

# Health Consequence of Gas Filling on the Workers' Health of Two Cities in Iraq (Comparative Study)

Hussein Ali Mohammed <sup>1</sup>, Wijdan Abdulameer Kamel <sup>2</sup>, Abid Salih Kumait <sup>3</sup>

<sup>1</sup>Lecturer, Department of Adult Nursing, University of Kirkuk, College of Nursing, <sup>2</sup>Assistant lecture, Department of basic nursing science, University of Kirkuk, College of Nursing, <sup>3</sup>Ph.D. Assistant Professor, Department of Adult Nursing, University of Kirkuk, College of Nursing

## Abstract

A gas is a sample of matter that conforms to the shape of a container in which it is held and acquires a uniform density inside the container, even in the presence of gravity and regardless of the amount of substance in the container. If not confined to a container, gaseous matter, also known as vapor, will disperse into space. The term gas is also used in reference to the state, or condition, of matter having this property.

**Aims:** To identify the demographic data of the worker and to comparative between kirkuk gas filling company and Tikrit gas filling company among work hazards like health, physical, chemical, physiological, mechanical hazards.

**Methodology:** Quantitative design (comparative study) was conducted for worker in company gas filling in Tikrit (Salah aldin) and Kirkuk city the study was carried out from the 10<sup>th</sup> February 2020 to 13<sup>th</sup> August 2020. This study was conducted in Kirkuk city and Tikrit (Salah aldin). The present study was conducted in two company of gas filling: Company gas filling / branch Kirkuk and Company gas filling / branch salah Eldin. The data was prepared, organized and coded into the computer file; Statistical Package for Social Science (SPSS) version (24) was used for data analysis

**Results** the result of demographic data for both kirkuk and Tikrit city shows that the age group (20-29 years) represents a high percentage in the Kirkuk gas and Tikrit city and represent (40.0%) and (38.0%) respectively, with regard to the gender the results shows high percentage from gender were male in kirkuk and tikrit and represent (95.0%) and (98.0%) respectively, also the result shows the kirkuk workers were more less effected than tikrit workers also the results shows the chemical, mechanical and psychosocial hazard was effect in tikrit workers more than kirkuk workers.

**Key word:** Health consequence, Gas Filling, workers health

## Introduction

A gas is characterized as a detail of issue comprising of particles that have neither a characterized volume nor characterized shape. It is one of the four essential conditions of issue, alongside solids, fluids, and plasma. Under customary conditions, the gas state is between the fluid and plasma states. A gas may comprise of molecules of one component (e.g., H<sub>2</sub>, Ar) or of mixes (e.g., HCl, CO<sub>2</sub>) or blends (e.g., air, characteristic gas)<sup>(1)</sup> Flammable gas is utilized in numerous homes for warming and cooking. Lamentably, petroleum gas holes

may happen without the mortgage holder in any event, acknowledging there is a gas spill. A few people's feeling of smell is extremely delicate to gaseous petrol, while others can't smell it by any means. Seeing a portion of the notice indications of a petroleum gas spill in the home might just spare a daily existence<sup>(2)</sup> Cerebral pains and Dizziness, for some people, the primary indication of a gas break might be a migraine. While huge numbers of us experience migraines every day, unexpected or unexplainable cerebral pains ought to never be disregarded. On the off chance that the migraine doesn't disappear after you go outside for

some time, or while you're grinding away, consider the possibility that you may have a flammable gas spill. People may encounter episodes of dazedness alongside a cerebral pain. Ask other relatives or flat mates in the event that they're encountering episodes of cerebral pains and dazedness also <sup>(3)</sup> Queasiness, Along with migraines and wooziness, people presented to a gaseous petrol hole may likewise encounter sickness. Such manifestations might be exacerbated if the house is quit for the day winter, or if the carport or storm cellar isn't appropriately ventilated. Sporadic Breathing, A flammable gas hole may cause trouble or unpredictable taking in a few, particularly the youthful and older. note that a gaseous petrol break may suck oxygen from the air and produce substantial measures of carbon dioxide, which can prompt trouble breathing that may diminish the measure of oxygen in your lungs and blood and cause obviousness. Weariness, Some people presented to a petroleum gas spill additionally feel a mind-boggling feeling of exhaustion or dormancy. As a rule, this is brought about by absence of sufficient oxygen stream in the body. An individual ought to recuperate rapidly whenever moved to an alternate area. <sup>(4)</sup>

