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REVIEW PAPER

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A CRITICAL ANALYSIS OF THE CHANGES IN THE WORKING CONDITIONS AND MENTAL STATE OF INDUSTRIAL WORKERS AFTER COVID-19. (IN THE CONTEXT OF BIJAULI INDUSTRIAL AREA)

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Abstract: COVID-19 pandemic has severely affected the social and economic life at the global level. In particular, the lives of industrial workers have experienced significant changes at both work and mental health levels due to this pandemic. This research paper focuses on the industrial workers of the Jhansi region, with the objective of identifying whether any notable changes have occurred in their working conditions and mental health after COVID-19.In this study, data were collected through surveys and interviews, and Chi-Square (χ^2) tests were used to examine the hypotheses. The analysis clearly revealed that after the pandemic, major changes occurred in workplace situations such as the working environment, work hours, safety facilities, wage structure, and workers' mental health conditions including stress, anxiety, and uncertainty.

COVID-19 has had a strong impact on the work experience and mental health of industrial workers. This research provides useful suggestions for policymakers and industrial managers regarding the types of strategies that should be adopted in the future to improve workers' safety and mental well-being.

Keywords: Covid 19, Industrial labour, Mental health, Depression, security, working condition

1 INTRODUCTION

Industrial workers are backbone of the economic structure of any country. They contribute to the growth of industries by working in factories, production units, construction sites, and various manufacturing sectors[1]. However, the working conditions of these labourers are often highly challenging. Poor workplace safety, insecure employment, inadequate wages, lack of health services, and limited social security—these factors severely affect the mental health of industrial workers[2]. After the COVID-19 pandemic, these conditions changed drastically, resulting in a significant negative impact on their psychological well-being.

The quality of the workplace directly affects workers' productivity, life satisfaction, and mental health[3]. In many industrial sectors in India, workers frequently have to work 10 to 12 hours a day, often without adequate safety measures and without receiving timely wages.

M. S. R. Shyam Sundar, in his book "The Pandemic and the Workers: Impact of COVID-19 on Labour Market", states that the pandemic made the already fragile working conditions of workers even more unstable. Due to lockdowns, a decline in output, and cost-reduction policies, workers had to face reduced wages, irregular working hours, and job insecurity[4]. According to Sundar, "An uncertain work environment creates mental instability, which over time can cause loneliness, anxiety, and social isolation[5]." Long working hours, abusive behaviour from supervisors, lack of rest, and family pressures are the root causes of mental stress among workers.

According to the World Health Organization (WHO) 2022 report "Mental Health and Work," one out of every five workers globally suffers from some form of mental health issue[6]. The report highlights that negative work environments[7], lack of safety, high work pressure, and inadequate support from managers create mental stress among employees.

The International Labour Organization (ILO) report "Ensuring Safety and Health at Work in a Changing Climate" explains that continuous work[8], lack of proper ventilation, and poor work–life balance worsen mental health[9]. Women workers—who manage both household and workplace responsibilities—face even higher levels of stress.

2 REVIEW OF PREVIOUS STUDY

Farzana Afridi, Amrita Dhillon, and Sanchari Roy (2021) use data from before the COVID-19 pandemic (May–July 2019) and during the pandemic (April–May 2020) to document the effects of the pandemic on employment and mental health among poor households and individuals in urban India. By conducting their own survey data on employment conditions and psychological responses, and analyzing husband–wife paired data, they estimate how these impacts differ by gender. Based on emerging evidence, they predict a large negative shock to men's employment status immediately after the nationwide lockdown halted economic activity, compared to the pre-pandemic period. Along with this, there was a significant decline in men's monthly income. In contrast, women's employment did not experience a major impact. However, despite limited quantitative evidence on psychological distress, almost all developing countries—including India—show extremely adverse mental health effects during the pandemic. Due to heightened financial and health-related anxieties (especially greater among women than men), this study documents significant psychological impacts, contributing to the growing global literature[6]. Pamidimukkala and Kermanshachi (2021) state that worries, anxiety, and even suicidal thoughts during COVID-19 arise due to factors such as extreme workload, high job pressure, difficult personal circumstances, and lack of employment security. Their findings suggest that workplace safety can be strengthened through appropriate use of protective equipment, ensuring safe distancing among workers, sanitization, hand hygiene, and effective implementation of preventive techniques. Such measures can improve project productivity while ensuring worker safety. They identified key strategies needed to overcome these challenges[4].

Brooks et al. (2020) report, based on current psychological research, that mental health issues worsen during and after a pandemic. These include post-traumatic stress disorder (PTSD), stress, depression, and anxiety—conditions particularly common among quarantined individuals. These psychological impacts do not fade immediately after the pandemic; instead, they have long-term effects on emotional and mental stability. Carranza et al. (2020) found that during COVID-19, women faced increased household burdens as well as employment insecurity due to economic stress. In sectors such as education, health services, hospitality, and retail—where women are disproportionately employed—the lockdown and associated restrictions led to widespread job losses. Additionally, for women working in informal sectors without access to adequate social protection, the situation became even more severe. This significantly affected their economic and mental well-being[8]. According to Salari et al. (2020), COVID-19 impacted not only physical health but also seriously affected the mental health of labor groups. Economic instability, unemployment, and income reduction worsened psychological stress and anxiety among workers during the pandemic[2].

