

Occupational Health and Safety in Coal Mine Industry: Analyzing the Situation of Coal Mine workers in Balochistan Province



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**Occupational Health and Safety in Coal Mine Industry; Analyzing
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Submitted in partial fulfillment of the requirements for the degree of MS in Sociology at faculty
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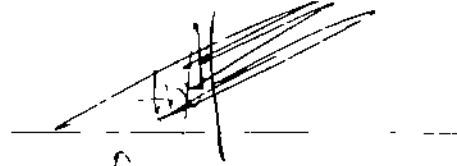
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It is certified that thesis submitted by **MR. AMINULLAH** Registration No **143-FSS/MSSOC/S13** titled "**Occupational Health and Safety in Coal Mine Industry: Analyzing the Situation of Coal Mine Workers in Balochistan province**" has been evaluated by the following viva voce committee and found that thesis has sufficient material and meets the prescribed standard for the award of degree of **MS** in the discipline of Sociology

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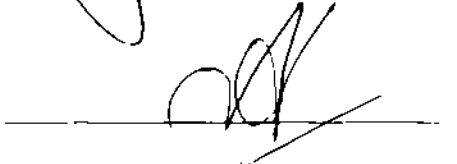
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Dedicated

To

My Brother

Nasibullah

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Abstract

The focus of this study is to explore occupational health and safety measures taken for workers working in coal mines in Baluchistan province of Pakistan. The study was conducted in three districts of Baluchistan where coal mines are operational. A sample of 400 coal mine workers was studied from Quetta, Loralai, and Harnai districts. An interview schedule composed of both open and closed ended questions was designed and used during survey for data collection. The analysis revealed lack of awareness about occupational health and safety measures, non availability of medical facilities, non provision of personal protective equipments, and poor compensation policies in case of occupational accidents. The study concluded poor management system in coal mine and non implementation of policies for better occupational health and safety in coal mine industry. The labor department needs to take measures for proper implementation of occupational health and safety measures through monitory system of reward and punishment.

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Important Abbreviations

CIWC&E	Centre for Improvement of Working Conditions and Environment
CWD	Compensating Wage Differentials
GDP	Gross Domestic Product
GSP	Geological Survey of Pakistan
ILO	International Labor Organization
MSHA	Mine Safety Health Administration
NIOSH	National Institute of Occupational Safety and Health
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Administration
QRA	Quantitative Risk Analysis
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

The health of working class is quite important for the socio-economic development of any country. The economy of any country is dependent upon the worker's health status. Like other developing countries Pakistan being an energy deficient country is mainly dependent upon imported and the coal extracted from mines located mainly in Baluchistan and Sindh provinces. The country face poor health status of workers due to different reasons like inadequate medical facilities, illiterate labor force, unavailability of training and awareness courses and health and safety committee.

Pakistan is supposed to have 186 billion tonnes of coal reserves in 2013, but is mostly of poor quality. Sindh contributes the biggest coal reserves of 185.5 billion tones, followed by Balochistan, which is considered to have 0.459 billion tonnes of coal reserves (less than 1% of Pakistan's total reserves). Despite this it contributes more than 50% to Pakistan's total coal production annually. Majority of the coal is used in brick kilns and a small amount is used as an energy source (Geological survey of Pakistan 2012). Balochistan has 6 developed coalfields all of which are located in northern part of the province. There is the Mach-Abegum coalfield found in Bolan district approximately 70 km southeast of Quetta. Sor Range- Sinjidi-Deghan coalfield is situated 28 km east of Quetta and is considered the deepest coalmine in Pakistan. Pir Ismail Ziarat-Margar-Narwar coalfield is situated 60 km east of Quetta, and the Duki-Anambar coalfield is located in Loralai District. The Khost-Sharig-Harnai coalfield is located in Sibi District about 160 km from Quetta, and the Chamalang coalfield is found in Loralai District.

Balochistan is the largest province in terms of area and smallest province in terms of its population dispersed over a large area. As Balochistan is the home for about 106 minerals as evidence reported that 80% of minerals come from Balochistan (GSP, 2012). Along with coal, natural gas, copper, gold, iron and other precious minerals, it also contains deposits of zinc, chromites, uranium, gypsum and limestone. These entire minerals require a trained and healthy labor force for exploration. Untrained workforce, and poor working conditions create multiple problems for workers involved in extraction of these precious minerals.

