ABSTRACT

Welding apprentices invest in their vocational and technical training. The welding job has numerous risk factors, including physical, chemical, and psychological. Exposure to these conditions may contribute to specific health problems and occupational hazards. Most welders learned to weld by apprenticeship, without any structured educational system in health and safety and a small number of welders is trained by trainers and certification course. Among some of the health-related problems that are led by welding work are skin burn, lung diseases, eye problems, hearing problems, heart problems, and musculoskeletal disorder. Welding work has various occupational health hazards because of the lack of using personal protective equipment. Personal protective equipment is a significant contributor to the prevention of various occupational health hazards. Physical morbidity profile of welders estimated 562000 employees are at risk for exposure to chemical and physical hazards according to Occupational Safety and Health Administration research. In 1993, the Bureau of Labor Statistics reported 58 deaths from welding and cutting accidents involving fires, electrocutions, asphyxiation, falls, and crushing injuries. Present overview of physical morbidity of welders are a low number of Publications about apprentices welding are a requirement for knowledge improving and give health promotion education to welders. 

Key Words: Certification, Hazard, Personal protective equipment, Risk factor, Training program, Welding apprentices
employees can monitor the workforce by following critical
guidance.11

Risk factors of welders according to the Conference of Gov-
ernmental Industrial Hygienists (ACGIH) and the Occupa-
tional Safety and Health Administration (OSHA).

Electrical shock
The welder faces the most frequent serious and immediate
risk cause of electrical shock. Electric shock can cause seri-
ous injury or death.12 Electrical shock occurs when welders
accidentally touch open wires or open wire connected to an
object that has a voltage between them. If the worker keeps
a raw wire in one hand, the electrical current flows through
the wire and welding machine in another hand it can lead to
death and serious problem for welders.13

Fumes and gases
It is most usual in welding practice that excessive contact
with welding gases and gasses may present a danger to
the safety of welders.12 Welding fumes contain a Seriously
damaging large amount of compounds made from metal
oxides welding material or welding process, according to
this situation OSHA given guidelines for that keep Use suf-
ficient ventilation and emissions in the work environment
to monitor toxic smoke and gasses exposure, it depends
on which material used for the welding process.14 Welding
is required adequate ventilation in the workplace to hold
gases and gasses from the respiration cycle and general en-
vironment.

Flames and fires
The welding process produces high temperatures which may
be sufficient if proper safety procedures or personal protec-
tion devices are not used.15 While the welding process may
lead temperature of 10,000 degrees Fahrenheit, but the dan-
ger is not the welding process, danger when that contact with
object and spike to explosion.16This can go as far as 300 met-
ters from the weld zone. Install fire alarm for security to pre-
vent this condition and also save human life.16

Injuries from insufficient practices and PPE
Injuries from welding are common because welding work
welders will deal with various situations and physical exer-
tion. In that major role play personal protective equipment
(PPE) for welders to keep free from welding hazards. Such
as one of the most common burn-in welding accidents, the
proper use of PPE gives the welders liberty adequate protec-
tion from welding hazards.17

Health Hazards
According to TWI welding association and research institute
and Occupational Safety and Health Administration (OSHA)
health hazards are classified.18 According to research Annu-
ally, 40-50 welders are hospitalized come to the respiratory
problems borne out by welding fumes, every year 2 of those
welders die. Annually Nine welders suffered from work-
related problems of asthma, stainless steel fumes contain
harmful chromium oxide (Cr₂O₃) and nickel oxide (NiO).
Welding fumes are highly carcinogenic to humans.

Respiratory Illness
Several studies reported that respiratory illness is more com-
mon in welders and morbidity rate also in large numbers.19

- **Pneumonia**- Welders are much more likely to be
suffering respiratory infection that can cause serious and very often deadly pneumonia. While
a new generation of modern antibiotics usually
cures rapidly the infection. Serious trigger results
in the hospitalization of 40-50 welders each year
of cases 2 being deadly.20

- **Occupational asthma**- Around Nine welders’
workers affect asthma very terribly per year. The resent
HSE research found that welding worker fumes Could not be predisposed to trigger asth-
ma. Even now HSE counseling welders safeguard
oneself and control the welding vapours to reduce
the rate of infection probable.21

- **Cancer**- The welding gases are listed worldwide
as carcinogenic to humans. But probably related
to stainless steel welding.22

- **Metal fume fever**- recent studies show the mor-
bidity of metal fume fever is 43.7% of welding
workers get an infection. In welders show symp-
toms like malaise, chills, dry cough, shortness of
breath showed after when exposure is more than
3-10 hours and its resolve in 24 to 48 hours.21

- **Irritation of throat and lungs**- Accordance to
studies of metal fume fever and respiratory symp-
toms related to welding May have been an indic-
ator for presenting signs of respiratory illness
but never for physiological disorders in welders.
Gasses or small debris in welding gases cause dry
throat and coughing.