### Methodology

Quantitative design (comparative study) was conducted for worker in company gas filling in Tikrit (Salah aldin )and Kirkuk city the study was carried out from the 10<sup>th</sup> February 2020 to 13<sup>th</sup> Augst 2020

This study was conducted in Kirkuk city and Tikrit (Salah aldin ). The present study was conducted in two company of gas filling:Company gas filling / branch Kirkuk and Company gas filling / branch salah Eldin.

The Sample of the study consist of from a non-probability (purposive) sample was selected. It consisted of (200) workers .(100) workers of sample was collected from mechanical Company gas of Kirkuk City and (100) manual company gas of mechanical Company gas of Salah Eldin City.

The study instrument (questionnaire) was consisted of three major parts to meet the purposes of study. The first part is related to workers demographical characteristics such as (age, gender, residence, marital status, department, educational attainment, monthly income, years of service, time of work per day, training, and number of training), the second part is related to Health Hazards these part include Physical health hazards: They consist of (9)items ,chemical health hazards, they consist of (8) items ,mechanical health hazards: they consist of (7) items ,Psychological health hazards: They consist of (5) items and biological health hazards: They consist of (5) items and the third part is related to precautionary measures They consist of (11) items . The overall items were ( 56) items, by using the scale (Agree=3), (Neutral =2), (Disagreement =1). Content validity was determined by presenting the questionnaire to a panel of (11) experts in different specializations, six in medical surgical nursing, three in community health nursing ,and two in maternity and child health .The data collection was carried out for the period from the 10<sup>th</sup> February 2020 to 10<sup>th</sup> April 2020

The data was prepared, organized and coded into the computer file; Statistical Package for Social Science (SPSS) version (24) was used for data analysis

### Result of the study :-

**Table (1) :** Distribution of the sample according to demographic characteristics (200) samples

Variable	Kirkuk city		Tikrit city	
	frequency	percentag	frequency	percentag
Age				
20-29yrs	40	40.0	38	38.0
30-39yrs	26	29.0	29	29.0
40-49 yrs	19	19.0	23	23.0

**Cont... Table (1) : Distribution of the sample according to demographic characteristics (200) samples**

50-59 yrs	9.0	9.0	8	8.0
60-69 yrs	4	4.0	1	1.0
70 yrs and more than	2	2.0	1	1.0
Total	100	100%	100	100%
Gender	F	%	F	%
Male	95	95.0	98	98.0
Female	5	5.0	2	2.0
Total	100	100%	100	100%
Department	F	%	F	%
Direct	78	78.0%	82	82.0
InDirect	22	22.0%	18	18.0
Total	100	100%	100	100%
Time of work per day	F	%	F	%
2 -4 hours	10	10.0%	12	12.0
4-6 hours	12	12.0%	15	15.0
6-8 hours	78.0	78.0%	73	73.0
Total	100	100%	100	100%

Table (1) show results The demographic data for both Kirkuk and Tikrit city the result shows that the age group (20-29 years) represents a high percentage in the Kirkuk gas and Tikrit city and represent (40.0%) and (38.0%) respectively, with regard to the gender the results show high percentage from gender were male in Kirkuk and Tikrit and represent (95.0%) and (98.0%) respectively. Also the result shows high percentage

from workers was worked at direct department contact in Kirkuk and Tikrit and represent (78.0%) and (82.0%) respectively, finally the time of work per day the results show the worker were work from (6-8) hrs per day and represent (78.0%) and (73.0%) in Kirkuk and Tikrit respectively.

