



# Perceptions of Health and Safety among Workers in the Automotive Repair Industry in Dubai (United Arab Emirates): A Cross-sectional Exploratory Study

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## Abstract

**Background:** Protection of workers against work-related injuries and illnesses is a growing public health concern. The increasing number of expatriate workers in Dubai has highlighted the need for greater emphasis on occupational health and safety, particularly since unintentional injuries were reported to be the second most common cause of death in the United Arab Emirates. **Objectives:** This cross-sectional study explores safety practices and health perceptions of workers in the automotive repair industry, in the light of the Health Belief Model. **Materials and Methods:** The study included 35 automotive repair industry workers, selected by convenience sampling from an automotive workshop in Dubai. Primary data was collected through a structured interview and walk-through survey. **Results:** Only 10% of the workers had received occupational health and safety training from employers. Though the highest perceived hazardous exposure was to carbon monoxide fumes (62.9%), but the majority did not consider the severity of this exposure high enough to be of concern. This discrepancy in perceived vulnerability despite perceived exposure reflects the lack of awareness on severity of exposure to physical and chemical hazards in the car repair shop. A significant relation was seen between cumulative perceptions to exposure to hazards and marital status of the workers, with married workers perceiving greater exposure to hazards at the workplace. Protective equipment was considered important by 83% of the participants but only 54.5% reported using them. **Conclusion:** There is a dire need for targeted occupational health awareness training and enforcement of safety regulations to ensure the safety of workers in the automotive repair industry.

**Keywords:** Automotive Repair Industry, Health Belief Model, Occupational Health, Personal Protective Equipment, Safety

## 1. Key Points

- Only 10% of workers in the repair shop had received training on occupational health and safety.
- A significant relationship was seen between cumulative perceptions to exposure to hazards and marital status of the workers, with married workers perceiving more exposure to hazards at the workplace in general.
- Personal protective equipment was deemed very important by 83% of the participants but only 54.5% reported that they always used them. This can be explained through lack of perceived vulnerability by the Health Belief Model.
- All automotive workers were provided health insurance coverage by the employees as required by the law; similar law enforcement approach can be followed to ensure safety regulations in the car repair industry.
- Around 20.6% of workers stated that they had experienced an injury in the workplace, whereas about 17% workers reported injuries experienced by colleagues.
- While some safety measures are in place, clearly there is a dire need for targeted occupational health awareness training and enforcement of safety regulations to ensure the safety of workers in the automotive repair industry.

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## 2. Background

Protection of workers against work-related injuries and illnesses is a major public health issue that is gaining recognition from employees, workers, governments and the general public. Of the 3 billion workers around the world, 80% do not have access to occupational health services<sup>1</sup>. The concept of basic occupational health has its origins in the World Health Organization Alma Ata Declaration of 1978, which stressed the importance of bringing healthcare close to the workplace<sup>1</sup>. The benefits of workers' protection extend beyond the workers' physical, social and mental health to include safeguarding of valuable skilled workforce and saving on medical costs and compensation<sup>2</sup>. Occupational health contributes to increased productivity, positivity and overall wellbeing of the society: 1. According to Hamalainen, Takala and Kiat (2017), 2.78 million deaths in the world are attributed to the work environment, comprising 5% of the total global total deaths annually<sup>3</sup>. In addition to deaths that are reliably recorded, work-related injuries contribute to a high proportion of people suffering from permanent disability<sup>4</sup>. Adei, Adei and Osei-Bonsu, (2011) reported that the majority of work-related injuries occur in small and medium enterprises attributed to inadequate resources, poor technical capacity and lack of Occupational Safety and Health (OSH) standards<sup>4,5</sup>.

The United Arab Emirates (UAE) is witnessing a tremendous growth in its economy. In addition to oil revenues, the UAE government is seeking to diversify its economy. This has resulted in an expansion of projects, of varying sizes, employing large numbers of expatriates. The increase in volume of expatriate workers has exceeded the capacity of the ministries of health, education and labor to train and employ sufficient numbers of occupational health and safety inspectors to protect workers' health and safety. According to a study on occupational injuries in the UAE, 614 occupational injury hospitalizations were registered in 2009 in the city of Al Ain, an incidence of 136 per 100,000 workers annually<sup>6</sup>. There needs to be a greater emphasis on reducing the incidence and severity of occupational injuries in the UAE especially since unintentional injuries were reported to be the second most common cause of death after cardiovascular diseases<sup>6,7</sup>.

