

# Silent struggles, challenges faced by women at workplaces in remote rural areas

## Abstract

**Background:** Women face lots of challenges at workplaces that affect health and wellbeing.

**Objective:** Community-based study was conducted amongst rural women to learn about workplace harmful practices in remote villages.

**Methods:** Cross-sectional analytic study included 4500 randomly selected tribal women, between  $\geq 20$  to  $\leq 49$  years, residing in 140 villages, willing to be study subjects. In-depth face-to-face interviews were conducted by research assistant in villages at mutually convenient places to know about awareness of women regarding harmful practices at workplaces.

**Results:** Of 4500 women interviewed, majority (47.2%) were of 20-29 years age, educated upto primary level (38.8%), belonged to lower-middle economic class (42.2%). Of 4500 women, 1573(35.0%) were home-makers, 2927(65.0%) working women. Of 35.0% home-makers, 84.0% said they were aware that pesticides had ill-effects, but of working women, 74.7% talked of awareness. Total 71.4% of working women reported pesticides/other harmful chemicals use at workplaces, 52.8% regularly, 47.2% occasionally, and 28.8% said that pesticides were used even when pregnant women were working. Of 2927 working women only 59.6% were aware of need for protection from pesticides / chemicals, 84.2% reported availability of some protective equipments at workplaces. Of working women, majority agricultural laborers, 83.3% reported non-availability of toilets at workplaces with challenges in body function.

**Conclusion:** More of less educated, belonging to low economic class, working as labourers faced challenges at workplaces, less of them had awareness. There is need for stringent regulations to provide basic amenities at workplaces, cautious use of harmful agents, with special care when pregnant women are working.

**Keywords:** women, laborer, workplaces, pregnant, harmful practices, challenges

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## Introduction

### Background

It is important to consider workplace environment when looking at women's overall health. There are various issues at workplaces which affect women's health and wellbeing. It is crucial to keep in mind that men and women have different susceptibilities to workplace-related hazards.<sup>1</sup> Furthermore, women are prone to different workplace-related health challenges than men because of obvious differences in body and its functions, different reaction to exposures and susceptibility. In addition, several other factors like social, economic, and cultural also make women prone to risk of injuries and illness at the workplaces.<sup>1</sup> Also, issues related to reproduction and pregnancy are other major factors that put women more at risk at workplaces. According to recent figures from the Centers for Disease Control and Prevention, at workplaces, 75% of women are of reproductive age.<sup>1</sup> It has been observed that exposure of pregnant women at workplaces can affect the baby too. Even low levels of exposure to chemicals or pesticides and other substances that are not harmful to the mother, may be harmful to the baby and can cause serious damage.<sup>1</sup>

### Objectives

The community-based study was conducted amongst rural women to learn about workplace harmful practices.

## Material and methods

**Study design** - Prospective cross-sectional analytic study.

**Study setting and duration** - The study was conducted over one year in a total of 140 randomly selected tribal villages around the village with health facility in rural, remote forestry, and hilly region in Central part of India in Maharashtra.

### Study population

**Inclusion criteria** - The study included randomly selected women of  $\geq 20$  to  $\leq 49$  years of age residing in the selected villages and willing to provide desired information.

**Exclusion criteria:** Those not willing or not with mental status to answer the questions were excluded.

**Sample size:** The calculated sample size was 4500 with a 95% confidence and considering a 10% risk of dropouts using a free online statistical calculator (statulator).<sup>2</sup>

**Sampling technique:** A minimum of 25 participants were selected randomly from each village, as some villages were small and others large, using a random number table to attain the desired sample size.

### Data collection

The present study was conducted after approval of the Institutional ethics committee (IEC) of Mahatma Gandhi Institute of Medical

Sciences, Sevagram. Informed consent from the participants was taken. In-depth face-to-face interviews of all the participants were conducted asking about socio-demographic features, including age, education, occupation, and economic status and using a predesigned tool with open and close-ended questions, recorded on a structured tool by trained research assistant. The interviews were conducted in villages at places convenient to participants and the research assistant. Each interview was conducted for 15-30 minutes, maintaining the confidentiality and privacy of the participants. Their knowledge and perceptions regarding exposure to harmful chemicals, sanitation, toilet facilities at the workplaces, use of pesticides during working hours, and knowledge about need for protection from these chemicals and availability of protective equipments at workplaces were recorded by research assistant. None of the participants was given the tool to fill.