**Table (2) Compative about awareness of gas station workers regarding physical hazard at at Kirkuk city and Tikrit city**

No	items	Kirkuk city		Tikrit city	
		Mean	Assess of awareness	Mean	Assess of awareness
1	The noise level in my work place is relatively high	2.6	HA	2.8	HA
2	Loss of hearing could result from exposure to load noise	2.7	HA	2.4	MA
3	My job function has to do with working with object ,tool, equipment, machine, chemical, that has high temperature	2.7	HA	2.7	HA
4	Extreme heat could cause body cramp	2.5	HA	2.6	HA
5	When you carry gas bottles you feel back pain	2.6	HA	2.5	HA
6	Vibration could disorder the spine & cause fatigue	2.6	HA	2.8	HA
7	Radiation like in welding radioactive substance could be emitted as I perform my job function	2.4	MA	2.5	HA
8	Radiation could cause cancer & premature skin aging	2.8	HA	2.9	HA
9	Carry gas bottles every day	2.2	MA	2.3	MA

\*H.A.= High Awareness, M.A.=Moderate Awareness, L.A.=Low Awareness

Table (2) this table shows that mean of scores of Workers Staff of kirkuk and tikrit city was high Awareness in all items

**Table (3): comparative about Awareness of gas station workers regarding Chemical Health Hazards at Kirkuk city and tikrit city**

No	items	Kirkuk city		Tikrit city	
		Mean	Assess of awareness	Mean	Assess of awareness
1	Working with chemical substances is part of may job function	2.3	MA	2.6	HS
2	The substance are solvent, mist, fum ,and gas	2.5	HA	2.7	HA
3	The chemical /gases are flammable, poisonous & corrosive	2.6	HA	2.8	HA
4	The hazardous chemicals are sometimes inhald, ingested, injected and spill over my skin	2.0	MA	2.7	HA
5	Eating where there are chemical is highly prohibited	1.8	MA	2.7	HA

**Cont.... Table (3): comparative about Awareness of gas station workers regarding Chemical Health Hazards at Kirkuk city and tikrit city**

6	Chemical hazards are likely to affect ones health when they are exposed to them for a long period of time	2.6	HA	2.5	HA
7	Exposure to chemical hazards could cause reproductive disorder , cardiovascular diseases , respiratory disease, renal disease	2.0	MA	2.6	HA
8	The health impact of chemical hazards could lead to loss of life	2.6	HA	2.7	HA

\*H.A.= High Awareness, M.A.=Moderate Awareness, L.A.=Low Awareness

Table (3) this table shows that mean of scores of Workers Staff of tikrit city was high Awareness in all items in comparative of kirkuk city which was was moderate Awareness

**Table (4): comparative about Awareness of gas station workers regarding Mechanical Health Hazards at Kirkuk city and tikrit city**

No	items	Kirkuk city		Tikrit city	
		Mean	Assess of awareness	Mean	Assess of awareness
1	Working with chemical substances is part of may job function	2.3	MA	2.6	HA
2	The substance are solvent, mist, fum ,and gas	2.5	HA	2.7	HA
3	The chemical /gases are flammable, poisonous & corrosive	2.6	HA	2.8	HA
4	The hazardous chemicals are sometimes inhald, ingested, injected and spill over my skin	2.0	MA	2.7	HA
5	Eating where there are chemical is highly prohibited	1.8	MA	2.7	HA
6	Chemical hazards are likely to affect ones health when they are exposed to them for a long period of time	2.6	HA	2.5	HA
7	Exposure to chemical hazards could cause reproductive disorder , cardiovascular diseases , respiratory disease, renal disease	2.0	MA	2.6	HA
8	The health impact of chemical hazards could lead to loss of life	2.6	HA	2.7	HA

\*H.A.= High Awareness, M.A.=Moderate Awareness, L.A.=Low Awareness

Table (4) this table shows that mean of scores of Workers Staff of tikrit city was high Awareness in all items in comparative of kirkuk city which was moderate Awareness

**Table (5): comparative about Awareness of gas station workers regarding Psychosocial Health Hazards at Kirkuk city and tikrit city**