In the UAE, limited studies have been conducted about the occupational health and safety practices of

workers, particularly those in the automotive repair shops despite being the second largest automotive market in the Gulf Cooperation Council after Saudi Arabia<sup>2</sup>. With the expanding automotive industry, the number of employees in the automotive repair shops continues to rise. While the local Municipalities and Ministry of Labor are directly responsible for regulations to ensure the welfare of employees, assessing the safety perceptions and practices of workers is crucial to the success of any occupational health and safety program.

This cross-sectional study aims to explore the safety practices and health perceptions of workers in the automotive repair industry in the light of the health belief model. The findings from this study can form the basis for occupational health awareness initiatives targeting automotive workers in the UAE.

## 3. Methods

To achieve the objectives of this study, a cross-sectional study was conducted among all workers employed in an automotive repair shop in the emirate of Dubai, UAE. Convenience sampling method was used while choosing the automotive repair shop. The automobile repair shop is a private-for-profit company founded 40 years ago. It is located in Dubai, one of the seven emirates in the UAE and surrounded by several automobile repair shops. It employs 40 workers engaged in different car repair activities from repairing of vehicle engines and other mechanical parts to welding, paint spraying and fixing the cars' electrical components. All workers employed in the shop were included in the study. Inclusion criteria were all employees working in the repair shop, which were above 18 years and willing to participate.

### 3.1 Data Collection Tools

A questionnaire was specifically constructed to meet the objectives of this study. It consisted of several parts. The first section collected socio-demographic information about the worker. The second part assessed perceived exposure and severity of hazards, in addition to some cues to action as proposed by the health belief model. The workers' health status, both acute and chronic, was explored in the third section. Some socially sensitive questions including questions on alcohol consumption were kept at the end. The questionnaire was pilot tested on two employees and all questions were found to be

simple and easily understood, except for one that needed some modification.

A checklist was developed to assess the overall physical environment of the shop. The checklist comprised of nine sections: Housekeeping, manual handling, storage, first aid, electrical hazards, safety signs, machinery and equipment, chemical and dangerous goods, in addition to sanitation. The researcher filled the checklist by conducting a walk-through survey for the workshop.

### 3.2 Data Analysis

The data was edited, coded and analyzed using SPSS (version 24) for windows. First, univariate distribution was conducted to assess the variability of every variable under study. Then bivariate analysis was done to assess the relationship between study parameters with the Chi-square ( $\chi^2$ ) test at 5% significance.

### 3.3 Ethical Considerations

Ethical approval to conduct this study was obtained from the Research Ethics Committee at Zayed University. Primary data was collected during May 2018 from the automotive repair workers by means of a structured interview, using the questionnaire described above and supported by the walk-through survey checklist. Informed consent was taken from the participants before starting the interview along with assurance of confidentiality and anonymity. Permission to publish findings while maintaining confidentiality was taken.

## 4. Results

Out of the 40 workers, 35 completed the questionnaire; the remaining 5 workers were on an annual leave. The age of the respondents ranged from 25 to 58 years, with a mean of 35.54 years ( $SD = \pm 9.1$ ). All workers were males. More than two thirds of the respondents (71%) were married. Around 68.6% of workers were Indians 25.7% were from Sri Lanka followed by 2.9% of Pakistani and Bangladeshi workers. More than 50% of the workers had completed high school education while about 28% had completed vocational training; only 9.4% workers had completed university education. Slightly more than one third (37%) of the respondents were either current smokers or ex-smokers. Cigarettes were the only used type of smoking among current smokers and ex-smokers. The duration of smoking ranged from 1 to 15 years, with

a mean of 5.31 years ( $SD = \pm 3.82$  years). Around one quarter of the respondents (23.5%) reported drinking alcohol. Among alcohol consumers, 25% drank 1 cup on a daily basis. Based on their self-reported weight and height, 59% of the employees were overweight (Table 1).

