

# Physical Hazards among Shampoo Factory Workers at Ranya city, Iraqi Kurdistan Region

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## ABSTRACT

A large number of workers especially youths are employed in industries. Poor and unsafe working environment, rapid introduction of new industries, inventions pose serious danger to workers. Recognition of health hazards is the first step in hazard control. This study is an attempt to identify the level of exposed workers to physical hazards at workplace. A cross-sectional epidemiological study conducted among shampoo factory workers at Ranya city. 53 workers participated in this study. Data were collected by using a constructed questionnaire, using structured interview techniques. The workers selected purposively according to study criteria. The study observed light, electric and vibration hazards were relatively uncommon, over half of the respondents at participating workers assessed noise and temperature hazards as moderate or high. More research is required to find ways to reduce occupational hazards to minimum level and thereby reduce exposure of physical hazards. It is necessary to provide awareness sessions and educational health programs regarding occupational health and safety issues to protect the health of the workers.

**Keywords :** Occupational hazards, Physical hazards, Shampoo factory, Factory worker

## Introduction

Working in the industry comes with a variety of dangers and hazards. There are 2.9 billion workers who are exposed to hazardous risks at their work places. The hazard defined as the presence of a material or situation that has the potential to cause loss or injury (Amabye, 2016). Occupational accidents and work-related diseases remain a relatively uncovered domain in global literature. As a result of occupational accidents or work-related diseases globally attribute to more than 2.78 million deaths and 374 million non-fatal injuries (International Labour Organization, 2021). Workers are exposed to a variety of physical, chemical, and biological stimuli, making them susceptible to a variety of health is-

suess. Injuries, respiratory issues, rashes, musculoskeletal disorders, and gastro-intestinal problems are some of the conditions that can occur (Pratik K. Jasani *et al.*, 2016). Many health-related problems could arise from physical hazards such as falls, which are a common cause of workplace injuries and deaths. Machines have moving parts, sharp edges, hot surfaces, and other hazards that, if used improperly, can crush, burn, cut, shear, stab, or otherwise hit or wound staff (NIOSH, 2020).

A large number of workers especially youths are employed in industries. Recognition of health hazards is the first step in hazard control. Inspection of workplace is the best source of direct information about potential health hazards (Arnold *et al.*, 2019).

Safe work and workplace, for increased produc-

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tion and higher productivity, are necessary and hence promotion and protection of safe work and workplace are the complementary aspects of industrial development (Beyene *et al.*, 2019).

The industries sector is one of the main factors that helps to develop economies in the Kurdistan Region Government (KRG). A healthy population is the foundation of a country's success, the health of workers is essential to economic and social success as well as to the well-being of the population. At (KRG) there are limited studies can be found on morbidity pattern related to workplace hazards among industry workers. The aims of this study are to identify how much workers are exposed to physical hazards at work.

## Materials and Methods

### Design and Sample

A cross-sectional epidemiological study was conducted among shampoo factory at Ranya city. The shampoo factory has over 130-line workers. Managers, executives, custodial staff, administrative staff were excluded.

Among 130 workers, 53 workers selected from Shampoo factory including both sex male/female at all ages, day and night shifts, and those who have been working at the factory for any amount. The managers or executives made an announcement about the study to all workers and then the workers selected purposively according to study objective and criteria.

### Data Collection and The Study Instrument

The data were collected by using a constructed questionnaire from June 14th. 2020 to December 16th. 2020. Using structured interview techniques. The questionnaire was constructed and developed from literature review and previous studies (Faith, 2014) and it consisted of two sections. Section one gives socio-demographic data of the respondents, section two related to physical hazards at workplace through 23 items. Which related to (noise, heat, electric, light and vibration). The questionnaire was translated to participant's mother's language. Informed consent from the workers was taken before including them in the study.