No	items	Kirkuk city		Tikrit city	
		Mean	Assess of awareness	Mean	Assess of awareness
1	My workload is very challenging	2.0	M.A	2.6	HA
2	I would like to be transferred to another unit /department	2.1	M.A	2.7	HA
3	I work in solation	2.1	M.A	2.8	HA
4	I an faced with some kind of aggression & harassment in my place of work	1.2	L.A	2.7	HA
5	Psycho social hazards could cause hypertension, anxiety boredom	2.2	M.A	2.7	HA

\*H.A.= High Awareness, M.A.=Moderate Awareness, L.A.=Low Awareness

Table (5) this table shows that mean of scores of Workers Staff of tikrit city was high Awareness in all items in comparative of kirkuk city which was moderate and low Awareness

**Table (6): comparative about Awareness of gas station workers regarding Biological Health Hazards at Kirkuk city and tikrit city**

No	items	Kirkuk city		Tikrit city	
		Mean	Assess of awareness	Mean	Assess of awareness
1	Microbes could be found in some substance I work with in my work station	1.6	L.A	2.3	MA
2	I general hazardous waste while working	2.2	M.A	2.2	MA
3	some of this hazardous waste could impact on the health of workers	2.1	M.A	2.6	HA
4	Biological hazards could cause Tuberculosis, pneumonitis	2.0	M.A	2.4	HA
5	proper environmental hygiene is lacking in my place of work	1.9	M.A	2.0	MA

\*H.A.= High Awareness, M.A.=Moderate Awareness, L.A.=Low Awareness

Table (6) this table shows that mean of scores of Workers Staff of tikrit city was high and moderate Awareness in all items in comparative of kirkuk city which was moderate Awareness

### Discussion of the Results

The Results shows in Table (1) had revealed that an age group was high at ( 30-39 )yrs in both kirkuk company gas filling and tikrit company gas filling and constitute 26.0% and 29.0 respectively

Explanation of this result because the system in our country most of the graduates students from the Institute of oil and gas direct work in the Kirkuk and tikrit gas company there for we find high percentage from the workers at age( 30-39 )yrs in both kirkuk and tikrit gas company

Our result is agreement with other study conducted by Achalu 2016 found that the staff of age group greater percent within (30-40 years) and constitute 30.0%

Also the result of the present study indicate The staff were male is high percentage in company gas filling / branch Kirkuk and branch tikrit ,and constitute 95.0% and 98.0% in both kirkuk and tikrit company respectively

Interpret of this result Because of the work at company need heavy work and dangerous and carrying heavy things there for we find great percentage from workers was male.

The current investigation is concurrence with Heymann (2016) discovered Sample included 90.5% (n=200) guys and 9.5% (n=21) females in Because of substantial work and perilous and conveying overwhelming things to be the most male laborers due to the working environment<sup>(5)</sup>

Likewise the outcomes shows the high rate 78.0% and 82.0% were immediate contact to the gas from kirkuk and tikrit respectively

The decipher of this outcome identified with the kind of work at gas organization and the organization gas filling is more requirement for physically laborers there for we discover high rate were immediate contact . With regard to the time of work per day the results of the present study show that the highest percentage is 78.0% and 73.0% were work (6-8) hours at kirkuk and tikrit

respectively .the explanation of this result related to the system work at gas filling company need for long time working there for we find high percentage from workers work for at least 6-8 hours

Table (2) Comparative about awareness of gas station workers regarding physical hazard at at Kirkuk city and Tikrit city the result of this table shows that mean of scores of workers staff of kirkuk and tikrit city was high Awareness in all items

Physical dangers that influence wellbeing laborers incorporate introduction to commotion, vibration, ionizing and no ionizing radiation, and power. With the exception of very noisy commotion of a hazardous or effect nature where some measure of hearing misfortune and additionally auxiliary harm happens (acoustic injury), uproarious clamor at first uniform the sensitive hair cells in the inward ear causing a move in hearing limit. This is known as a transitory limit move (TTS) (6).

