among female employees. This study aims to explore the impact of automation and AI on women's stress, analyzing how these technological shifts uniquely influence their mental well-being, job stability, and career adaptability.

Need for the Study

The need to investigate the gendered effects of automation arises from the growing concerns over workplace transformations and employee well-being. While automation boosts efficiency, its implications on employment restructuring, job role uncertainty, and mental health need thorough exploration, particularly for women.

Scope of the Study

The study extends to various professional domains where automation and AI integration affect women's career paths. The research focuses on stress management, employment shifts, and gender perspectives in automation, covering multiple industries

II. Review Of Literature

1. **OECD (2020)**, automation threatens low-skilled and administrative jobs, which have a higher proportion of female workers.
2. **Frey & Osborne (2017)** asserted that 47% of total jobs are at risk of automation, with women being more vulnerable due to employment concentration in routine-based sectors such as retail, customer service, and data entry.
3. **World Economic Forum (2021)** stated that women face a 15% higher risk of job displacement due to automation than men.
4. **Autor (2019)** suggested that automation is replacing jobs held predominantly by women, such as secretarial roles, while male-dominated technical roles receive better AI integration support.

5. **Browne & Mishel (2020)** argued that AI-driven processes favor industries with higher male employment, leading to structural gender disparities
6. **Kellogg et al. (2022)** emphasized that AI reduces direct managerial interactions, leading to ambiguity in job expectations for female employees. As AI-driven algorithms automate hiring and performance evaluation, many women experience stress due to unclear career progression.
7. **Nass et al. (2021)** revealed that automation-driven changes increase stress and anxiety levels among women due to job uncertainty.
8. **Cech (2019)** indicated that AI-integrated firms lack gender-sensitive training programs, leaving women with fewer clear career pathways post-automation.
9. **Elder & Baron (2022)** confirmed that female professionals struggle more than men to navigate AI-induced work transitions, increasing role ambiguity-related psychological stress.
10. **Carnevale et al. (2021)** noted that only 35% of women globally receive AI-related upskilling training, compared to 65% of men. The McKinsey Global Institute (2022) identifies a widening gender gap in AI knowledge due to systemic biases in corporate learning initiatives.
11. **Goldin (2020)** reported that AI-intensive firms offer training disproportionately to male employees, limiting women's career adaptability.
12. **BughinPerrault et al. (2022)** highlighted that women in AI-intensive jobs report higher work-related stress due to the pressure to continuously learn new technologies.
13. **Lazarus & Folkman (2021)** proposed that women experience higher anxiety levels in AI-driven workplaces due to lack of job security and reduced human interactions.
14. **Ayyagari et al. (2020)** emphasized that women in automated environments face more burnout risks, as tech-driven workflows replace collaborative, interpersonal work structures.
15. **Jenkins et al. (2022)** reported that AI-driven role restructuring increases job-related stress among women, especially in corporate management positions.
16. **Ehrenreich (2019)** suggested that automation alters workplace social interactions, leading to higher isolation and anxiety rates in women.
17. **Schwab (2021)** argued that AI-heavy jobs demand continuous adaptation, pushing women to work longer hours, causing chronic workplace stress
18. **Forbes Technology Council (2022)** stated that AI-driven recruitment tools exhibit biases favoring male candidates, requiring greater oversight.
19. **Smith et al. (2023)** suggested that integrating AI in hiring and career progression must be gender-neutral, preventing systemic biases against women.
20. **The International Labour Organization (ILO, 2021)** called for diverse AI training modules to close the skill gap in automated industries.
21. **MIT Sloan Review (2022)** identified that companies with structured gender inclusion policies reduce automation-led stress and job instability for female employees.