In coal mines frequent exposure of workers to coal dust and different work related hazards causes serious health problems. After long working hours in the adverse situation coal dust and other unhealthy factors adversely affect the worker health and may lead to the respiratory and skeletal diseases.

In Balochistan, majority of accidents occurred in mines are not reported to the Labor Department. This resulted in lack of availability of data about occupational health and safety (OHS). Diseases and accidents are dreadful tragedy in the work place. As thousands of workers are routinely exposed to hazardous coal gases (methane, carbon dioxide, oxide of nitrogen) therefore the incidence of occupational diseases and injuries are very high in Balochistan. The healthy workers are most productive and useful. The high accident rates, occupational diseases, and unhealthy working environments are the outcome of lack of awareness and poor safety measures adopted in coal mines. The workforce is illiterate and not familiar with the protective measures required to be adopted during their working hours. The workforce is not prepared to cope with the hazards posed by digging, raising and loading processes. The legislation regarding occupational health and safety is decades old and needs revision. The country lacks the basic infrastructure and qualified personal for giving occupational health and safety services.

to the labor force. Therefore, a sufficient number of workers will be at risk if no future attempts are made to improve OH&S (Pasha et al 2003)

Mining is a hazardous operation which comprises extensive safety and danger to workers. Dangerous conditions in mines lead to various accidents and resultantly adversity and harm to human lives, property, obstruction happening and so forth. In any case, the dangers can't be totally crushed and accordingly there is a need to characterize and figure out an accident danger level possible to be introduced in either quantitative or subjective way (Glendon et al 2006)

The role of awareness and education in health and safety is pivotal in the model as it is hypothesized to be directly related to risk taking behaviors thus to arbitrate the relationship between senior supervision obligation and danger taking behavior. This is projected to be an opposite association as knowledge increases, the tendency to connect in risk-taking behaviors will decrease. A direct relationship between higher-ranking administration commitment and risk taking behavior was also specified in the model so that a contrast between that connection and the mediate association could be made (Crasner 2013)

In the mining industry employees suffer from many diseases of respiratory tract infection, backache and headache. The workers inhale coal dust in the digging and raising section, through the ears, mouth and nose, causing different harmful diseases of lungs, and digestion. The coal dust disperses in the air in the digging section which affects the worker's health and they suffer from different health problems. For instance, in the digging and raising section, accidents occur because of the slippery tracks, land sliding, and toxic gasses. Often such accidents result in the permanent disability of the workers. In many coal mines the workplaces of units don't meet the required standards as described in the mining act (Horovitz,

1946)

Practically all members of the workforce are exposed to electrical energy during the performance of their daily duties. Electrical current exposes workers to a serious, extensive occupational hazard. Many workers are unaware of the potential electrical hazards present in their work environment, which makes them more exposed to the danger of electrocution. Electrocutions occur to workers in various job categories. Some health problems are caused by noise or high temperature. Noise induced hearing loss is a frequent finding among workers in noisy workplaces. Heat stress may be dangerous in it and may also predispose workers to other conditions. In hot environments it may be impossible to wear protective clothing, and consequently exposure to other hazards may occur. Under diagnosis and under reporting of occupational diseases lead to the belief that they are a minor problem. In the workplace, hazards are frequently occurred by the use of blasting chemicals, materials, tools and machinery (Campaign, 2013)

World Health Organization (WHO) contributes an idea that the workplace can be said is a premises where accidents & diseases are prevented and health is protected. Furthermore, workplace should be capable of providing a surrounding for improvement or formation of good health. Healthy workers give good output with reasonable quality, pass healthy living and raise healthy families. Healthy worker plays a vital role to overcome poverty. The safe environments of workplaces contribute to develop sustainable development in country. Therefore, it is the procedure of protecting workers, neighboring communities and the surroundings for future generations which have important general factor, such as pollution control and exposure reduction. Such processes may be influenced by occupational health and safety programs. Occupational safety and health can be helpful in improving the employability of workers with

the better workplace design, provision of a healthy and safe work environment, training and assessment of work demands, medical checkup, health screening and evaluation of practical capacities (Arigo et al 2011)

A healthy worker is essential for sustainable societal and economic development both in public and private as well as regional and local level. The traditional approach to maintain health and safety in the workplace has primarily focused on the enforcement of legislation and assessment of workplaces to ensure conformity with health and safety standards. Since the industrial revolution, this approach has been useful in overcoming many specific occupational hazards. But it has not been very successful in the past several decades, especially in developing countries due to various reasons. The enhancement of occupational safety and health in the workplaces can be fruitful in better yield, better work performance, and improved economic development (Hogstedt, 2007)