### Statistical analysis

The data was statistically analyzed using Statistical Package for the Social Sciences (SPSS) software version 21.0. The numerical data was presented as numbers and percentages and categorical variables as frequencies or rates wherever needed. Comparison of categorical variables was done using the chi-square test and a p-value <0.05 was considered statistically significant.

### Results

Of the total 4500 women interviewed, the majority (47.2%) were of 20-29 years of age, educated up to primary level (38.8%), agricultural laborers (73.9%), and belonged to low middle economic status

(42.2%). Of these 4500 women, 1573(35.0%) were home makers and 2927(65.0%) were working women. Of the 1573 non-working women, 1322(84.0%) were aware of possibilities of some ill-effects of pesticides or other chemicals used at workplaces on health, more of 40-49 years of age (88.0%), or having higher levels of education (87.9%), or upper middle economic class (90.0%). Table 1 depicts the correlation of socio-demographic features of home-makers with their awareness about the possibilities of some ill-effects of pesticides or other harmful chemicals on health Table 1.

Of 2927 working women, 2186(74.7%) were aware of ill-effects of pesticides on health, the majority of 30-39 years of age (83.8%), agricultural laborers. However, quite a lot of working women with low levels of education and low economic classes (81.3%) were also aware of possibilities of ill-effects of pesticides. Table 2 depicts the correlation of socio-demographic features of working women with their awareness about the possibilities of ill-effects of pesticides or other harmful chemicals on health Table 2. Of the 2927 working women, 2438 (83.3%) reported non-availability of toilets at their workplaces. The majority of these working women were forced to go to open fields for urination or defecation (59.9%), some travelled back to their homes (28.0%), and 12.1% used other people's houses near their workplaces. Of these 2438 women, 87.9% were agricultural laborers who had no toilet facilities around their work area, followed by casual workers (73.3%) working in small-scale industries, welding workshops, or brick kilns and shop keepers (57.7%). Table 3 depicts the correlation of socio-demographic features and profession with the availability of toilet facilities at workplaces Table 3.

**Table 1** Correlation of socio-demographic features of home-makers with awareness about the ill-effects of pesticides and other harmful chemicals on health

Variables	Total study participants	Home-makers		Awareness about ill-effects of Pesticides/Harmful chemicals	
		Number	%	Numbers	%
<b>Age (Years)</b>					
≥20-≤29	2123	736	34.7	589	80
≥30-≤39	1565	346	22.1	301	87
≥40-≤49	812	491	60.5	432	88
<b>Total</b>	<b>4500</b>	<b>1573</b>	<b>35</b>	<b>1322</b>	<b>84</b>
<b>Education</b>					
Illiterate	1495	356	23.8	297	83.4
Primary	1748	629	36	534	84.9
Secondary / Higher Secondary	997	430	43.1	360	83.7
Graduate	190	125	65.8	102	81.6
Post Graduate/ Professional	70	33	47.1	29	87.9
<b>Total</b>	<b>4500</b>	<b>1573</b>	<b>35</b>	<b>1322</b>	<b>84</b>
<b>Economic Status</b>					
Upper Class	112	47	42	25	53.2
Upper Middle Class	325	200	61.5	180	90
Middle Class	929	275	29.6	195	70.9
Lower Middle Class	1897	842	44.4	756	89.8
Lower Class	1237	209	16.9	166	79.4
<b>Total</b>	<b>4500</b>	<b>1573</b>	<b>35</b>	<b>1322</b>	<b>84</b>
<b>Parity</b>					
P 0	690	128	18.6	81	63.3
P 1 – P 2	2341	995	42.5	897	90.2
>P 3	1469	450	30.6	344	76.4
<b>Total</b>	<b>4500</b>	<b>1573</b>	<b>35</b>	<b>1322</b>	<b>84</b>