**Table 1.** Socio-demographic profile of the automotive repair workers (n = 35)

Variable	%
Gender	
Male	100
Marital Status	
Single	26.5
Married	70.6
Divorced	2.9
Nationality	
Indian	68.6
Sri Lankan	25.7
Pakistani	2.9
Bangladeshi	2.9
Highest Level of Education	
Completed University	9.4
Completed Vocational (Technical)	28.1
Not Completed Vocational (Technical)	3.1
Completed High School	53.1
Completed Intermediate	6.7
Smoking Status	
Current smoker	20
Ex-smoker	17.1
Nonsmoker	62.9
Alcohol consumption	
Yes	23.5
No	76.5
BMI Classification	
Healthy	34.4
Overweight	59.4
Obese	6.3
Age	
$\bar{x} = 35.54$ years ( $SD = \pm 9.1$ years)	

More than one third of the respondents, 37.1% had been working in their current job for over 10 years, 25.7% had been working for 7–9 years. The cumulative work experience in the automotive repair industry ranged from 2 to 37 years with a mean of 13.50 years ( $SD = \pm 9.85$ ).

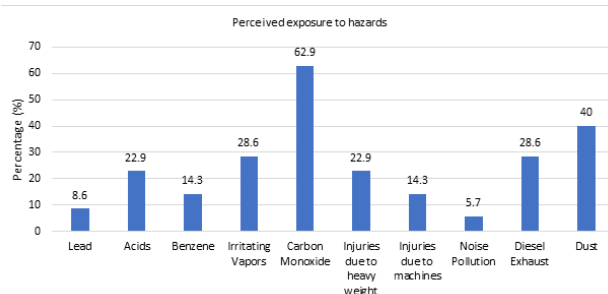
Around 28.6% of respondents were car mechanics; another 28.6% were body repair men and painters made 20% of the work force. All employees were employed on full-time basis and worked 8 hours daily and for 6 days per week. The private repair shop provided health insurance coverage to all of its employees but did not conduct any occupational health or safety training session for the workers. Only 10% of workers had received training on occupational health and safety from previous employers (Table 2).

**Table 2.** Work-related characteristics of the automotive repair workers

Variable	%
Shift system	
No	100
Job specialization	
Coordinator of the workshop	2.9
Office worker	5.7
Painter	20
Body repair technician	28.6
Mechanical	28.6
Battery worker	14.3
Work experience in the current job	
0–12 months	5.7
1–2 years	11.4
3–6 years	20.0
7–9 years	25.7
10 years and more	37.1
Health insurance provided by the employer	
Yes	100
Had attended occupational health and safety training sessions in the previous year	
No	100
Had attended occupational health and safety training sessions during their previous employment	

Variable	%
Yes	10
No	90
Cumulative work experience in the automotive repair industry	
$\bar{x}$ = 13.50 years (SD = ±9.85 years)	

On exploring perception of exposures to physical and chemical hazards, the highest perceived exposure was to carbon monoxide fumes with 62.9% workers believing they were exposed to the gas, followed by perceived dust exposure in 40% and fumes and vapor exposure in 28.6% and diesel exhaust exposure in 28.6% workers. Only 22.9% participants believed they were exposed to acids, 22.9% were prone to injuries due to heavy weight lifting, 14.3% exposed to benzene, 8.6% employees perceived themselves to being exposed to lead, 14.3% felt vulnerable to injuries due to machineries and 5.7% felt they suffered due to noise pollution (Figure 1).



**Figure 1.** Perception of exposure to physical and chemical threats among automotive repair workers.

Interestingly, a significant relation was seen between cumulative perceptions to exposure to hazards and marital status of the workers, with married workers perceiving more exposure to hazards at the workplace in general (Table 3).

**Table 3.** ‘Yes’ to perceived exposure to hazards in relation to marital status among automotive repair workers

		Single	Married	Divorced	Total
Times ‘yes’ chosen for perceived exposure to hazard	0.00	2	5	0	7
	1.00	1	4	0	5
	2.00	3	5	0	8
	3.00	1	5	0	6
	4.00	1	1	0	2

		Single	Married	Divorced	Total
	5.00	1	4	0	5
	10.00	0	0	1	1
Total		9	24	1	34
Asymptomatic significance (2 sided)					0.00*