The use of chemical in mechanized and industrial processes has expanded significantly in recent years in both the industrialized and the developing countries. Immense occupational and ecological problems are faced resulting from the production, use, storage, transport, handling and disposal of chemicals. Currently, there are more than eight million known chemicals. About 100,000 chemicals enter the market every year (Lehmann, 2012)

In Pakistan there is a poor occupational health and safety legislation and infrastructure which need to be promoted. In Pakistan, there is no particular complete law which covers occupational health and safety. There are various laws related to health and safety in different sectors. Different portions of legislation deal with various aspects of occupational health and safety in Pakistan (Pasha et al 2003)

In Pakistan, the main training institution working for different aspects of occupational

health and safety is the Centre for Improvement of Working Conditions and Environment (CIWC&E) situated in Lahore. Since it became operational, CIWC&E has organized 135 training courses where over 2600 participants have been trained. These courses/seminars were held at CIWC&E as well as various other locations in the province of Punjab for managers, relevant government agencies, OH&S professionals, academic institutions, NGO's, trade unions, and other individuals concerned (Pasha, 2003).

In view of the significance of occupational health and safety measures for worker's health and improved output, there is a need to assess the OHS situation in the coal mine sector in Pakistan. The present study was designed to explore problems and the factors which are responsible for maintaining the worker's occupational health and safety in the coal mine industry. It may be helpful in formulating programs and policies to solve the problems related to the worker's health and safety. The study was limited to only three districts of Balochistan due to financial and time constraints.

1.1 Statement of the problem

There is a common consensus that Baluchistan is the backward province among other provinces of Pakistan. The majority of the workforce in Baluchistan is engaged in the mining industry. The major mining in Baluchistan is the coal mine industry, therefore a considerable portion of the workforce is employed in this industry. The purpose of this study is to explore the problems and difficulties of occupational health and safety faced by coal mine workers in Baluchistan. Multinational trade and globalization are bringing new challenges in the field of occupational health and safety. The country lacks the basic infrastructure and qualified personnel for providing better occupational health and safety facilities to the labor (Cheema, 2003). This adversely affects the worker's health and their efficiency. Workers are at risk of developing occupational diseases.

due to their employment. Thus, occupational health services have a central role in the creation of a comprehensive health care system for all workers (Heymann, 2003). There is a need to conduct an empirical study to explore the occupational health and safety conditions prevailing in coal mine industry.

1.2 Objectives of the study

1. To study the socio economic characteristics of coal mines workers.
2. To explore the available health and safety measures to the respondents
3. To study the status of occupational health and safety measures for coal mine workers
4. To identify the major causes of occupational hazards
5. To examine the relationship between OHS and working environment
6. To suggest policy measures to mitigate OHS for better health of the coal mines laborers

CHAPTER TWO

2. Review of Literature

Pakistan is home to a plenty of regular assets, traversing over a zone of 600,000 sqkms. The nation has the world's second biggest supply of salt in Khewra (Punjab) alongside noteworthy stores of coal and other mechanical and development minerals. Also, more than 50 minerals which incorporate marble, chromites, magnetite, fluorte, sulfur and bauxite, are under misuse. The present commitment of the mineral segment to the GDP is roughly 0.5%, in spite of the fact that this offer can possibly increment impressively in the light of late revelations of copper, zinc, gold (RekoDiq, Balochistan) lead and most outstandingly coal (more than 175 billion tons of stores in the deserts of Tharparkar in Sindh) (Kalam et al 2011).

Worker's interest is a vital segment in any harm counteractive action program. Ergonomists are dynamic advancing proper preparing for workers and end-client info. In any case, while business related injuries can be a genuine worry at an authoritative level, at the level of the individual representative the everyday or even yearly danger of harm can be very low. This is particularly the case with musculoskeletal issue when the injuries are regularly combined in nature. Unless the apparent harm danger is high, the yearning to maintain a strategic distance from damage may not be in number help of representative cooperation (Adams, 2011).