1.1 Research Objectives

- **Assessment of Changes in the Work Environment:** To examine the impact of COVID-19–induced changes (such as lockdowns, remote work, reduced working hours, or unemployment) on the working conditions of industrial workers—specifically job security, workload, and workplace safety measures.
- **Evaluation of Mental Health Outcomes:** To assess the prevalence and severity of mental health issues—such as anxiety, depression, stress, and burnout—among industrial workers during and after the COVID-19 pandemic.
- **Identification of Risk and Protective Factors;** To identify the factors that contribute to mental health challenges (such as financial insecurity, workload pressure, social isolation) as well as the protective factors (such as social support and organizational interventions) influencing workers' psychological well-being.
- **Analysis of Socio-Economic Impacts:** To analyze the socio-economic effects of the pandemic (such as reduced income, job loss, or changes in employment conditions) and evaluate their influence on the mental health of industrial workers.

3 RESEARCH DESIGN AND METHODOLOGY

In this research, both qualitative and quantitative types of research designs have been adopted so that the impact of COVID-19 on industrial workers' working conditions and mental health can be analyzed. For this purpose, data were collected by selecting a total sample of 600 industrial workers. The data actually obtained reflects the workers' conditions and their personal experiences using both documentary evidence and responses, making use of both methodologies. This data is helpful in examining factors such as lockdown, workplace safety, wages, and the levels of stress, anxiety, depression, and burnout experienced by workers during the work process.

The data was analyzed using the Chi-square test. Through this method, the extent of association or significant common changes among the variables and working conditions can be assessed. The Chi-square test helps determine whether the changes caused by COVID-19 have a significant effect on the mental and quantitative conditions of industrial workers or not. Hence, the qualitative sources and quantitative data analysis obtained in this research provide supportive and reliable insights into understanding the workers, leaving no other alternative for accurate research interpretation.

4 RESEARCH HYPOTHESIS

- **Changes in Working Conditions: H_0: There is no significant change in the working conditions of industrial workers after COVID-19.**
- **COVID-19 and Mental Health: H_0: There is no significant impact on the mental health of workers after COVID-19.**

1.2 Statistical Testing and Interpretation

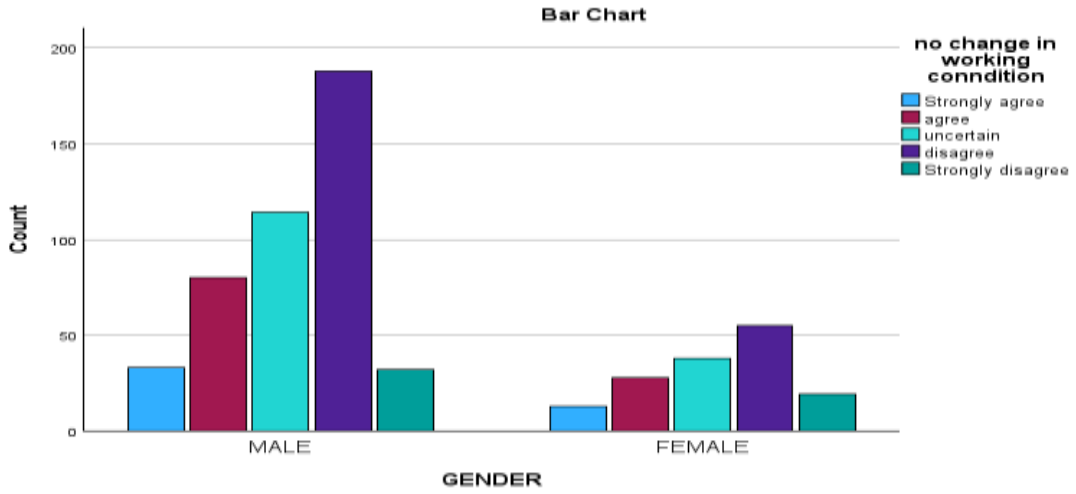
Hypothesis: 1

A "There is no change in my working conditions after COVID-19"

Table 1.1

Cross tab								
			No change in working condition					
			Strongly agree	agree	uncertain	disagree	Strongly disagree	Total
GENDER	MALE	Count	33 (7.4%)	80 (17.9%)	114 (25.5%)	188 (42.1%)	32 (7.2%)	447 100%
		Expected Count	34.3	80.5	113.2	181.0	38.0	447.0
	FEMALE	Count	13 (8.5%)	28 (18.3%)	38 (24.8%)	55 (35.9%)	19 (12.4%)	153 100%
		Expected Count	11.7	27.5	38.8	62.0	13.0	153.0

Graph 1.1



According to the findings of the study, industrial workers experienced noticeable changes in their working conditions after COVID-19, which significantly influenced their employment security. When the assessment was made regarding whether there was *no* change in working conditions, the responses showed clear disagreement among 42.1% of male workers and 35.9% of female workers. In contrast, 25.5% of male workers and 24.8% of female workers expressed certainty that significant changes had indeed occurred. These results reflect that a considerable proportion of workers observed alterations in their work environment after the pandemic, leading to increased concerns about job stability.