**Table 2** Correlation of socio-demographic features of working women with their awareness about the ill-effects of pesticides and other harmful chemicals on health

Variables	Total study participants	Working		Awareness about ill-effects of pesticides/harmful chemicals	
		Number	%	Numbers	%
<b>Age (Years)</b>					
≥20-≤29	2123	1387	65.3	941	67.8
≥30-≤39	1565	1219	77.9	1022	83.8
≥40-≤49	812	321	39.5	223	69.5
<b>Total</b>	<b>4500</b>	<b>2927</b>	<b>65</b>	<b>2186</b>	<b>74.7</b>
<b>Education</b>					
Illiterate	1495	1139	76.2	810	71.1
Primary	1748	1119	64	865	77.3
Secondary / Higher Secondary	997	567	56.9	452	79.7
Graduate	190	65	34.2	38	58.5
Post Graduate/ Professional	70	37	52.9	21	56.8
<b>Total</b>	<b>4500</b>	<b>2927</b>	<b>65</b>	<b>2186</b>	<b>74.7</b>
<b>Profession</b>					
Agriculture Laborer	3326	2096	63	1696	80.9
Casual Laborer*	1014	753	74.3	445	59.1
Shop Keeper	160	78	48.8	45	57.7
<b>Total</b>	<b>4500</b>	<b>2927</b>	<b>65</b>	<b>2186</b>	<b>74.7</b>
<b>Economic Status</b>					
Upper Class	112	65	58	42	64.6
Upper Middle Class	325	125	38.5	95	76
Middle Class	929	654	70.4	401	61.3
Lower Middle Class	1897	1055	55.6	812	77
Lower Class	1237	1028	83.1	836	81.3
<b>Total</b>	<b>4500</b>	<b>2927</b>	<b>65</b>	<b>2186</b>	<b>74.7</b>
<b>Parity</b>					
P 0	690	562	81.4	381	67.8
P 1 – P 2	2341	1346	57.5	921	68.4
>P 3	1469	1019	69.4	884	86.8
<b>Total</b>	<b>4500</b>	<b>2927</b>	<b>65</b>	<b>2186</b>	<b>74.7</b>

\*Small Scale, (Food, Shoes making, Bamboo items) Industry, Welding Workshop, Brick furnace.

Of the 2927 working women, 2089 (71.4%) reported pesticides or chemicals use in their workplaces during working hours. Of these 2089 women, 1102 (52.8%) reported regular exposure during work hours, and 987 (47.2%) women reported occasional exposure during work hours. Furthermore, of these 2089 women who reported pesticides use at the workplaces, 602 (28.8%) reported that pesticides were used even with pregnant women around, of which 599 (99.5%) worked as agricultural laborers. When compared with their occupation, it was observed that the majority of women exposed to pesticides or chemicals at their workplaces worked as agricultural and casual laborers working in small-scale industries, welding workshops, or brick furnaces. The correlation of socio-demographic features and profession with exposure to pesticides or other harmful chemicals is depicted in (Table 4).

Furthermore, on interviewing 2927 working women about their awareness regarding protection from pesticides and other harmful chemicals, only 1744 (59.6%) were aware of the need, and of these only 1468 (84.2%) reported the availability and supply of protecting

equipments like face covers, masks, gloves, shields, goggles, etc. while working with harmful chemicals. Of these 1468 women, majority (88.8%) were agricultural workers, followed by shopkeepers (73.7%), and casual laborers (72.1%) working in small-scale industries, welding workshops, and brick kilns.