The part of information and preparing in safety and security is essential in the model as it is conjectured to be specifically identified with danger taking practices and in this manner to occur the relationship between senior administration responsibility and

danger taking conduct. This is proposed to be a reverse relationship as education expands, the similarity to lock in danger taking practices will reduce. An immediate relationship between senior administration duty and danger taking conduct was likewise determined in the model so that an examination between that relationship and the interceded relationship could be made (Yule et al 2006)

There are great purposes behind the mining business to be concerned about danger in mines, in both subjective and quantitative terms. Improper move procedure, excessive working hours, prolonged contamination issues, unfavorable environment and work conditions and absence of preparing can endanger underground mine workers and result in worker weakness and risk to life of the mineworkers. The subsequent extreme monetary and social outcomes incorporate diminished profitability, higher mishap and work related sickness rates, non-appearance, assent and expanded laborers' compensation. Then again, there are impressive business, monetary and mechanical relations advantages to be acknowledged from the advancement and fruitful usage of compelling danger evaluation. The degree to which representatives feel exhausted has suggestions in four regions of quick worry to bosses: security in the working environment; work execution, worker maintenance, and medical services costs. These can significantly affect a mine's execution and on the safety and security of the workforce in an amiable workplace (Jan, 2007)

The role of awareness and education in health and safety is pivotal in the model as it is hypothesized to be directly related to risk taking behaviors and thus to arbitrate the relationship between senior supervision obligation and danger taking behavior. This is projected to be an opposite association – as knowledge increases, the tendency to connect

in risk-taking behaviors will decrease. A direct relationship between higher-ranking administration commitment and risk taking behavior was also specified in the model so that a contrast between that connection and the mediate association could be made (Kester, 1991)

Security records for the mining business in India have been enhancing throughout the years. Then again, more than 1000 genuine accidents still occur each year with more than 200 fatalities. The casualty rate in the coal business has been realized around 30% in the most recent decade. As of now, it remains at 0.27 for every Mt of yield for mines. Impressive consideration is being given to enhance execution in such manner. On account of underground coal mines, rooftop falls keep on being the single biggest reason for accident, representing around half of the fatalities underground. Other than more prominent accentuation on preparing and inclusion of laborers in all security related issues, the industry needs to advance a safety society prompting characteristically safe practices (Akala, 2003).

Given the plenitude of mineral assets available to Pakistan, there has been almost no venture or any mechanical improvement to reinforce this area. The inability to advance the mining part in any organized way prompted the administration renting out destinations to trivial contractual workers, more often than not on a short-term premise. The brief length of time of the lease additionally gave minimal impetus for long haul improvement of the mines what's more, centered around transient benefit augmentation. Mines were worked by many little and medium scale mining gatherings. Subsequently, little interest in present day hardware and apparatus was made and routines stayed primitive. Besides, this heap of little mining and preparing units had no legitimate lawful,

money related, business, innovative and social backing from the legislature. Indeed, suggestions made by a nine part board on Mines and Oil Fields in 1948 expressed unequivocally that the strategy of renting little zones of coal-bearing area to trivial contractual workers ought to be stopped and the business be nationalized. The report additionally noticed the proceeded with utilization of primitive techniques and the need to uphold the utilization of advanced apparatus and gear. Today, right around 90% of mines are in the hands of private proprietors (Postel, 1994)

Under the Constitution of Pakistan, minerals, aside from uranium, oil, and characteristic gas, falls under the ambit of the common governments. Uranium, oil, and regular gas go under the purview of the government. The Central Inspectorate of Mines, a subordinate office of the Ministry of Labor, Manpower and Overseas Pakistanis, was made in 1966 to take care of matters identifying with the safety, safety and welfare of specialists occupied with governmentally controlled mines (Ladan, 2011)

The primary Indian Mines Act, went in 1901, contained procurements on safety and safety, however it was not until the Mines Act of 1923 that any limitations were forced on the job of work. The 1923 Act, contains entomb alia procurement for the prohibition of youngsters under 13-years, the award of a week by week occasion also, the constraint of week after week hours to 60 over the ground and 54 subterranean. The Act was supplemented by two involved arrangement of regulations, one identifying with coal mines and one to different mines. Moreover, principles were confined by common governments. After 1923, two essential changes were made in the law. The changing Act of 1928 gave that no mine should be open over 12 hours in 24, unless on an arrangement of movements and that moves must not surpass 12 hours and must not cover (Jay, 2012)

The diverse enactment identifying with mines enables the elected and common governments to make regulations for accommodating the safety of persons utilized in mines, their method for passageway and way out, the quantity of shaft out-lets to be outfitted, the fencing of shafts, pits, outlets and pathways, safety of streets and work put, the ventilation of mines and the move to be made in admiration of dust and gasses, and the regulation of the utilization of all hardware (Bonesteel, 2008)