Table 1.2

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.975a	4	.290
Likelihood Ratio	4.705	4	.319
N of Valid Cases	600		

There is no change in working conditions 42.1% of male workers and 35.9% of female workers agreed with this statement, which indicates that a majority of workers experienced little to no change. However, the Chi-Square test yielded a p-value of 0.290, which is greater than 0.05.

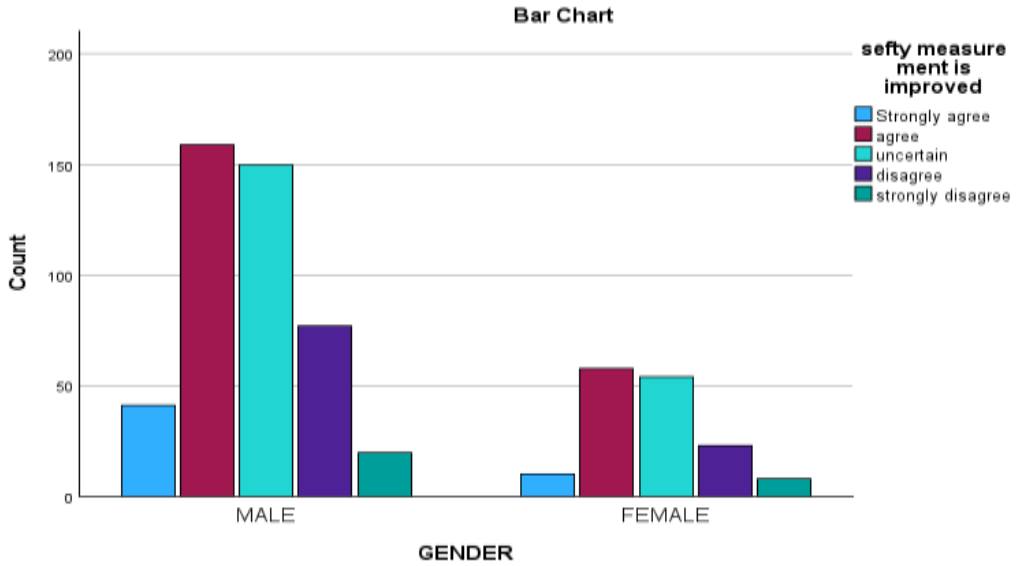
B: "After the pandemic, the safety standards at my workplace have improved

Table 1.3

			sefty measure ment is improved					
			Strongly agree	agree	Un certain	Dis agree	strongly disagree	Total
GENDER	MALE	Count	41 (9.2%)	159 (35.6%)	150 (33.6%)	77 (17.2%)	20 (4.5%)	447 (100%)
		Expected Count	38.0	161.7	152.0	74.5	20.9	447.0

	FEMALE	Count	10 (6.5%)	58 (37.9%)	54 (35.3%)	23 (15.0%)	8 (8.2%)	153 (100%)
		Expected Count	13.0	55.3	52.0	25.5	7.1	153.0
Total		Count	51 (8.5%)	217 (36.2%)	204 (34.0%)	100 (16.7%)	28 (4.7%)	600 (100%)
		Expected Count	51.0	217.0	204.0	100.0	28.0	600.0

Graph 1.2



"In the analysis related to improvements in safety measures, it was found that **35.6% of male workers and 37.9% of female workers agreed** with the statement that safety measures had improved. On the other hand, **33.6% of male workers and 35.3% of female workers were uncertain**."

Table 1.4

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.673a	4	.796
Likelihood Ratio	1.730	4	.785
N of Valid Cases	600		

35.6% of male workers and 37.9% of female workers agreed that safety measures had improved. At the same time, 33.6% of male workers and 35.3% of female workers were uncertain.

However, the **p-value = 0.796**, which indicates that this change is **not statistically significant**.

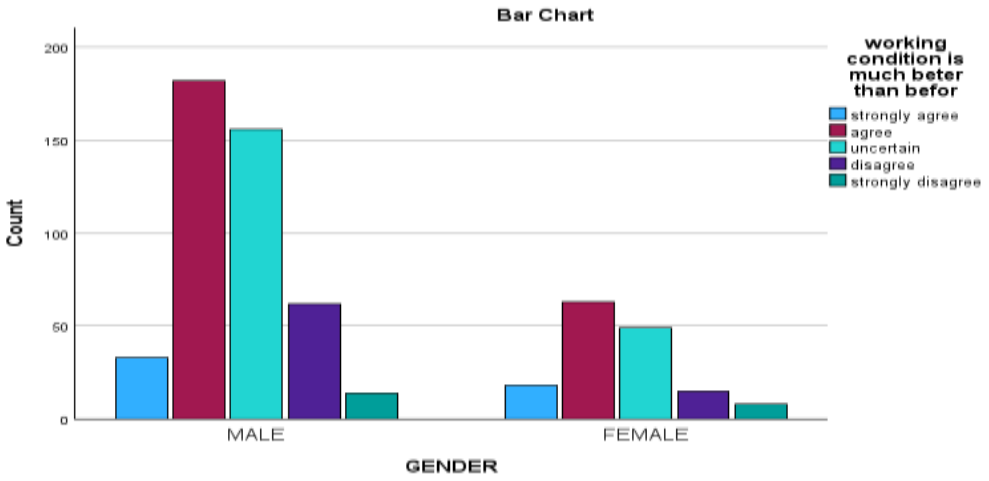
C: My working conditions have improved after COVID-19 as compared to before.