A basic test can be led by laborers to survey the impacts of word related introduction to clamor and its effect on hearing sharpness a few substances might be basically innocuous in certain structures, (for example, a square of metal, a bit of wood or granulated strong synthetic compounds) however might be perilous in another structure, (for example, fine residue particles or smoke that can be promptly breathed in or arrangements that might be sprinkled and promptly consumed through skin). This is additionally a significant thought in surveying dangers from physicochemical risks. The grouping of risky fixings is likewise a significant factor in the general hazard. Concentrates or unadulterated substances might be amazingly dangerous, while weaken arrangements of a similar concoction may not be risky at all. The extraordinary warmth of welding and starts can cause consumes. Eye wounds have come about because of contact with hot slag, metal chips, sparkles, and hot terminals. Furthermore, over the top presentation to warmth can bring about warmth stress or warmth stroke. Welders ought to know about the side effects, for example, exhaustion, unsteadiness, loss of hunger, sickness, stomach torment, and fractiousness. Ventilation, protecting, rest breaks, and remaining hydrated will ensure against heat<sup>(7)</sup>

**Table (3):comparative about** Awareness of gas station workers regarding Chemical Health Hazards at

Kirkuk city and Tikrit city ,this table shows that mean of scores of Workers Staff of Tikrit city was high Awareness in all items in comparative of kirkuk city which was was moderate Awareness

The explanation of this result related to safety measure at Kirkuk gas company more than Tikrit gas company

Exposure standards are based on the airborne concentrations of individual substances that, according to current knowledge, should neither impair the health of, nor cause undue discomfort to, nearly all workers. They do not represent a fine dividing line between a healthy and unhealthy work environment. Chemicals with workplace exposure standards are listed in the *Workplace Exposure Standards for Airborne Contaminants*. These exposure standards are also available from the Hazardous Substances Information System (HSIS) on the Safe Work Australia website. The HSIS database contains additional information and guidance for many substances. Although exposure standards may also be listed in Section 8 of the SDS, you should always check the *Workplace Exposure Standards for Airborne Contaminants* **Some** substances give off distinctive odours which can alert workers to the presence of a hazardous chemical. For example, hydrogen cyanide has a smell of bitter almonds. However, not everyone can smell hydrogen cyanide and higher concentrations of hydrogen cyanide can also overload nasal receptors resulting in workers being unable to detect it. Hazardous chemicals can also have no odour. Thus, odour should not be relied on as a means of detecting the presence of hazardous chemical<sup>(8)</sup>

**Table (4):comparative about** Awareness of gas station workers regarding Mechanical Health Hazards at Kirkuk city and Tikrit city ,this table shows that mean of scores of Workers Staff of Tikrit city was high Awareness in all items in comparative of Kirkuk city which was moderate Awareness

Interpret of this result refers to the types of work at Tikrit gas company more hard than Kirkuk gas company

**Table (5):comparative about** Awareness of gas station workers regarding Psychosocial Health Hazards at Kirkuk city and tikrit city ,this table shows that mean of scores of Workers Staff of tikrit city was high Awareness in all items in comparative of kirkuk city

which was was moderate and low Awareness

absence of inspiration and regard, prompting low degrees of efficiency. Factors, for example, quality client support, group attachment and group building are influenced because of representative truancy and absence of interest. Significant levels of representative turnover are additionally experienced. While trying to decrease representatives being exhausted and feeling less enthused while at work, it is significant that those at the top, for example, supervisors perceive the pressure and weights felt by representatives when they are given such a large number of duties. Administrators must devise approaches to draw out the best in representatives to propel them and lift their regard to guarantee an occupation all around done. This can be as straightforward as regarding representatives as a greater amount of a resource for the association by demonstrating gratefulness for their difficult work and commitment. Notwithstanding how extreme, solid and versatile you think you are, toward the day's end, we are for the most part people, and as such bosses should avoid seeing them as machines. There's a cutoff to the amount we can propel ourselves truly, yet our enthusiastic perseverance can be driven much further. It's essential to know your cutoff points by methods for working SMART. You're nothing but bad to anybody, in particular yourself in case you're not in top mental and physical condition<sup>(9)</sup>