Pakistan is accepted to have 186 billion tons of coal stores starting 2013, yet is generally of low quality Sindh has the biggest coal stores of 185.5 billion tones, trailed by Balochistan, which is accepted to have 0.459 billion tons of coal stores (under 1% of Pakistan's aggregate stores) Regardless of this it contributes more than half to Pakistan's aggregate coal generation every year Most of the coal is utilized as a part of block furnaces and a little sum is utilized as a vitality source Balochistan has 6 created coalfields all of which are situated in northern area There is the Mach Abegum coalfield found in Bolan area roughly 70 km southeast of Quetta Sor Range-Sinjidi-Deghan coalfield is situated 28 km east of Quetta and is viewed as the most profound coalmine in Pakistan Pir Ismail Ziarat-Margar-Narwar coalfield is situated 60 km east of Quetta, and the Duki-Anambar coalfield is situated in Loralai District The Khost-Sharig-Harnai coalfield is situated in Sibi District around 160 km from Quetta, and the Chamalang coalfield is found in Loralai District (Council 2013)

For the business, this audit demonstrated that youthful laborers particularly young fellows were a higher danger gathering for work related injuries Then again, the injuries of youthful laborers were less frequently deadly than those of more established laborers,

in light of the fact that youthful specialists opposed effects superior to more established laborers (Salminen, 2004)

Measurement of accident in our mines demonstrates that however there has been a slow fall in death rate per thousand persons utilized in mines, it is a matter of extraordinary worry that the pattern had remained enduring throughout the previous two decades or somewhere in the vicinity Cause-wise investigation of these mischances likewise uncovers that a couple known reason gatherings have been the real benefactors There is a need to accomplish something more than conventional measures to make an achievement of this pattern (Florence, 2013)

Mining is a hazardous operation and comprises extensive, safety and danger to workers Dangerous conditions in mines lead to various mischance and reason adversity and harm to human lives, harm to property, interference happening and so forth In any case, the dangers can't be totally pulverized and accordingly there is a need to characterize and figure with a accident danger level conceivable to be introduced in either quantitative or subjective way (Verma et al 2013)

Safety is vital in the mining environment. The digging business has for a long time concentrated on damage avoidance at the working environment through methodology and preparing, and has made impressive progress In any case, the measurements on real accident occasions, for example, fatalities and reportable occurrences has not demonstrated the comparing levels of change In the range of real risks control, the mining business methodology has underlined principally on past encounters and lessons learnt, while other high danger commercial enterprises, for

example, the compound procedure industry and oil and gas industry have taken framework safety strategies to new heights (Bahr, 2014)

Hazard evaluation and examination, prompting risk administration plans ought to shape an indispensable piece of mining at all stages from wanting to execution Hazard administration is a consistent procedure including distinguishing proof of perils, creating and recognizing controls and checking the adequacy of mining and safety related strategies With such frameworks set up it ought to be conceivable to further cut down the mischance rate, which is still high contrasted with a percentage of the propelled mining nations Further to place conducting so as to learn into practice field work in a close-by mine, by method for concentrating all the conceivable reasons for danger, accident rates, and sorts of mischance (Caffery et al 2010)

Counteractive action of human and property misfortunes is necessary to the operation and administration of Mining procedures. This may be accomplished through the choice of an innovation that is inalienably sheltered Then again safety of configuration and/or operation can be reviewed by the use of danger recognizable proof and hazard examination strategies, and receiving measures proposed by the investigation The last approach constitutes Quantitative Risk Analysis (QRA) This area depicts particular strategies that can help in accomplishing such destinations The general approach introduced in this code permits orderly distinguishing proof of dangers and evaluation of the dangers connected with the operation of procedures Connected with the due aptitude and thoroughness the endorsed procedure can offer the client some assistance with understanding the relative levels of dangers and danger potential in an establishment This guides the determination and prioritization of essential procedures for

mischance counteractive action and constraining their results Hence, the code can be utilized for enhancing plant security execution and additionally to decrease human and property misfortunes (Wallace, 1995)