Table 1.5

Crosstab								
			working condition is much better than before					
			Strongly Agree	Agree	Un-certain	Dis-agree	Strongly Disagree	Total
GENDER	MALE	Count	33 (7.4%)	182 (40.7%)	156 (34.9%)	62 (13.8%)	14 (3.1%)	447 100%
		Expected Count	38.0	182.5	152.7	57.4	16.4	447.0
	FEMALE	Count	18 (11.8%)	63 (41.2%)	49 (32.0%)	15 (9.8%)	8 (5.2%)	153 100%
		Expected Count	13.0	62.5	52.3	19.6	5.6	153.0

Total	Count	51 (8.5%)	245 (40.8%)	205 (34.2%)	77 (12.8%)	22 (3.7%)	600 100%
	Expected Count	51.0	245.0	205.0	77.0	22.0	600.0

Graph 1.3



When the improvement in working conditions was examined, 40.7% of male workers and 41.2% of female workers agreed that their working conditions had become better after COVID-19. In contrast, 34.9% of males and 32.0% of females were uncertain

Table 1.6

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.692a	4	.223
Likelihood Ratio	5.506	4	.239
N of Valid Cases	600		

"Work conditions improved compared to before — 40.7% of male workers and 41.2% of female workers agreed with this statement, whereas 34.9% of male workers and 32.0% of female workers were not sure. However, the p-value = 0.223, which is greater than 0.05, indicating that this change is not statistically significant."

Hypothesis 2

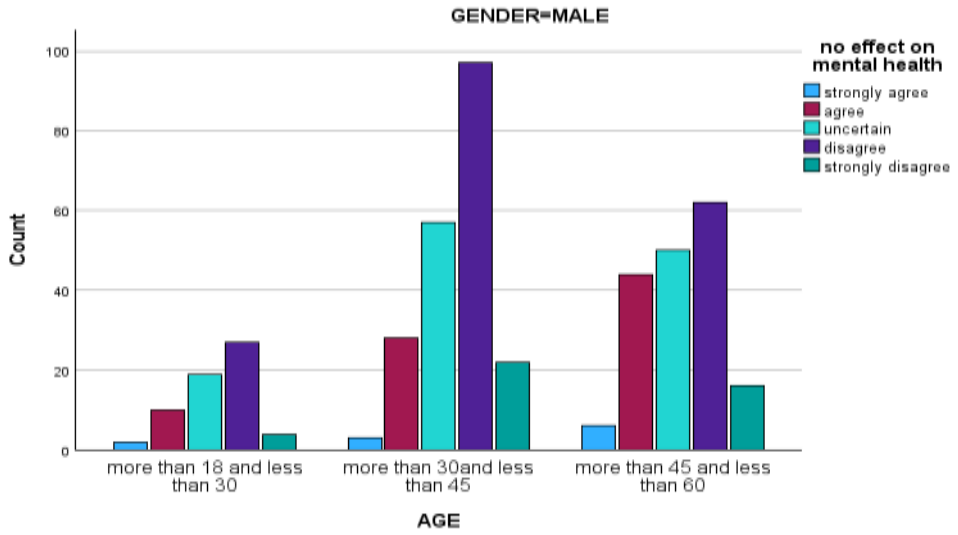
A: COVID-19, there has been no significant impact on my mental health."

Table 2.1

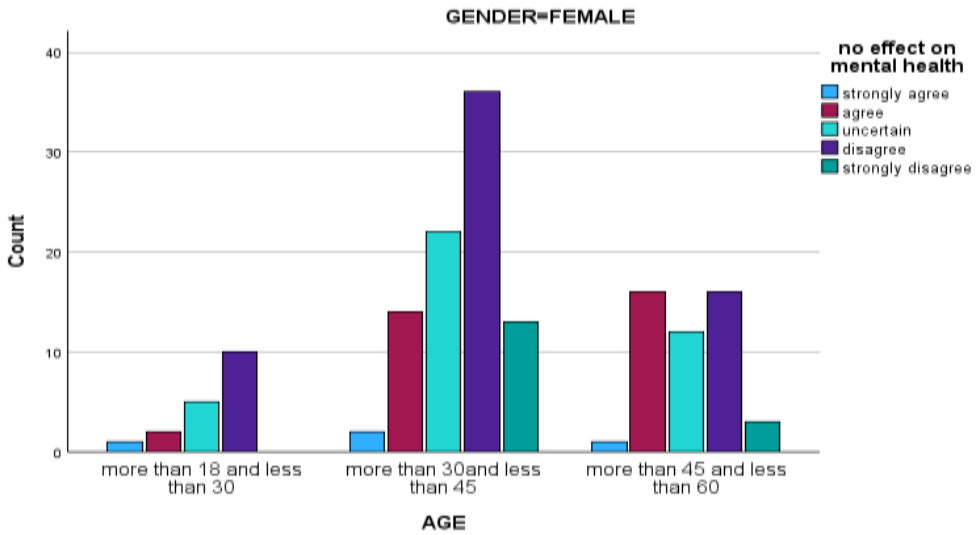
Crosstab									
				No effect on mental health					
GENDER				Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
MALE	AGE	more than 18 and less than 30	Count	2	10	19	27	4	62
			% of Total	0.4%	2.2%	4.3%	6.0%	0.9%	13.9%
		more than 30and less than 45	Count	3	28	57	97	22	207
			% of Total	0.7%	6.3%	12.8%	21.7%	4.9%	46.3%
		more than 45 and less than 60	Count	6	44	50	62	16	178
			% of Total	1.3%	9.8%	11.2%	13.9%	3.6%	39.8%
	Total		Count	11	82	126	186	42	447
			% of Total	2.5%	18.3%	28.2%	41.6%	9.4%	100.0%
FEMALE	AGE	more than 18 and less than 30	Count	1	2	5	10	0	18
			% of Total	0.7%	1.3%	3.3%	6.5%	0.0%	11.8%
		more than 30and less than 45	Count	2	14	22	36	13	87
			% of Total	1.3%	9.2%	14.4%	23.5%	8.5%	56.9%
		more than 45 and less than 60	Count	1	16	12	16	3	48
			% of Total	0.7%	10.5%	7.8%	10.5%	2.0%	31.4%