- Temporarily reduce Pulmonary Function-Overall
normal lung volume, as well as lung peak flow,
were also affected by prolonged exposure to
welding fumes, but this effect is not long term.22

**Noise**: Apart from TIG- welding, electromagnetic welding
mostly creates a dangerous sound level.23 Hearing problem
is reported as welders are decrease hearing after exposure
to noise from welding work. 35.7% of welder suffer from
welding-related hearing problems.21
**Muscloskeletal problems:** Symptoms revealed welder’s lower back pain, muscle pain that they suffer from various serious problems.\textsuperscript{22} Musculoskeletal problems are notified 46.7% in research studies.

**Skin problems**
Welders are more prone to skin related problems, as reported symptoms of skin irritation and erythema, as shown in the research study. Skin diseases are seen in welders 74.3% is many scores of skin problems and most of the welders is suffering from a burn due to the inability of handling welding equipment.\textsuperscript{21}

**RISK ASSESSMENT**

In a research study, find out a risk analysis of welders by using an analysis of eight metals assessment of comet and micronucleus harm by ICP-MS in blood and urine and DNA. The welders were exposed in that basic features from 0.5 to 45 years.\textsuperscript{23} In a developing country, they are using the latest technologies and protective devices to prevent occupational hazards. The ninety per cent upper band cancer incidence related to exposure to hexavalent chromium and nickel was 6.03E-03 to 2.12E-02 and 7.18E-03 to 2.61E-02, respectively. The study of this scenario shows that asthma symptoms health threat in welders is much more important. Welders are at high risk of cancer.\textsuperscript{24}

Based on previous research, cancer risk estimation was calculated. It can range from 1 to over 40 years. Some instances were recorded with 36 years of experience as a welder. In certain academic reports, however, there are cases of 40 years of professional experience in welding the research-based study.\textsuperscript{25} This point can be viewed as a significant consideration in recruitment and screening tests. The asthmatic patient to have higher ventilation rate and breathing rate comparison with the normal subject.\textsuperscript{26}

The basic steps in risk assessment:\textsuperscript{27}

1. Identify the hazardous situation.
2. Consider who maybe suffer in the situation and how
3. Evaluation of risk may arise from hazards, and whether established safety precautions must be implemented and sufficient.
4. Record observations, even if they are easy to explain.
5. Review the evaluation from moment to moment and revise where required.

**PREVENTIVE MEASURES**

In other research, there was recognition of the workplace safety risks involved with welding between 77.9% and 91.6% of welders. The period prevalence of morbidity of welders according to the survey, many welders have noted an adherence to occupational health hazards and non-use of the protective equipment. Health awareness of welders and health measures or recommendations also had to be carried out at the welding site.\textsuperscript{28} Many of the preceding studies did not thoroughly assess the morbidity trend among welders. Also, past studies indicated a lack of awareness of occupational hazards and the use of safety precautions by many welders.\textsuperscript{29} Few types of research showed a high degree of concern within welders regarding occupational hazards, even so, their use of safety equipment did not affect them. It was, therefore, crucial for us to analyze the awareness and purposes for the non-use of protective equipment among the welders.\textsuperscript{30}

**DISCUSSION**

Occupation hazards among welders due to inadequate use of PPE. Most of the welders use recommended PPE to find...
by Bhumika et al. and Kumar SG et al. In welders musculoskeletal disorders occur due to poor condition of the workplace. Working in healthy body condition, using appropriate PPE under working conditions. Reduce the repetition of the same work that maybe reduce the risk of musculoskeletal disorders. Burns and electrical shock are more likely to occur among workers exposed to welding because of the accidental worker touches the welding electrode with bare hand and amount of heat as well as the pressure used in the process. Lack of safety training about occupational hazards, limited use of PPE and prolong working hours are contributing factors to the occurrence of injuries. Hence, make criteria with educational qualification during recruitment, a compulsory training course on welding, at least PPE awareness program is recommended to all employees.

CONCLUSION

Though some publications have been found also on subject and should be noted that too many studies have been carried out in developed countries, the prevalence of morbidity among the welder’s survey respondents was large. Several welders have reported ignorance of health problems associated with the profession and non-use of safety equipment. Welding initiatives are still in India, but weak welding units’ industries are declining to conform with national standards. This brings in for powerful endeavours by the concerned specialists to implement capability rule and pre-position preparing programs for welders, a specific test in a creating nation, for example, India. In any case, mandatory transitional instructional training in welding and the use of a PPE-Awareness system are required.

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Table 1: Welding Hazards

| Hazards          |
|------------------|
| 1. Fumes and gases |
| 2. Electrical shock |
| 3. Radiation      |
| 4. Noise          |
| 5. Fire and Burns |

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