Ventilation framework has natural controls identifying with the control of flame dangers These incorporate procurement of different getaway courses and isolation of transport streets from parallel admission aviation routes in light of a legitimate concern for aversion of spreading results of burning from a transport fire. The ventilation framework can be utilized to control a fire or the consequences of a fire For instance, results of burning can be kept from being spread by method for ventilation changes The effect of flame on the ventilation framework must be considered. Where flame exists, harm to ventilation gadgets could compound the impacts of a flame by method for giving access by results of ignition to populated ranges. No ventilation framework change would be allowed aside from with the express power of the Incident Management Team The effect of the ventilation framework ablaze and the methods by which the danger of flame harming ventilation 65 framework segments controlled are secured by the Spontaneous Combustion and Ventilation Management Plan (Brnich et al 2000)

Hazard administration must be seen as an instrument for improvement of proper health and safety administration frameworks. Each mining organization ought to recognize one or more mines and ought to attempt a formal danger evaluation procedure went for diminishing the probability and effect of setbacks of various sorts in mines In this manner danger appraisal procedure ought to be stretched out to different mines Hazard evaluation procedure ought to go for powerful administration of dangers, by recognizing Which dangers are most needing diminishment, and the choices for

accomplishing that hazard decrease and which dangers need cautious on-going administration, and the way of the non going consideration. The danger evaluation activity ought to take after a fitting procedure. Hazard administration arrangements ought to be arranged on the premise of danger appraisal and executed in the distinguished mines. Indian mines are not utilizing danger evaluation methods as the procedure of mining is under the control of a select association where cash making is more vital than safety measures. For such mines, hazard evaluation must be made compulsory (Kumar, 2010)

It was seen amid the investigation of the undertaking that the current state of mine environment and safety danger' is at a low. It was found that mine danger appraisal methods and executions are more mainstream in the created countries like Australia, USA, Canada, European nations and so on and are yet to pick up a positive and exact decent footing in the Indian mining situation. Some Indian mines are utilizing danger appraisal strategies although much work must be done as far as fruitful application and identifiable results. In the visit to the Disaster Management Institute, we learnt that these organizations haven't embraced mine danger evaluation as a result of the challenges confronted in measuring different dangers connected with mining industry. These dangers can be evaluated, however require particular arrangement and usage by the hands of gifted architects. Demonstrating strategies are accessible and projects can be made to sufficiently be enough the absentee coming of Risk Assessment Modeling in the Indian mining industry. Since we were low on assets and capacity, we lacked the capacity to evaluate and anticipate the different issues like Mine Fires, flood, Roof Fall and so forth, however we have utilized the most fundamental elements for Mine Fire and made the

projects. The projects can be effectively expanded in degree and measure with the expansion of other essential components. It is likewise vital to remember measurements and authentic episodes while outlining these projects in order to guarantee that history shouldn't repeat it (Evans et al 2002)

Ilmarinen (1997) depicted that the mean period of work power in numerous European was expanding, with the outcome issues brought on by maturing of workforce. Exercises to keep up laborers' capacity to work have turned into a need in OH&S. Work capacity may be considered to incorporate physical safety, psychosocial prosperity and expert fitness of people, additionally a fitting workplace and work associations which enhance the execution of the people at work.

High damage rates have a tendency to happen in lower financial gatherings whose view of causation and work experience place them inconsistent with administration. In the meantime injuries are dealt with, researched and repaid at an individual. Further, examples of conduct, injuries and plain clash may be identified with the levels of control experienced at work. A contextual analysis results exhibited that an irreconcilable situation was perceived by both specialists and administration and brought about unsaid acknowledgment of 'prohibitive work hones', as survival components (Claire, 1987)

Linster (1994) directed his examination on the administration and motivational reasons in the control bellow of prompted listening to misfortune. In this study, the scientist connected these components to the benchmarks of listening to preservation, achieved in industry as showed by consistence with the Noise at Work Regulations. The exploration comprised a study of 48 associations crosswise over Britain, and a more finish examination, ten of these as contextual investigations. A helpful listening to

security system requires three administration qualities a) authority from senior administration, b) the capacity of center administration (essentially underway and designing) to put listening to protection measures into practice, and c) master specialized information of disorder and about the performance. The study finishes up to the requirement for further training and inspiration of senior supervisors as the primary worry in enhancing guidelines of listening to preservation and commotion control.