	Total		Count	4	32	39	62	16	153
			% of Total	2.6%	20.9%	25.5%	40.5%	10.5%	100.0%
Total	AGE	more than 18 and less than 30	Count	3	12	24	37	4	80
			% of Total	0.5%	2.0%	4.0%	6.2%	0.7%	13.3%
		more than 30and less than 45	Count	5	42	79	133	35	294
			% of Total	0.8%	7.0%	13.2%	22.2%	5.8%	49.0%
		more than 45 and less than 60	Count	7	60	62	78	19	226
			% of Total	1.2%	10.0%	10.3%	13.0%	3.2%	37.7%
	Total		Count	15	114	165	248	58	600
			% of Total	2.5%	19.0%	27.5%	41.3%	9.7%	100.0%

Graph 2.1



Graph 2.2



1.3 Impact on Mental Health

To assess the impact of the pandemic on mental health, workers were asked: Among the **18–30 years** age group, **43.5% of males** and **55.6% of females** disagreed with the statement. Similarly, in the **30–45 years** age group, **46.9% of males** and **41.4% of females** disagreed, and in the **45–60 years** age group, **34.8% of males** and **33.3% of females** also disagreed.

Overall, **41.3% of the total respondents** agreed that the pandemic had affected their mental health.

Table 2.2

Chi-Square Tests				
GENDER		Value	df	Asymptotic Significance (2-sided)
MALE	Pearson Chi-Square	12.830b	8	.118
	Likelihood Ratio	12.902	8	.115
	Linear-by-Linear Association	3.454	1	.063
	N of Valid Cases	447		
FEMALE	Pearson Chi-Square	12.058c	8	.149
	Likelihood Ratio	13.382	8	.099
	Linear-by-Linear Association	2.586	1	.108
	N of Valid Cases	153		
Total	Pearson Chi-Square	20.481a	8	.009
	Likelihood Ratio	20.513	8	.009
	Linear-by-Linear Association	5.735	1	.017
	N of Valid Cases	600		

"In the Chi-Square test, a p-value of 0.009 was obtained, which is less than 0.05. This means that after COVID-19, there is a statistically significant difference in the impact on mental health across different age groups and genders."

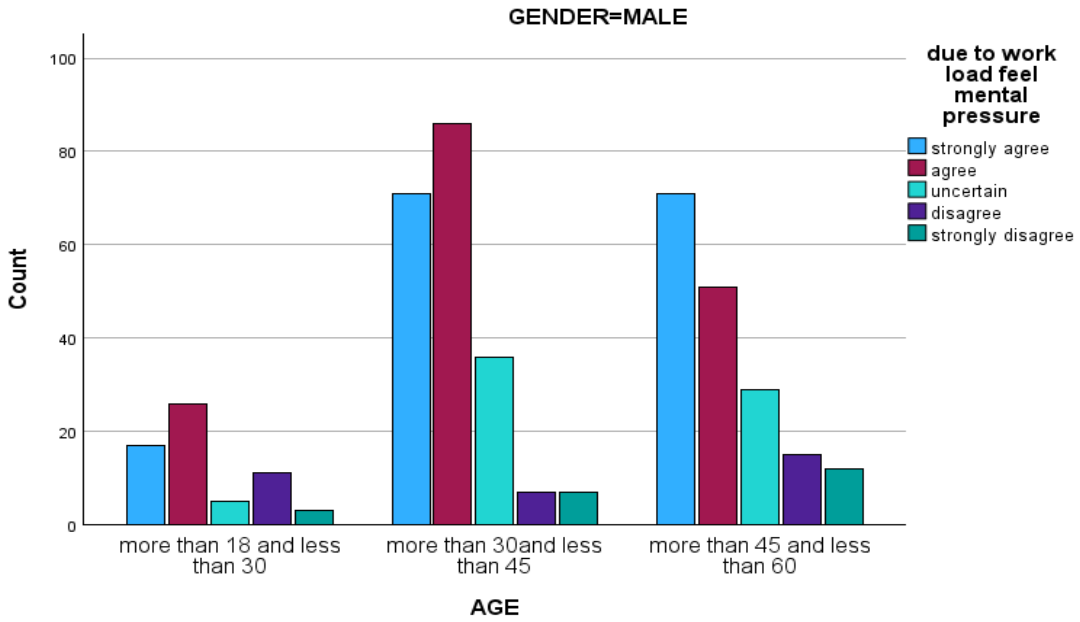
B: "After COVID-19, I feel mental stress due to the increased pressure of my work."