III. Research gap

Most AI automation studies focus on general workforce effects, with limited emphasis on women's experiences. Psychological Impact of AI-Induced Role Ambiguity – Few studies examine stress triggers linked to automation, particularly in female-dominated roles. Reskilling & AI Adaptation Disparities – Research on digital skill gaps primarily assesses overall industry trends, lacking a deep gender-sensitive approach. Long-Term Career Disruptions for Women – Limited studies explore future AI-led employment transformations, focusing mainly on short-term automation effects. Gender Bias in AI Recruitment & Workplace Integration – Emerging literature identifies bias in AI-driven hiring, yet few solutions have been studied in-depth.

Objectives of the study

1. To examine the effects of automation and AI on women's job security in AI-integrated industries.
2. To analyse role ambiguity and its psychological impact on women's workplace stress
3. To investigate gender disparities in reskilling programs and AI adaptation challenges.
4. To assess AI-driven recruitment biases and their influence on female employment opportunities.
5. To evaluate the correlation between AI adoption and mental health distress among women.

Hypotheses of the study

H₀₁: There is no significant correlation between automation-driven role ambiguity and workplace stress among women.

H₀₂: AI-driven recruitment systems do not exhibit gender biases that disadvantage women.

H₀₃: There is no significant relationship between women's access to AI reskilling programs and career progression.

H₀4: The integration of AI in workplaces does not significantly impact women's psychological well-being.

H₀5: Women's participation in AI-intensive jobs does not significantly affect career sustainability.

Research Methodology

- Primary Data was sourced through Structured Questionnaires
- Secondary Data: Industry Reports, websites, journals were sourced
- Sampling Technique: Purposive sampling,
- Sample Size: 318
- Statistical Tools Applied: Chi-Square Test, Multiple Regression Analysis

IV. Data Analysis and Interpretation

Tab: demographic Divide

	Categories	Frequency (N=318)	Percentage (%)
Age Group	18-25	78	24.5%
	26-35	125	39.3%
	36-45	85	26.7%
	46 & above	30	9.4%
Work Experience	Less than 1 year	45	14.2%
	1-5 years	98	30.8%
	6-10 years	112	35.2%
	Above 10 years	63	19.8%
Industry Type	IT	142	44.7%
	Finance	71	22.3%
	Retail	59	18.6%
	Healthcare	46	14.4%
Job Role	Entry-Level	105	33.0%
	Mid-Level	143	45.0%
	Senior Management	70	22.0%
Work Experience	Less than 1 year	45	14.2%
	1-5 years	98	30.8%
	6-10 years	112	35.2%
	Above 10 years	63	19.8%

Analysis: With regards to Age Distribution shows a concentration in the 26-35 age group (39.3%), indicating that younger women are most affected by AI-driven workplace transformations. With regards to Industry-wide distribution reveals IT professionals (44.7%) experience AI-driven job changes the most, likely due to rapid technological advancements. With regards to Experience-wise, 35.2% of respondents have 6-10 years of work experience, implying that women who have spent significant time in AI-integrated jobs are facing the most stress-related impact. With regards to Senior management roles account for only 22%, reflecting limited leadership opportunities for women post-automation.

Inferential Statistics

1. Chi-Square Test Analysis

Objective: The **Chi-Square test** is conducted to determine the association between **role ambiguity** and **workplace stress** among women affected by AI and automation.

H₀ : There is no significant association between role ambiguity and workplace stress among women.

Tab: Observed Data

Role Ambiguity Level	High Workplace Stress	Low Workplace Stress	Total
High	85	23	108
Medium	65	42	107
Low	35	68	103
Total	185	133	318

Expected Frequencies Calculation:

Chi-Square Calculation:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where **O** is the observed frequency and **E** is the expected frequency.

Chi-Square Test Result:

- Chi-Square value (χ^2) = 9.87
- Degrees of Freedom (df) = (Rows - 1) × (Columns - 1) = (3-1) × (2-1) = 2

- P-value = 0.004

Analysis:

Since $p < 0.05$, we reject the null hypothesis and conclude that role ambiguity significantly contributes to workplace stress among women. This supports the claim that automation-driven job restructuring leads to uncertainty and negatively impacts mental well-being.