Wilkins et al (1982) gave proof through their exploration to an attainable relationship among accidents and upheaval in industry. It had as often as possible been declared that upheaval can be the wellspring of accident. Yet, just five studies have endeavored to audit the level of this issue. These examination studies had pointed out that high commotion levels might potentially be connected with higher mishap rates and in this way give characteristic however not last truths that clamor is a contributory reason in the causation of accidents. The conceivable frameworks of such a result contain the part of clamor in bringing about an absence of interest and the veiling of fundamental listening to flags pretty much as notice yells, sirens and hardware commotion which call attention to future perils. Also the reason for a commotion impelled listening to misfortune and the need to put on uncommon listening to security to react the clamor couldn't contribute specifically to accidents by meddling with sound-related correspondences. It is reasoned that the likely association among commotion and mechanical accident, further highlights the significance for decreasing clamor in industry and it ought to be achieved wherever conceivable by method for clamor control.

Richard, et al (1996) explored that the real reason for weakness and handicap is the injuries at work environment in Queensland. For the time of 1996-97 there were

36449 repaid at working environment, with 644,471 workdays missing of these injuries 2.622 or 7.2% were delegated genuine. It was assessed every year to be between \$15-37 billion yearly. The injuries at work spot were not just acquiring significant costs to safety administrations in Australia however they to make up a broad part of work expense through work pay premiums. This cost has been evaluated to be more than 8% of work expenses other than costs for time worked.

Moazzam, (2000) portrayed that the harm advantages are paid to secure a laborer. Why should incapable go to his obligation because of work damage at the rate of 100% of his wages to a greatest of 180 days. Disablement tip is paid to a secured specialist who has gotten a vocation damage and his level of disablement has been evaluated up to 20%.

Strasser, (2003) clarified in the ecological safety and security administration and examining projects that various principles and regulations serve as a premise for both word related safety and security software engineers and for reviewing system. Case in point, Occupational Safety and Health Administration (OSHA) is one wellspring of US work environment principles. Different nations had benchmarks and regulations like OSHA's models. Numerous organizations had their own interior safety and security models that augment past government norms and rules.

Ellis (2002) clarified in his examination paper on the testing universe of work and suggestions for work investigators. The social and political desire at work has changed essentially. The specialists are currently less tolerant as for their working conditions which have coordinated to an increment in the measurements of objection and a huge weight on the work inspectorates which has prompted more examinations at the work environment and for more discipline of people and undertakings which don't conform to

the tenets and regulations. There are distinctive elements, which specifically or in a roundabout way make impact on OHS Specialist (work) training, age, wage, mindfulness, information, individual or physical safety, harm and sickness advantages, environment safety and security administration framework and emotional review and investigation framework. These components were examined in Turkey, India and United States, which were firmly influencing the OHS in Pakistan material industry.

Pneumoconiosis, otherwise called Black Lung Disease, is a work related lung illness brought on by breathing in coal dust. There are two sorts of pneumoconiosis straightforward, known as coal specialists' pneumoconiosis (CWP) and confounded, known as dynamic gigantic fibrosis (PMF). Pneumoconiosis is a kind of interstitial lung sickness. In this kind of illness the lung is harmed (for this situation, by coal tidy), the dividers of the air sacs are aroused, and the lung solidifies from scarring of the tissue between the air sacs (Yucesoy et al 2002).

Individuals who work in occupations where they are exposed to coal dust get pneumoconiosis. This incorporates working in a coal mine or stacking coal for capacity, working in a graphite mine or plant, and assembling carbon terminals and carbon dark. Carbon terminals are utilized as a part of some substantial heaters, and carbon dark is utilized as a part of tires and other elastic merchandise, and in addition numerous different items (Corn, 1981).

Individuals who breathe in coal dust might not have any side effects for a long time. After some time, on the other hand, as the coal dust has settled somewhere down in the lung, it inevitably causes the lung to solidify. As the lung solidifies, breathing turns out to be more troublesome and deteriorates over time (Schrotter, 1907).

Pneumoconiosis is not treatable or reparable. How serious every individual's illness gets to be is the consequence of the states of his or her work amid introduction to coal dust (Campbell et al 1998)

The Occupational Safety and Health Administration (OSHA) (a portion of the U.S. Division of Labor) sets norms for specialists. Those measures incorporate defensive necessities for any individual who works around coal, graphite, or man-made carbon. Specialists ought to wear a veil to counteract pneumoconiosis and take after other individual security systems. Furthermore, organizations are required by law to authorize greatest dust levels that encompass laborers. On the off chance that you are presented to coal dust take after these systems to ensure yourself. On the off chance that coal dust contacts the skin, laborers ought to wash the influenced regions with cleanser and water. On the off chance that your attire is polluted with coal dust, evacuate it promptly. Your manager ought to have a spot and a framework for the sheltered expulsion of the dust from your attire. Individuals who wash the garments ought to likewise think about the risks of coal tidy with the goal that they can secure themselves (Viscusi, 1984)