The severity of lead exposure was considered as moderate by 14.3 % of the respondents. A similar result was reported for severity of benzene exposure. Perceived severity of exposure to acids was considered moderate by 37.1% participants, however 22.9% perceived it as severe. Perceived severity of exposures to irritating vapors and fumes was called moderate by 17.1%, while 29.4% considered perceived severity of Carbon Monoxide exposures as moderate; 11.4% perceived severity of injuries due to heavy weight lifting as moderate, 22.9% perceived severity of injuries due to machineries as low; slightly more than one third of respondents considered severity of exposure to noise pollution as low, only 5.7% perceived severity of exposure to diesel exhaust as high and 11.4% considered severity of exposure to dust as high. Interestingly 29.4% and 23.5% considered exposure to carbon monoxide to being low or at no risk respectively. Generally, other than dust, where 11.4% workers considered the perceived exposure to be high in severity, only 2.9% workers considered other exposures to be of high severity (Figure 2).

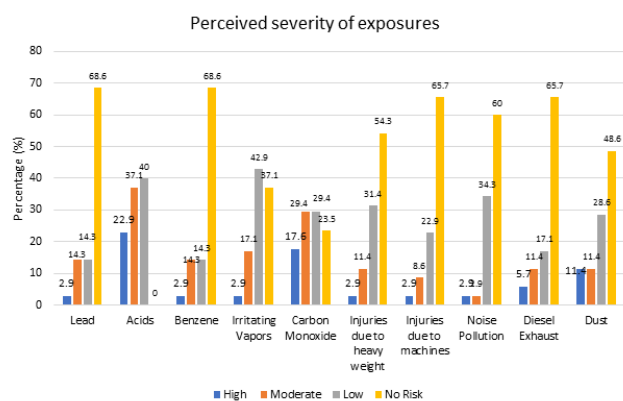


Figure 2. Perception of severity of exposure to physical and chemical threats among automotive repair workers.

According to the Health Belief Model (HBM), workers' motivation to use Personal Protective Equipment (PPE) is influenced by previous personal exposure to injuries or seeing a colleague suffering from a work-related injury. During their occupational history in the automotive

repair industry, 17.6% of the workers had witnessed a colleague suffering from a work-related injury. One third of these injuries were perceived as severe. In addition, 20.6% of the workers themselves had incurred a work-related injury during their occupational history in the automotive industry. Around 30% of these injuries were regarded as moderately severe (Table 4).

Table 4. 'Cues to action' among automotive repair workers

Variable	% (n)
If a colleague suffered from a work-related injury	
Yes	17.6
No	82.4
Severity of the colleagues' injury	
Very severe	33.3
Severe	16.7
Moderately severe	33.3
Light	16.7
If the worker himself sustained a work-related injury	
Yes	20.6
No	79.4
Severity of the workers' injury	
Moderately severe	28.6
Light	71.4

Table 5. PPE - Perception of their importance and usage among automotive repair workers, Dubai, 2018

Variable	%
Workers perception of their importance	
Very important	82.9
Important	17.1
Moderately	
Not important	
Use of PPE	
Always	54.5
Sometimes	45.5



Variable	%
Rarely	
Never	
Reasons for not using PPE	
Discomfort	100
Lack of availability 0	
PPE is ineffective 0	

Interestingly, PPE was deemed very important by 83% of the participants but only 54.5% reported that they always used them. The reason given for not using PPE was the discomfort associated with the PPE usage (Table 5). On merging the perceived exposure to all types of inhalation fumes, dust and vapors together and cross tabulating with usage of PPE, we found a significant relationship of PPE usage among workers who perceived themselves as exposed to various types of fumes and vapors (Table 6).

**Table 6.** PPE usage in relation to perceived exposure to all fumes and vapors among automotive repair workers

'Yes' to fumes	Always	Sometimes	Total
.00	3	8	11
1.00	6	2	8
2.00	5	5	10
3.00	4	0	4
Total	18	15	33
Asymptomatic significance (2 sided)			0.045*

Among the automotive workers, only 5.7% reported breathing problems, 5.7% complained of skin rashes, 14.3% reported sleeping problems, 2.9% reported vision problems and a similar percentage reported back pain in the last month. Hypertension was the major chronic condition that workers suffered from (14.3%), followed by asthma, diabetes and cancer (2.9% for each health condition). More than half of the workers (57%) had a family history of chronic diseases. Out of those who reported family history of chronic diseases, 60% had a self-reported co morbidity of hypertension and diabetes.