Items related to physical hazards were measured by respondent self-report using five levels of Likert scales and rating as the: Strongly Agree (SA), Agree

(A), Neither agree nor disagree (ND), disagree (D) and Strongly Disagree (SD). Rating such as 5, 4, 3, 2 and 1. If the workers exposed or at risk of highly exposed to physical hazards at workplace then given score 5, 4 for hazard, 3 for Neither agree nor disagree (moderate hazard), 2 for a little hazard and 1 for none hazard which mean workers are not exposed or at risk of expose to physical hazards (Faith, 2014) (James, 2017). The mean of the score from 5 - 3.67 was considered high hazard, 3.66 - 2.34 was considered moderate hazard, and less than 2.34 was considered low hazard. The data was analyzed using (SPSS) version 20.

### Validation and Reliability

The questionnaire validated by 20 experts regarding the content and the relevance of the items and to achieve the objective of the study. The experts included public and environmental health medicine specialist, community and family medicine specialist, community health nursing specialist, biochemistry specialist, biostatistics and data analyst specialist. Based on the experts' comments, minor modifications to the wording of the content were required. A pilot study was conducted from May 7th to June 7th 2020 to estimate the proportion of workers that suffering from morbidity patterns in addition to find out internal consistent for physical hazards items. The sample consisted of 10% of study sample worker who selected purposively samples were included from the original sample size. Reliability was measured using the Cronbach's alpha method for 23 physical hazards items. The alpha value was 0.69 which indicate the questionnaire was internally consistent.

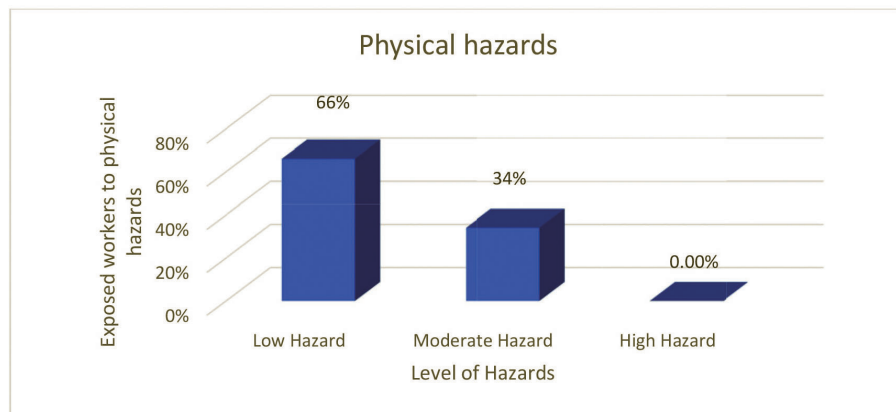
## Results

Over the 53 participants workers 71.7% their age group were (21-30) years old. More than half 52.8% of workers were male and 28.3% were institute graduated. The majority of study samples 73.6% worker works at morning shift and 50.9% of them worked for 48 hours per week. The study also observed that most of workers 81.1% were worked for a period of one to five years, as shown in (Table 1).

It was observed from (Table 2). workers were exposed to different form of physical hazards. Most of them exposed the moderate level of noise and temperature hazards 39 workers (73.6%) and 35 (66.0) %

respectively. While 50 (94.3%) of workers were at low level of lighting hazards and 46 (86.8%) at risk of high electric hazard. In addition, 48 (90.6%) of workers at risk of low level of vibration hazard. The study indicated that the light, electric and vibration hazards were relatively uncommon. Noise and temperature, were rated as moderate or high by over half of the respondents.

Figure 1. Illustrated most of workers were exposed to physical hazards at workplace in which (66%) of workers exposed to low level of physical hazards, (34.0%) of workers were exposed to moderate level of physical hazards while only none of workers at risk of exposed to high level of physical hazards at workplace (n=53).



Mean > 2.34 Low Hazard    Mean > 2.34-3.66 Moderate Hazard    Mean > 3.66-5 High Hazard  
**Fig. 1.** The percentage of exposed workers to physical hazards at workplace (n=53).

