

ASSESSMENT OF HEALTH HAZARDS TO THE WORKERS OF PHARMACEUTICAL INDUSTRIES OF PESHAWAR, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

Objective: The purpose of our research is to assess the health hazards in the workers of different pharmaceutical Industries.

Materials and Methods: We conducted a cross-sectional study from January 2022 to July 2022 in 4 different pharmaceutical companies in Peshawar, Khyber Pakhtunkhwa, Pakistan. A sample size of 386 individuals working in 4 different pharmaceutical industries was selected using a nonprobability convenient sampling technique. Collected data were analyzed using SPSS version 23 for Windows.

Results: A total of 85 workers completed the questionnaire of which 64 (75.3%) were male and 21(24.7%) were female workers, whose ages varied from 25-50 years with the mean being 29.45 i.e. almost 30 years of age. Among them 20 had a primary education level, 19 had middle, 27 had SCC, 12 had HSSC and only 7 had a graduate level of education. The socioeconomic status of 66 participants was satisfactory and of 19 participants was unsatisfactory. The workers were symptoms free before starting the job. In the eye, the most occurred symptom was irritation or itchiness of the eyes (27.1%), in GI, burning sensation in the stomach (50.6%), in the respiratory system, shortness of breath (21.2%) and in the skin, rash on the skin (45.9%).

Conclusion: Our study suggested that workers in the pharmaceutical industry are prone to various health hazards. Effective legislation and public health measures are needed to ensure the healthy environment and health of the workers.

Key Words: Health Hazards, Chronic Cough, Shortness of Breath, Dryness of eyes.

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INTRODUCTION

Human beings are being exposed to new diseases day by day. New viruses, bacteria, and other microorganisms as well as chemicals are the source of such diseases which has made this compulsory to have proper medications for them. For these purposes, human beings are working hard to prepare effective medicines in the pharmaceutical industry.

These industries have attained prime importance due to the efforts of helping humans to face diseases and

to cure them. It is accepted that these industries are doing a lot for human health but meanwhile, the workers working in these industries are at high risk of health hazards. These industries are a source of a lot of health problems like other chemical industries because pharmaceutical industries use a lot of different chemicals. ¹

Preparation of APIs (active pharmaceutical ingredients) and formulation process involving the use of many chemicals which are very dangerous such as acids, bases, oxidizing and reducing agents which are found sometimes at very high concentrations and cause damage to the health of workers during the preparation of APIs and medicines.

When these workers get exposed to these dangerous chemicals which are used in these industries, these substances enter the body through various routes such as ingestion, inhalation, and also through the skin which causes damage to many organ systems. These chemicals

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have many hazardous properties like carcinogenic, mutagenic, and teratogenic properties.

It is also a hazard that workers involved in the preparation of antibiotics are exposed to drug materials and prolonged exposure to these antimicrobials leads to the development of bacterial resistance.²

The safety of workers in pharmaceutical industries is not given enough importance because on the surface industry seems to be very clean. A sterile environment and lab coats worn by workers are just an illusion of safety but during drug production, they are continuously being exposed to harmful chemicals.^{3,4}

Although, a lot of research is done on the hazards to workers in pharmaceutical industries still it is not enough because development in these industries to make new medicines bring out new hazards of which workers are not aware.^{5,6} It is studied that in pharmaceutical industries, during the package of pharmaceuticals workers face a long time in static work and it is a cause of musculoskeletal disorders.⁷

It is also studied that workers in pharmaceutical industries and hospital laboratories have a relation with a high risk of spontaneous abortions.⁸ In Peshawar, there is no research in the field of pharmaceutical industries for the assessment of health hazards to the workers there. So, our research will play a key role in this regard and will prove beneficial.

MATERIAL AND METHODS

We conducted a cross-sectional study and data was collected from different pharmaceutical industries manufacturing drugs related to human diseases in Hayatabad, Peshawar. The total study duration was approximately 6 months. We used a convenient sampling technique for our studies.

Only those male and female workers have included who were having no symptoms before employment and had a job duration of more than six months. Workers having preexisting diseases or chronic diseases were excluded from the study. The formula for sample size was $N = Z^2 \times PQ/d^2$ and with the prevalence of 50% sample size is calculated as 384.

Data were analyzed using SPSS version 20 for Windows. Data was qualitative so it was calculated as frequency and percentage. All results were presented in the form of tables and graphs.