Table 5 depicts the correlation of socio-demographic features and profession with the knowledge regarding protection from pesticides and the availability of protective equipment provided at workplaces (Table 5). Overall, it was observed that of 4500 women interviewed, of 2927 (65.0%) were working women, some were aware of harmful effects of pesticides and other chemicals on health, more of younger age, even with minimum levels of education and irrespective of their economic class, whereas non-working women who were aware were of later age 40-49 years, had higher education and economic class. But awareness of need for protection and modes of protection were low. Of 2927 working women 83.3% reported the non-availability of adequate toilet facilities at their workplaces, with the majority working as agricultural laborers (87.9%). Furthermore, 71.4% of working

women reported use of pesticides and other harmful chemicals at the workplaces, 28.8% reported use of harmful chemicals at their workplaces when pregnant women around. Agricultural and casual laborers were at the maximum risk of exposure to these chemicals. Of the working women, only 59.6% were aware of need for protection from these chemicals and of them also 84.2% reported awareness about the availability and supply of protective equipment (face masks, goggles, gloves, etc.) at their workplaces for self-protection.

## Discussion

In today's era, pesticides or other harmful chemicals are widely used in agriculture and other places. Exposure to these substances can cause health issues. A study on pesticide exposure among female horticulture workers in Tanzania revealed that women farmers and other women workers were frequently exposed to pesticides either directly or indirectly while working on the farms and hence, were at a greater risk of accumulated exposure due to their long working hours and multiple exposures at work. This exposure to pesticides during work made women workers prone to suffer from adverse health issues.<sup>3</sup> The literature related to the impact of harmful chemicals like pesticides on women workers is very scarce. A recent study from Sub-Saharan Africa revealed that occupational and non-occupational exposure from pesticides appeared to be grossly underestimated for women because of the perception that women's work was not hazardous for their health and they were not at risk of exposure. It was also reported that due to the higher levels of adipose tissue in a women's body and the hormonal changes they faced in their lives, especially during pregnancy, lactation, or menopause, made them more likely to absorb certain pesticides in their bodies from contaminated environments compared to men, leading to many harmful consequences on their health.<sup>4</sup>

Moreover, it is not only pesticides or chemicals exposure at workplaces that affected women's health, there are other issues also that can have long-lasting impacts on women's overall health including lack of sanitation at workplaces. According to the WHO and UNICEF 2021 figures, an estimated 3.6 billion people lack access to safely managed sanitation services all over the world and the majority of these people belong to Sub-Saharan Africa, Oceania, and East and South Asia.<sup>5</sup> A study conducted in Chennai, India revealed that inadequate or no toilet facilities at workplaces lead to genitourinary problems in women workers. This in turn forced women to eat and drink less, to avoid defecation or urination for several hours, further adding to the risk of malnutrition.<sup>6</sup> In addition to this, the need for adequate sanitation becomes very important for menstruating women, and the lack of access makes them prone to various urogenital infections.<sup>7</sup> It was reported that menstrual hygiene among menstruating girls and female teachers working in schools of low- and middle-income countries remained limited, hindering their contribution to the workplaces and putting them at risk of genital infections.<sup>8</sup> Furthermore, lack of toilets at the workplaces, forced women to opt for open defecation or urination, hence exposing them more to the fear of physical and sexual harassment and violence.<sup>9</sup> Women face a lot of challenges including non-availability of adequate sanitation facilities at workplaces leading to health issues, exposure to harmful chemicals, security issues, pregnancy related discrimination, etc.

The present community-based study was conducted with 4500 rural women of  $\geq 20$  to  $\leq 49$  years of age to know about their knowledge and perceptions regarding workplace-related harmful practices in a remote region. It was observed that of total 65.0% working women, 83.3% complained of lack of adequate toilet facilities at their workplaces. In

addition to this 71.4% of working women reported use of pesticides and other harmful chemicals at the workplaces with 52.8% regularly, and 47.2% occasionally during working hours. Moreover, 28.8% women reported the use of pesticides and harmful chemicals at the workplaces while pregnant women were around. Agricultural and casual laborers were at the maximum risk of exposure to pesticides and other chemicals used at workplaces. In the present study it was revealed that 1744 out of 2927 working women were aware of the need for protection from these chemicals and 84.2% reported the availability and supply of some modalities of protective equipment at the workplaces for self-protection.