**Table 1.** Sociodemographic characteristics of 53 workers at Shampoo factory

Sociodemographic	Frequency	Percent	
Age	<= 20	6	11.3
	21 - 30	38	71.7
	31 - 40	9	17.0
	Total	53	100
Level of Education	Illiterate	4	7.5
	Primary school graduated	10	18.9
	Secondary school graduated	3	5.7
	Intermediate school graduated	11	20.8
	Institute graduated	15	28.3
Sex	College graduated	10	18.9
	Total	53	100
	Male	28	52.8
	Female	25	47.2
Running shifts	Total	53	100
	Morning shift	39	73.6
	Night shift	3	5.7
	Morning and Night shift	11	20.8
Number of working hours/week	Total	53	100
	48	27	50.9
	>48	26	49.1
Duration of work /years	Total	53	100
	< 1	7	13.2
	1-5 years	43	81.1
	6-10 years	3	5.7
Total	53	100	

F=Frequency    %=Percentage

**Table 2.** Exposed worker to type of physical hazards at workplace (n=53).

Type of Physical hazards	Low Hazard No. (%)	Moderate Hazard No. (%)	High Hazard No. (%)
Noise Hazards	5. (9.4)	39. (73.6)	9. (17.0)
Temp Hazards	13. (24.5)	35. (66.0)	5. (9.4)
Light Hazards	50. (94.3)	3. (5.7)	0. (0.)
Electric Hazards	46. (86.8)	6. (11.3)	1. (1.9)
Vibration Hazards	48. (90.6)	2. (3.8)	3. (5.7)

No=Number    %=Percentage

## Discussion

Hazards are just a reflection of the possibility of harm. The health threat's toxicity, the amount of exposure, the severity of the risk factors, and the duration of exposure to the risks are all factors that affect whether or not harm occurs (Mackay *et al.*, 2004). Risks, accidents, and injury in the workplace are all common concepts that must be known.

The current study also showed nearly one third of the workers were exposed to a moderate level of physical hazards at workplace, unfavorable machinery sound, and high temperature, lighting and electrical condition additionally to the risk of vibration at workplace. High number of workers exposed to a moderate level of noise and heat hazards. The most common sources of hazardous noise in the workplace were machinery and equipment. The machines that have a high level of noise are not isolated, and most of the workers are not interested in using hearing protective aids in an area with high noise. Noise-induced hearing loss can just go unnoticed until it interferes with communicating, posing a serious safety hazard (Kumar *et al.*, 2008) (Vlaming *et al.*, 2014). Workplace noise pollution has also been related to negative effects on other body systems (Chen *et al.*, 2017) (Li *et al.*, 2019). Noise exposure in the workplace has a wide range of physiological and psychological effects (Ebare and Isah, 2011) (Ntui, 2009). Yoon, J.H, reveals a relation among occupational noise and the risk of work injuries (Yoon *et al.*, 2016).

Moreover, this study indicated majority of industry workers worked in a hot environment, high temperatures and inadequate ventilation were detected at the workplace. Inappropriate temperature conditions can have an effect on workers' health and productivity (Krishnamurthy *et al.*, 2017), enhancing industry hot environment and providing good air-conditioning at the workplace, especially during hot

season, helps to protect workers from work-related health problems. Beside that the lighting and electrical condition in these factories were in good condition and most of participant factories were new and they concerning about electrical safety. Not exposed wiring where observed that could affect workers health status and disconnecting switches are labeled to indicate their use or equipment served. Additionally, the lighting levels were appropriate for the workers at workplace. Concerning vibrational hazards at workplace majority of workers are exposed to low level of vibration because of the machine and equipment's are stabled in write place and they did not generate vibration.

## Conclusions

Most of the workers were exposed to a low level of physical hazards according to the respondent's rating of five different types of current physical hazards. working in a hot environment with and inadequate ventilation as well as exposing workers to noise due to machine and equipment, were the most common sources of hazardous detected at the workplace. It is necessary to provide awareness sessions and educational health programs regarding occupational health and safety issues to protect the health of the employee. More research is required to find ways to reduce the occupational hazards to minimum and thereby reduce exposure of physical hazards.

## Ethical considerations

Ethical approval for this study was obtained by the ethical committee of the college of nursing and research center department of University of Raporin. A written permission was obtained from the Ministry of trade and factories in KRG and board of investment in Sulaymaniyah Governorate in addition to industries and participants.

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## Conflict of Interest

The author reports no conflict of interest.

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