Table 2.3

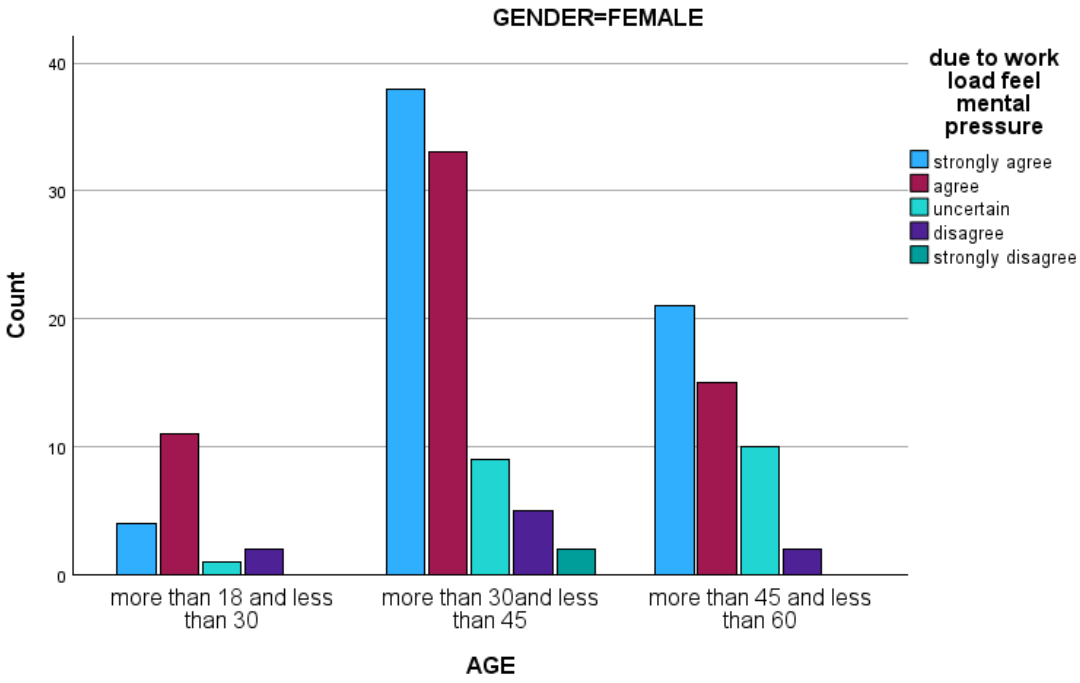
Crosstab									
				due to work load feel mental pressure					
GENDER				strongly agree	agree	uncertain	disagree	strongly disagree	Total
MALE	AGE	more than 18 and less than 30	Count	17	26	5	11	3	62
			% of Total	3.8%	5.8%	1.1%	2.5%	0.7%	13.9%
		more than 30and less than 45	Count	71	86	36	7	7	207
			% of Total	15.9%	19.2%	8.1%	1.6%	1.6%	46.3%
		more than 45 and less than 60	Count	71	51	29	15	12	178
			% of Total	15.9%	11.4%	6.5%	3.4%	2.7%	39.8%
	Total		Count	159	163	70	33	22	447
			% of Total	35.6%	36.5%	15.7%	7.4%	4.9%	100.0%
FEMALE	AGE	more than 18 and less than 30	Count	4	11	1	2	0	18
			% of Total	2.6%	7.2%	0.7%	1.3%	0.0%	11.8%
		more than 30and less than 45	Count	38	33	9	5	2	87
			% of Total	24.8%	21.6%	5.9%	3.3%	1.3%	56.9%
		more than 45 and less than 60	Count	21	15	10	2	0	48
			% of Total	13.7%	9.8%	6.5%	1.3%	0.0%	31.4%
	Total		Count	63	59	20	9	2	153
			% of Total	41.2%	38.6%	13.1%	5.9%	1.3%	100.0%
Total	AGE	more than 18 and less than 30	Count	21	37	6	13	3	80
			% of Total	3.5%	6.2%	1.0%	2.2%	0.5%	13.3%
		more than 30and less than 45	Count	109	119	45	12	9	294
			% of Total	18.2%	19.8%	7.5%	2.0%	1.5%	49.0%
		more than 45 and less than 60	Count	92	66	39	17	12	226
			% of Total	15.3%	11.0%	6.5%	2.8%	2.0%	37.7%