A recent study conducted in the United Kingdom to assess the challenges faced by mobile workers (care workers, police, delivery drivers, gardeners, cleaners, utility workers) related to hygiene facilities reported that lack of hygiene forced these workers to resort to approaches that may adversely affect their health like restricting fluid or food intake, and ignoring urges or compromising their dignities by relieving themselves in open or even soiling their clothes.<sup>10</sup> Another study conducted in Zambia on the provision of sanitary facilities in workplaces revealed that the provision of sanitary facilities was very poor, predisposing workers and the trading population to multiple public health hazards.<sup>11</sup> A similar study conducted in India to access sanitation facilities at the workplaces amongst poor urban women reported that construction and domestic workers were the worst affected ones compared to factory workers and street vendors. Because of the lack of toilet facilities at the workplaces, women were forced to urinate and defecate in the open and to bear the fear and shame associated with it. They also had to walk for long distances during working hours to use a toilet and suffered from the inability to maintain adequate menstrual hygiene at work, and loss of pay due to missing work during menstruation.<sup>12</sup> The United Nations also reported that women usually have physical needs different from men and have a greater need for privacy especially when using toilets. Inaccessibility to toilets makes them highly vulnerable to rape, sexual harassment, and other gender-based violence.<sup>13</sup>

Similar to the present study, other studies have also shown the increased risk of exposure to pesticides and harmful chemicals especially among women working in farms, tea gardens, or chemical factories. A study conducted to evaluate the effects of pesticide or chemical exposure on pregnancy outcomes in women working in tea gardens revealed that occupational pesticide exposure during pregnancy resulted in decreased acetylcholinesterase activity and caused in-utero pathological changes and increased the expression of hypoxia-inducible factor (HIF)-1 $\alpha$  leading to placental insufficiency and fetal growth restriction.<sup>14</sup> Another recent study conducted in Southwestern Idaho revealed that women working in agriculture have a greater risk of pesticide exposure. They reported that female farm workers handling pesticides during the spray season were at an increased risk of exposure to organophosphate and pyrethroid insecticides, as well as the herbicide 2,4-D leading to multiple health issues.<sup>15</sup> Other similar studies have also shown that farmworkers were at increased risk of pesticide exposure and its associated toxicity and ill effects on health with women being twice more likely to be affected compared to men.<sup>16,17</sup>

Furthermore, studies have shown that exposure to pesticides can result in a wide range of health problems in women and their newborns.<sup>18</sup> A study conducted on rural women of Brazil revealed that occupational exposure to pesticides resulted in an increased risk of cancers, central nervous system damage, malformations, and endocrine changes.<sup>19</sup> Hence, there is a need for stringent enforcement of regulations and guidelines at workplaces for workers, to provide



them with basic amenities including adequate sanitation, privacy, security, and protection from harmful chemicals and pesticides while working, training of working staff when dealing with these chemicals, and precautionary behavioral measures to make workplaces, a healthy and productive environment for female workers. Special care must be taken for pregnant women, to protect them and their babies from the ill effects of these harmful chemicals and practices at the workplaces.

## Conclusion

From the present study, it appears that women face a lot of challenges in the workplaces including sanitation facilities, risk of exposure to chemicals, more for less educated, low socio-economic class, and working as laborers in agriculture or other places. Female workers especially those working as agricultural and casual laborers are at increased risk of exposure to pesticides which can have long-lasting impacts on their health. Pregnant women are also at increased risk of exposure to these harmful chemicals, putting their babies at increased risk of damage. It is the need of hour to make stringent regulations and guidelines to provide basic amenities including adequate sanitation facilities, safety, security, and protection from harmful chemicals to all workers, with special care for pregnant women.

## Declarations

- **Ethics approval:** The present study was conducted after approval of Institutional Ethical Committee of Mahatma Gandhi Institute of Medical Sciences, Sewagram.
- **Consent of participants:** The study was conducted after informed consent from the participants.

## Acknowledgments

None.

## Conflicts of interest

Authors have no conflicts of interest to declare.

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