#### 4.1 Findings on Walk-through Survey

The private automobile repair shop was divided into separate non-labeled working stations. However, the place was relatively small and was not air-conditioned which would translate into increased discomfort for workers in

hot weather. Under housekeeping, it was seen that the status of the floor differed according to the type of station; some floors had water and oil spillage on the floor while others were clean. This finding was in accordance to the different jobs performed in these areas; for example, benzene byproducts were seen on the floor where body repairing took place whereas areas where battery repair took place were free from benzene byproducts on the floor. The floor surface was even throughout the shop and no loose tiles were spotted. However, the walkways were not entirely clear; workers placed their toolboxes beside them in the walkways, due to limited working space available to them. Each worker had his own toolbox to help him in carrying out his daily tasks. Workstations were very crowded and messy. Workers needed to be cautious while moving from one place to another to prevent tripping injuries from tools and equipment. In contrast, the stairways were clear of obstructions which made them easy to use. There were separate storage areas for paints, as each car brand has its own specific paint. However, no equipment was stored on the shelves. First aid kits were available and accessible to all workers. The contents were clean, well-organized and clearly labeled to facilitate proper identification. The expiry dates on first aid kits was checked and found to be in order. According to the coordinator of the workshop, electrical appliances had not been inspected and tagged; extensions cords and power boards had not been maintained according to safe operating condition; for example, it was noticed that one switchboard was on while nobody was working on that equipment. Most wires were in a fine condition except for only one that had a breach in the insulation material. Safety signs were clearly displayed all over the workshop in a big size and large font. The emergency procedure was well displayed in signage for workers in different places. All the exits were clearly marked and free from obstructions and the location of fire alarms and firefighting equipment were clearly identified and located in most sections. Fire sprinklers were seen on the ceiling of all sections which were connected to a single pump so that all the fire sprinklers would work immediately in case of a fire. Furthermore, appropriate warning signs were displayed in hazardous areas to alert workers to wear suitable PPE to prevent unintentional injuries and disease. Though PPE was supplied by the company, from this single walk-through observation it was seen that the majority of employees were not using all the PPE provided, while some did not wear any PPE at all. This observation was contradictory to what the

workers reported in the survey. Chemical and hazardous substances were clearly labeled and safely stored, but there was no ventilation or exhaust system since the workshop environment was open which can reduce air conditioning effectiveness. Safety data sheets were readily available, so workers could easily access them. As for sanitation, the last section of the checklist, the bathrooms were smelly and dirty; however, the employee break room was clean. Also, a proper segregation of solid wastes into hazardous and general wastes was observed.

## 5. Discussion

The objective of this cross-sectional study was to explore the safety practices and health perception of workers in the automotive repair industry in the UAE in the light of the HBM. The HBM rests on the concept that health behaviors and decisions related to health depend upon perceptions of health. The four perceptions that define the model are: perceived seriousness; when a person believes that the health concern is serious enough to consider making a change, perceived susceptibility; if perceived vulnerability is high, the chances of taking action to avert the health risk are higher, perceived benefits; when people believe a health behavior change will reap benefits, there is a higher incentive to make the change and lastly perceived barriers; how difficult the health behavior change is; in individual's view, this influences whether the new behavior will be adopted<sup>8</sup>. Based on this model, automotive workers who believe they are at risk for serious health problems and injuries in the workplace should be more willing to adopt the safety procedures that are available to them despite inconveniences associated with the health and safety precautions.

All of the workers in this study were males; this is not an unusual finding as other studies have also shown the automotive industry to comprise of males predominantly<sup>5,9,10</sup>. This finding is in accordance with the sociocultural norms of the UAE society that typically associates manual and laborious job with males<sup>11</sup>.