	Total	Count	222	222	90	42	24	600
		% of Total	37.0%	37.0%	15.0%	7.0%	4.0%	100.0%

Graph: 2.3



Graph 2.4



1.4 Due to work-related stress

In the second question, workers were asked: "After COVID-19, I feel psychological stress due to work pressure." The responses to this question clearly showed that there were differences in the levels of stress among different age groups. Among workers aged **18–30 years**, **27.4% males** and **22.2% females** completely agreed with this statement. Workers aged **30–45 years**, **34.3% males** and **43.7% females** agreed, while among those aged **45–60 years**, **39.9% males** and **43.8% females** also expressed agreement. Overall, more than **74% of respondents** accepted that they are experiencing psychological stress due to increased work pressure after COVID-19

Table 2.4

Chi-Square Tests				
GENDER		Value	df	Asymptotic Significance (2-sided)
MALE	Pearson Chi-Square	25.825b	8	.001
	Likelihood Ratio	25.090	8	.002
	Linear-by-Linear Association	.145	1	.703
	N of Valid Cases	447		
FEMALE	Pearson Chi-Square	10.909c	8	.207
	Likelihood Ratio	11.416	8	.179
	Linear-by-Linear Association	.343	1	.558
	N of Valid Cases	153		
TOTAl	Pearson Chi-Square	28.721a	8	<.001
	Likelihood Ratio	27.671	8	<.001
	Linear-by-Linear Association	.249	1	.618
	N of Valid Cases	600		

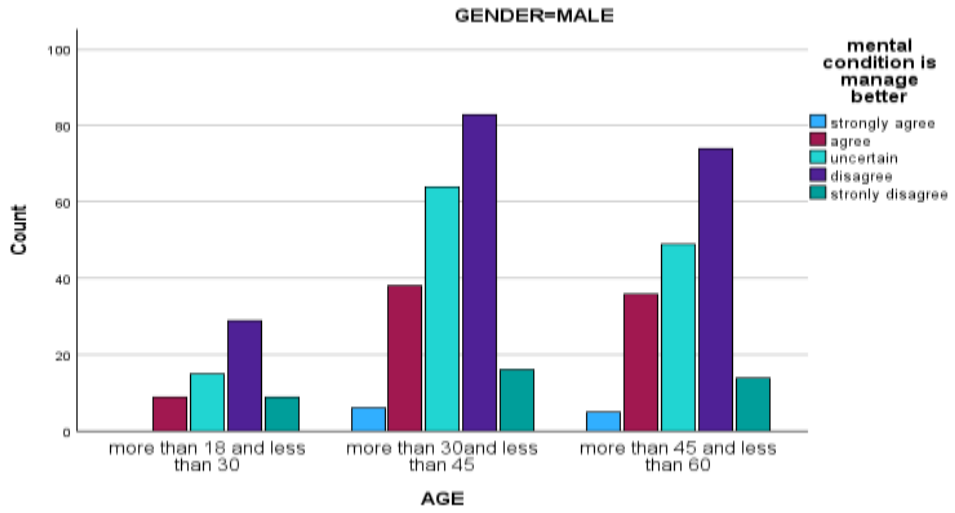
Chi-Square test, the p-value was found to be <0.001, which is less than 0.05. **This means that *the* psychological stress arising due to work pressure shows** statistically significant differences across different age groups and genders**.**

C: **After the pandemic, I have been able to manage my mental health in a better way.**