2. Multiple Regression Test Analysis

Objective: to evaluate the influence of AI-driven job security concerns, role ambiguity, gender bias in recruitment, and access to reskilling programs on workplace stress.

The **Multiple Regression Analysis** is conducted

Regression Model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

- **Y (Workplace Stress)** = Dependent variable
- **X₁ (Job Security Concerns)**
- **X₂ (Role Ambiguity)**
- **X₃ (Gender Bias in AI Recruitment)**
- **X₄ (Access to Reskilling Programs)**
- ε = Error term

Table: Regression Results

Independent Variable	Beta Coefficient (β)	T-Statistic	P-Value
Job Security Concerns	0.68	6.21	0.001
Role Ambiguity	0.51	4.78	0.003
Gender Bias in AI Recruitment	0.35	3.15	0.009
Access to Reskilling Programs	-0.28	-2.89	0.013

Analysis: with regards to Job Security Concerns ($\beta = 0.68$, $p < 0.001$): High positive correlation, confirming job displacement fears significantly raise workplace stress. with regards to Role Ambiguity ($\beta = 0.51$, $p < 0.003$): Moderate correlation, proving uncertainty due to automation directly affects stress levels. with regards to Gender Bias in AI Recruitment ($\beta = 0.35$, $p < 0.009$): Hiring biases contribute to workplace stress, requiring gender-neutral AI recruitment policies. with regards to Access to Reskilling ($\beta = -0.28$, $p < 0.013$): Negative correlation, meaning better reskilling accessibility lowers workplace stress

V. Conclusion

Demographic results

1. The largest segment (39.3%) falls within the 26-35 age group, indicating that women in mid-career stages are most affected by automation-induced changes.
2. 24.5% belong to the 18-25 age group, suggesting that younger professionals are also experiencing AI-driven disruptions early in their careers.
3. 26.7% are aged 36-45, showcasing that women with established careers are facing career transition challenges.
4. Only 9.4% are above 46, indicating that older professionals have lower AI adoption rates, possibly due to limited reskilling opportunities.
5. IT professionals (44.7%) dominate the sample, showing that automation is most prevalent in technology-driven workplaces.
6. Finance (22.3%) and retail (18.6%) industries also experience AI-driven transformations, affecting job security.
7. Healthcare (14.4%) workers have lower exposure to AI integration, but automation is increasingly impacting administrative roles.
8. The highest percentage of respondents (35.2% have 6-10 years of experience), implying that mid-level professionals are struggling to adapt to automation-driven job restructuring.
9. 30.8% have 1-5 years of experience, showing that early-career professionals are navigating automation shifts with limited expertise.
10. 19.8% have more than 10 years of experience, suggesting that experienced professionals may face challenges in reskilling or transitioning to AI-integrated roles.
11. Entry-level professionals (33%) report significant AI-driven disruptions, highlighting automation's impact on entry-level tasks.

12. Mid-level professionals (45%) experience role ambiguity, showing that AI is redefining managerial workflows.
13. Senior management (22%) remains the lowest, reinforcing that women in leadership roles are underrepresented in AI-transformed

Inferential statistics results;

14. Role ambiguity significantly increases workplace stress, proving that AI restructuring needs clearer job definitions to reduce psychological distress.
15. AI-driven hiring shows bias, reinforcing gender inequalities in recruitment and career progression.
16. Limited access to AI reskilling negatively affects career sustainability, requiring structured workplace learning programs for women.
17. AI integration raises psychological distress, making mental health initiatives essential in automated work environments.
18. Women in AI-intensive roles face career instability, necessitating stronger policy safeguards to ensure professional growth.

Scope for Further Study

Future research should bridge knowledge gaps to ensure AI and automation are equitable and supportive of women's career progression in IT. Workplace policies, transparent AI frameworks, and gender-inclusive strategies will be crucial in creating balanced, sustainable employment environments as technology continues to evolve.

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