As mentioned in Philip et al's study on morbidity in automobile industry in south India and a study in Italy, that health and safety practices are not of utmost priority in small workplaces<sup>12,13</sup>. This study highlighted that safety training had never been provided to automotive workers at this particular workplace. Those who had received occupational health training had done so in other

workplaces. This resonates the possibility that smaller workplaces may be less particular in their safety protocols. The study in South India indicated very low awareness on occupational health which explained the low use of PPE at that workplace. Contrary to our study where safety and first aid equipment was visibly present, the automobile service shop in India revealed absence of first aid kits, fire extinguishers and safety equipment. Perceived exposure to dust was 76% compared to 40% in this study. Overall perception of exposure to chemicals and hazardous agents in this study ranged from 8.6%-62%, with highest perceived exposure reported for carbon monoxide, whereas Philip et al reported perceived exposure ranging from 50-90.6%, much higher than findings from this study<sup>12</sup>. The findings indicate that despite being a small-scale workplace, health and safety conditions had not been disregarded in this automotive workplace in UAE.

The vocational training that more than one quarter of the workers had completed in this workplace could have imparted to them the necessary skills needed to perform their jobs efficiently and safely. In addition, this shop was characterized by a low turn-over rate as around two thirds of the automotive workers had been working for over 7 years. This also confers a sense of job security to the workers and a less stressful work environment. The presence of safety signs in all sections of the shop, as seen on observation of the physical environment, could also explain the relatively good safety perception.

Only 51% of the workers claimed they always used PPE, even though 83% had agreed on the importance of PPE; there was a difference between what workers said they believed in and their actual practice. Further, on survey by the investigators, very few people were seen using PPE, which indicated a diminished sense of perceived vulnerability. Lack of comfort associated with PPE use was the only cited reason for not wearing them, this could be considered as the perceived barrier which can only be overcome once workers understand the severity and risk associated with lack of PPE use. This finding agrees with findings of other studies, who also found that workers know that PPE are helpful in preventing work-related injuries, yet the majority of them did not wear these PPE due to the discomfort attributed with their use<sup>14,15</sup>. Interestingly though, workers who perceived to be exposed to hazardous fumes and vapors including carbon monoxide, diesel exhaust, dust had a significantly higher self-claimed use of PPE. No training sessions or workshops on the importance of PPE were

conducted by the management to rectify the situation. Since PPE are an important mechanism of defense against hazards, especially for paint sprayers, then there is a need to enforce the use of PPE among the automotive repair shop workers. The UAE government was effective in implementing the medical insurance law as all automotive workers had insurance coverage; a similar approach can be followed in enforcing safety regulations in the car repair industry (Oxford Press 2015; Government.ae 2018)<sup>16,17</sup>.

More than half of workers perceived that Carbon monoxide had the highest threat to their health. This is a scientifically valid danger as inhalation of exhaust fumes contributed to most unintentional Carbon monoxide related-deaths in the USA. Even low concentrations of Carbon monoxide can induce subtle cardiovascular or neurobehavioral effects<sup>18</sup>. It is interesting to note that there was a difference between workers' perception of exposure to hazards and the severity of that exposure. For example, only 17.6% considered the severity of exposure to carbon monoxide to be high, even though 62.9% believed they were exposed to carbon monoxide. Similarly, 40% of workers considered themselves as exposed to dust while only 11% considered the dust exposure to be severe. Studies have shown that work-related dust can cause considerable health risks as it can carry several heavy metals; exposure to such dust can induce emphysema, lung cancer and other pulmonary conditions<sup>19</sup>. This discrepancy in perceived vulnerability despite perceived exposure reflects on the lack of awareness on severity of exposure to physical and chemical hazards in the car repair shop. Hence there is a need for conducting health and safety training sessions about the occupational hazards that can be encountered in the car repair industry. Without acknowledgement of the potential work-related hazards, the adoption of preventive safety practices will be deficient.

In this study, 20.6% of workers stated that they had experienced an injury in the workplace, whereas about 17% workers reported injuries experienced by colleagues. This figure seemed to be much higher than the average of 283 occupational injuries reported annually in Al Ain, registry and the reported 27 per 100,000 unintentional injuries, including occupational injuries in 2004 in UAE<sup>6</sup>. However, the findings should be considered while acknowledging the small sample size of this study, the different time frames and the focus on injuries in only

the automotive industry. Nonetheless, when compared to an automotive repair workshop in Ghana, two thirds of the workers had sustained work related injuries<sup>9</sup>. Interestingly, it was seen that marital status was seen to have a significant association with the incidence of injuries in the workplace<sup>9</sup>. While this study did not elicit such a relationship, it did show a significant relationship between marital status and perceived exposure to hazards in the work environment. This finding indicates the possibility that married men are more conscious of the influence of their surroundings on their health. This finding resonates research that underscores the influence of spouses on health behavior; married men are swayed into thinking about health due to the presence of female influence in their lives<sup>20</sup>.