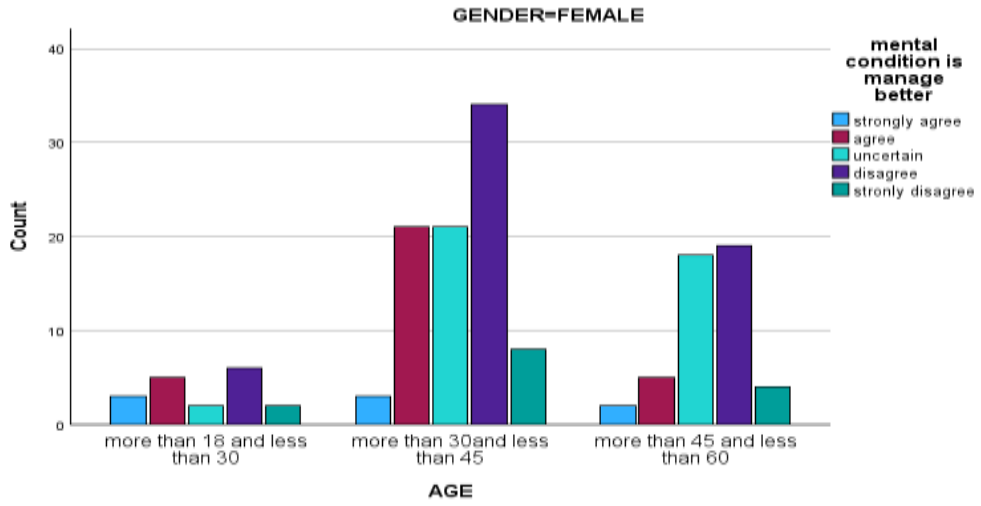
Table 2.5

Crosstab								
				mental condition is manage better					
GENDER				strongly agree	agree	Un certain	Dis agree	strongly disagree	Total
MALE	AGE	more than 18 and less than 30	Count	0	9	15	29	9	62
			% of Total	0.0%	2.0%	3.4%	6.5%	2.0%	13.9%
		more than 30and less than 45	Count	6	38	64	83	16	207
			% of Total	1.3%	8.5%	14.3%	18.6%	3.6%	46.3%
		more than 45 and less than 60	Count	5	36	49	74	14	178
			% of Total	1.1%	8.1%	11.0%	16.6%	3.1%	39.8%
	Total		Count	11	83	128	186	39	447
			% of Total	2.5%	18.6%	28.6%	41.6%	8.7%	100.0%
FEMALE	AGE	more than 18 and less than 30	Count	3	5	2	6	2	18
			% of Total	2.0%	3.3%	1.3%	3.9%	1.3%	11.8%
		more than 30and less than 45	Count	3	21	21	34	8	87
			% of Total	2.0%	13.7%	13.7%	22.2%	5.2%	56.9%
		more than 45 and less than 60	Count	2	5	18	19	4	48
			% of Total	1.3%	3.3%	11.8%	12.4%	2.6%	31.4%
	Total		Count	8	31	41	59	14	153
			% of Total	5.2%	20.3%	26.8%	38.6%	9.2%	100.0%
TOTAl	AGE	more than 18 and less than 30	Count	3	14	17	35	11	80
			% of Total	0.5%	2.3%	2.8%	5.8%	1.8%	13.3%
		more than 30and less than 45	Count	9	59	85	117	24	294
			% of Total	1.5%	9.8%	14.2%	19.5%	4.0%	49.0%
		more than 45 and less than 60	Count	7	41	67	93	18	226
			% of Total	1.2%	6.8%	11.2%	15.5%	3.0%	37.7%
	Total		Count	19	114	169	245	53	600
			% of Total	3.2%	19.0%	28.2%	40.8%	8.8%	100.0%

Graph: 2.5



Graph: 2.5



To assess the ability to regulate their emotional state, workers were asked the third question: **"After COVID-19, I am able to manage my emotional condition in a better way."**
From the responses, it was found that **there was no major difference across different age groups and genders** in their perceived ability to regulate their emotional state.

1.5 Among respondents:

- In the 18–30 years group, 46.8% males and 33.3% females *disagreed* with this statement.
- In the 30–45 years group, 40.1% males and 39.1% females also *disagreed*.
- In the 45–60 years age group, 41.6% males and 39.6% females *disagreed* as well

Overall, 40.8% of all respondents accepted that they are unable to regulate their emotional state effectively after COVID-19.

Table 2.6

Chi-Square Tests				
GENDER		Value	df	Asymptotic Significance(2-sided)
MALE	Pearson Chi-Square	6.751b	8	.564
	Likelihood Ratio	7.917	8	.442
	Linear-by-Linear Association	2.788	1	.095
	N of Valid Cases	447		
FEMALE	Pearson Chi-Square	12.770c	8	.120
	Likelihood Ratio	11.850	8	.158
	Linear-by-Linear Association	1.878	1	.171

	N of Valid Cases	153		
TOT	Pearson Chi-Square	4.832a	8	.775
	Likelihood Ratio	4.639	8	.795
	Linear-by-Linear Association	.497	1	.481
	N of Valid Cases	600		

In the Chi-Square test, a p-value of 0.775 was obtained, which is greater than 0.05. This means that there is no statistically significant difference across different age groups and gender with respect to their ability to manage their mental health after the pandemic.In other words, after COVID-19, no significant association was found between age, gender, and the ability to manage mental health

5 CONCLUSION

There was no significant change in the working conditions of industrial workers. Based on the analyses, it became clear that although some changes were observed in the working conditions after COVID-19, these changes were not different by gender. Since the p-value obtained from the chi-square test was greater than 0.05, the null hypothesis could not be rejected, meaning that COVID-19 did not bring any statistically significant change in the working conditions. However, considering the workers' responses, it can be said that some workers did feel improvements, particularly with respect to safety measures.

The pandemic had a significant impact on mental health and work-related stress, where notable statistical differences were observed across age groups and gender. Overall, 41.3% of respondents accepted that the pandemic affected their mental health, with the highest disagreement seen among females aged 18–30 (55.6%) and males aged 30–45 (46.9%), indicating that they felt no such impact. The chi-square p-value of 0.009 (< 0.05) led to the rejection of the null hypothesis ("no effect on mental health"), showing that the impact varied significantly according to age and gender.

Similarly, more than 74% of respondents accepted that work pressure after COVID-19 caused them mental stress, especially among females aged 30–45 (43.7%) and 45–60 (43.8%), and males aged 45–60 (39.9%). Here, the p-value was < 0.001, leading to the rejection of the null hypothesis and indicating significant differences in stress levels across age groups and gender.

However, regarding the ability to manage their mental health, 40.8% reported difficulty in coping, but since the p-value (0.775) was greater than 0.05, the null hypothesis ("no difference in coping ability") could not be rejected. This indicates no statistically significant variation in coping ability on the basis of age or gender.

Overall, it can be concluded that the pandemic had a strong impact on mental health and work-related stress, but the ability to manage mental health challenges remained similar across all demographic groups.

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