RESULTS

A total of 85 workers completed the questionnaire of which 64 (75.3%) were male and 21 (24.7%) were female workers, whose ages varied from 25-50 years with the mean being 29.45, i.e., almost 30 years of age. Among them 20 had a primary education level, 19 had middle, 27 had SSC, 12 had HSSC and only 7 had a graduate level of education.

The socioeconomic status of 66 participants was satisfactory and of 19 participants was unsatisfactory. In the eyes, the most occurred symptom was irritation or itchiness of the eyes (27.1%), in GI, burning sensation in the stomach (50.6%), in the respiratory system, shortness of breath (21.2%) and in the skin, rash on the skin (45.9%).

Table 1: Education of participants

Education Level	Frequency	Percent
Primary	20	23.5
Middle	19	22.4
SSC	27	31.8
HSSC	12	14.1
Graduate	7	8.2
Total	85	100

Table 2: Most Common Symptoms of different symptoms

System	Most Common System
GIT System	Chronic burning sensation of stomach
Respiratory System	Shortness of breath
Skin	Rash on Skin
Eye	Irritation of eyes

DISCUSSIONS

According to the results of our studies, it was found that most of the participants responded positively to the question asked about irritation or itchiness of the eyes (27.1%), followed by dryness of eyes (22.4%), any discomfort in eyes (10.6%), excessive watering of eyes (8.2%) and experienced any eye disease during the job (8.2%) respectively.

A study was conducted in Indiana in which it was concluded that irritation of the eyes was the most frequent symptom along with dryness of the eye.⁹ According to another study conducted on tannery workers in the leather industry in Kanpur India, dry eyes are one of the significantly prevalent occupational hazards among them, the severity of which increases with age.¹⁰

It was also found that most of the participants re-

sponded positively to questions asked about a chronic burning sensation in the stomach (50.6%), followed by pain in the stomach before a meal (30.6%), frequent constipation or diarrhea (22.4%), any previous GIT disease that kept them hospitalized for 1 week (2.4%), painful bowel movements (1.2%) and hemorrhoids (1.2%) respectively.

According to a study on GIT symptoms in shift workers in Chicago published by the Scandinavian Journal of Work, environment, and Health, there is an increased risk of developing GI symptoms and peptic ulcer disease in shift workers.¹¹ A study conducted on occupational health problems of highway restaurant workers in Pune, India suggests that gastrointestinal symptoms such as heartburn, abdomen pain, etc, were reported by 12 (9.4%) subjects.¹²

It was also found that the majority of participants responded positively to questions asked about the rash on the skin (45.9%), followed by itching of the skin (29.4%), dryness of the skin (20%), burning sensation on the skin (14.1%), any experience of skin bleed during work (10.6%) and skin cracks during work (5.9%) respectively. A study was conducted in a rural village in Laos that concluded that 53% of study participants have a skin disease.¹³ A study was conducted in India on university students of pharmacy and non-pharmacy disciplines. Results show that out of 17 students, 8 students from the pharmacy department and 9 students from the non-pharmacy departments suffered from skin rash conditions nearly every day. Similarly, out of 33 total respondents, 16 students from the pharmacy department and 17 from the non-pharmacy department stated that they suffer from skin rash conditions several times a month.¹⁴

It was also found that the majority of participants responded positively to the question asked about the shortness of breath while walking fast or up a slight hill (21.2%), followed by chronic cough (11.8%), chest tightness during work (9.8%), sinusitis (9.8%), nasal catarrh (2.4%) and chronic phlegm (1.2%) respectively. A study was conducted among workers of the tannery industry in Mojo Town Southeast Ethiopia according to which the prevalence of respiratory symptoms among exposed workers was 27.1% and among non-exposed workers was 8.3% respectively.¹⁵ According to a study conducted on respiratory findings in the pharmaceutical industry, there is a significantly higher prevalence of chronic respiratory symptoms among workers in the pharmaceutical industry, the highest being for sinusitis, nasal catarrh, and dyspnea.¹⁶

CONCLUSION

Our study suggested that workers in the pharmaceutical industry may develop symptoms related to the eye, GIT, skin, and respiratory system. Effective legislation and public health measures are needed to ensure the healthy environment and health of the workers.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

- Mazhar F:** Concept, planning, study design, study conduction, critical review, analysis, manuscript writing.
- Sultan Q:** Critical review, discussion, interpretation, manuscript writing, study conduction.
- Ullah M:** Analysis, critical review, study conduction.
- Siddiqui F:** Critical Review, study conduction, interpretation.
- Iqbal M:** Study design, study conduction.
- Shah SS:** Study design, study conduction.
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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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