The major acute health problem that employees complained of was problems with sleeping. Evidence coming from the scientific literature documents are those who work in the shift system tend to experience sleep disturbances<sup>21</sup>. As the shift system was not applied in this private company, this finding merits further exploration. Skin rashes and breathing issues were mentioned under acute health issues, as have been observed in other studies<sup>12</sup>; however, the percentage of complaints of rash was considerably lower than seen in a study on automotive repair shops in Egypt, but comparable to a study done in South India. On the other hand, breathing problems were reportedly higher in the study conducted in south India and Ghana<sup>9,22</sup>.

Hypertension was the most common chronic disease reported in this study. Interestingly, a study supports the association of hypertension in noisy workplaces. Noise stimulates release of stress hormones which can translate into high blood pressure and heart rate<sup>23</sup>. However, this study showed that only 5.7% of the participants felt they were exposed to noise pollution, while 14.3% had reported they were hypertensive. We were unable to elicit a significant relationship between perception of noise pollution and hypertension; however, there is potential for further exploration in a study with a larger sample size.

## 6. Strengths and Weaknesses

The findings of this study need to be considered in the light of some strengths and weaknesses of the research process. The study was conducted in one workshop only,



the workshop was chosen due to convenience in terms of accessibility and ease in permission to conduct a study at this workplace; thus, a non-probability sample was used. Despite being a single workplace under study, the proximity to several other automotive workshops in the vicinity could make the findings more relevant to the automotive workforce. Only a small number of workers were included in the sample. The small sample size could explain why significant associations were not found during data analysis<sup>24</sup>. However, although it was a small sample, there was a response rate of 100% from workers who were asked to complete the survey, which lends credibility to the perceptions unearthed<sup>25</sup>.

The questionnaire was developed using supporting literature, specifically for the automotive industry in the UAE and keeping in mind the sociocultural factors unique to the region. Questionnaires were answered in the presence of the researcher, which gave respondents the opportunity to ask for clarifications where needed<sup>25</sup>. The findings were further supported by triangulation in the form of the walk-through survey of the physical environment by the researcher. The findings of this study can serve as a pilot study for many potentially larger studies in this research area while serving as a baseline for further health promotion programs targeting automotive health workers.

The study was the first study in UAE that assessed the perceptions of safety and exposure to occupational hazards in the automotive workshops and associated findings to the Health Belief Model.

## 7. Conclusion

The benefits of workers' protection extend beyond the workers' physical, social and mental health to include safeguarding of valuable skilled workforce and saving on medical costs and compensation. Occupational health contributes to increased productivity, positivity and overall wellbeing of the society and is thus becoming increasingly recognized as a public health concern. With the rapidly expanding automotive industry in the UAE, there is a greater need for awareness and readiness to cope with occupational hazards. This needs to be done not only at the management level but by empowering the people who are at risk to prevent, protect, recognize and alleviate injuries from occupational hazards. According to the HBM, increasing awareness translates into increased perceived risk and improves the chances of adoption of

preventative safety measures and preparedness in case of an occupational emergency. This cross-sectional descriptive study indicates that some safety measures are in place in a small automotive workshop; however, clearly there is a dire need for targeted occupational health awareness training and enforcement of safety regulations to ensure the safety of workers in the automotive repair industry in the UAE.

## 8. List of Abbreviations

OSH - Occupational Health and Safety.

HBM - Health Belief Model.

PPE - Personal Protective Equipment.

UAE - United Arab Emirates.

## 9. Declarations

Ethics approval and consent to participate.

The study has been approved by the Zayed University Ethics Committee. Informed consent was taken from the participants before starting the interview along with assurance of confidentiality and anonymity. Permission to publish findings while maintaining confidentiality was taken.

## 10. Consent for Publication

Written informed consent was obtained from the participants for publication of data acquired in this manuscript.

## 11. Availability of Data and Material

The datasets generated and analyzed during the current study are not publicly available to maintain confidentiality of the participants but are available from the corresponding author on reasonable request

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