**Table (6):comparative about** Awareness of gas station workers regarding Biological Health Hazards at Kirkuk city and tikrit city this table shows that mean of scores of Workers Staff of tikrit city was high and moderate Awareness in all items in comparative of kirkuk city which was was moderate Awareness

Eduardodiashealth (2016) report that the Gasoline, a straightforward, fluid got from oil contains two fundamental synthetics: benzene (C6H6) and other known cancer-causing agents. Cancer-causing agents don't straightforwardly influence DNA, however lead to malignant growth in different manners. For instance, they may make cells isolate at a quicker than ordinary rate, which could build the odds of changes to DNA. Note that not all cancer-causing agents bring about malignancy. Numerous variables must be contemplated length and power of the exposure<sup>(10)</sup>.

Wluk (2018) report that the natural and irresistible

specialists might be sent to an individual through inward breath, infusion, or by skin contact. Sources incorporate patients, asymptomatic transporters, or vectors, for example, rodents, cockroaches, and mosquitoes. The quantity of living beings in nature, combined with their destructiveness and an individual's protection from them, decide if the individual will get the infection or not. A contamination control program ought to characterize the fundamental strategies, methodology, and practices so as to limit the danger of malady event and transmission at a human services office. This necessitates laborers be counseled and that the exertion is bolstered by the entirety of the executives and staff<sup>(11)</sup>.

### Conclusions

The demographic data for both Kirkuk and Tikrit city the result shows that the age group (20-29 years) represents a high percentage in the Kirkuk gas and Tikrit city and represent (40.0%) and (38.0%) respectively. With regard to the gender the results shows high percentage from gender were male in Kirkuk and Tikrit and represent (95.0%) and (98.0%) respectively. Also the result shows high percentage from workers who worked at direct department contact in Kirkuk and Tikrit and represent (78.0%) and (82.0%) respectively. The physical hazard were same level in both Tikrit and Kirkuk workers. The results show the psychological, biological and psychological hazards most common at Tikrit workers than Kirkuk.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Adult Nursing and all experiments were carried out in accordance with approved guidelines.

### References

1. Anne M Trainor, Entekin, A Trainor, J Saiers, L Patterson, K Maloney, J Fargione, Environmental science & technology. 2017; 51 (5): 2563-2573
2. Denise K, J Bahl, S Krauss, D Kühnert, M Fourment, G Raven. Phylodynamics with migration: a computational framework to quantify. 2017.
3. Lehoux D, Parapegmata, Astrology, Weather, and Calendars in the Ancient World, (thesis), National Library of Canada; includes a list of surviving parapegmata (plural of 'parapegma') and bibliography. 2018.
4. Retzer KD, Hill R, Pratt SG. Restricted Data under NIOSH MOU, editor. Washington, DC: United2013. Motor vehicle fatalities among oilfield workers. Environmental and occupational medicine, 3rd ed. Philadelphia, Lippincott Williams and Wilkins 2009. safework/documents/policy/wcms\_107535.pdf
5. Achalu E. Occupational Health and Safety Lagos. Simarch Nigeria Limited (Splendid Publishers). 2016; 25-31.
6. Heymann D. Control of Communicable Diseases Manual, Eighteenth Edition. American Public Health Association, Washington D.C. 700 pp. [http://www.dec.ny.gov/docs/materials\\_minerals\\_pdf/GWPCMarcellus.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/GWPCMarcellus.pdf). 2016.
7. Kitunga LJ. Working women. East African newsletter on occupational health and safety, 2017, pp:28,10.
8. National Institute for Occupational Safety and Health. 2014. NIOSH Occupational Injuries and Illnesses: Industry Data. Washington, DC. Information Services & Research Department International Affairs Office
9. University of Chicago. "Environmental Health and Safety at the University of Chicago. N.p., n.d. Web. 2017.
10. Eduardodias health. "Dos and Don'ts at The Pump. Gas Station Safety Video." YouTube. YouTube, 2008.
11. Wluk.M "Gas Station Accident." YouTube. YouTube. 2016; 104-110.