In the middle of the previous three decades, the coal business has encountered significant cycles which have significantly influenced the structure of its work power. Taking after extreme reductions in occupations somewhere around 1950 and 1965, business settled somewhere around 1965 and 1969, and afterward extended consistently for the following 10 years. With the extension, the industry's work power has ended up more youthful and has more years of training. Coal mining stays a standout amongst the most risky occupations in the United States, in spite of the fact that State and Federal

enactment give some insurance. Yet mining organizations report no deficiency of occupation candidates, and excavators report a high occurrence of employment fulfillment, frequently recognizing "great pay" as a huge variable (Spulber, 1989)

Coal mining is an exceptionally motorized operation, utilizing confounding, substantial gear to give safe access to the coal creases, to expel the coal from the creases, and afterward to load and transport the coal to an arrangement plant for handling before shipment. The occupations or employment assignments of coal mine generation specialists are correspondingly different, going from worker and other passage level occupations, to talented mechanics and circuit testers, and to mindful agent employments, for example, constant mining machine administrators, rooftop bolters, and administrators of coal-stacking scoop gear and draglines. As of not long ago, underground coal mines had represented the significant offer of all U S coal creation and on account of higher normal unit work prerequisites, for a significantly bigger offer of aggregate coal mining livelihood. Notwithstanding the sharp surge in surface mining subsequent to the 1960's, underground excavators still represented around three-fifths of the business' vocation in 1978. The underground mining environment is characteristically unfortunate, hazardous, and difficult (Wool, 1981)

A main consideration which encouraged enrollment of new contestants to coal mining has been the high wage structure of the business. Normal hourly profit of generation specialists in coal mining have been among the most surprising of every single mechanical laborer, surpassing the normal for all assembling commercial ventures by 55 percent in 1978. Besides, in perspective of the broad open door for extra time work or for work on weekends or occasions at premium rates, the distinction in full time yearly

income has been significantly more prominent than recommended by these correlations. An immediate measure of the profit motivating force connected with exchange to a coal comparing so as to mine occupation is given the former income of specialists who entered coal mining somewhere around 1973 and 1975 with those of laborers who were utilized in coal mining in both of these years (Wool, 1981)

Expanding competition has prompted critical change in a larger part of organizations in the industrialized world, empowering endeavors to lessen expenses and expand productivity. This has changed examples of job, especially towards a more prominent utilization of agreement, easygoing and low maintenance work and other non-standard job structures. Equivalent with these authoritative changes is the need to comprehend their effect on the soundness of the individual and the crew. Keeping up the soundness of the workforce falls under obligation of consideration enactment and produces critical expenses in the coal mining industry. It has been proposed that the business has underscored security and that inside of the work related safety and security area, the safety segment has been fairly ignored. This would seem, by all accounts, to be especially significant while considering preventive parts of safety, where organizations have attempted to recognize the most suitable techniques to keep up and improve the wellness levels of coal mine workers (Lundberg et al 2010)

Generally, wellness for responsibility has been portrayed as "the location of medical issues that may trade off individual, collaborator, and/or open security" (Kales et al 1998). This perspective of work capacity concentrates singularly on the distinguishing proof of previous medicinal conditions and the resultant danger of damage. Mining and some different dangerous commercial enterprises have reacted to enactment and

expanded attention to chances by likewise testing representatives for medication and liquor inebriation, and in a few cases, inordinate weakness. Along these lines, if a specialist is found not to have either restorative issues or disabilities identified with medications, liquor or weariness, he or she is considered 'fit for work' certainly expanding the idea of wellness for work past the nonappearance of sickness or damage (Parker et al. 2004)

A particular test in characterizing wellness for work in mining is that the real physical wellness necessities of numerous work-errands have been under-underscored as of late. This reflects clashing theories and in addition major auxiliary change. Verifiably, it has dependably been acknowledged that underground mining work forces substantial physical requests on excavators, and that not all are suited to this work. Motorization as a rule, and open-cut strategies particularly, have lessened numerous physical requests, yet in a conflicting way. Some manual assignments have vanished totally, however automation has itself made new physical requests, particularly in support, moving and set-up of gear. The lawful and philosophical foundation has likewise changed, with equivalent job opportunity enactment prompting the assumption that most work ought to be interested in the vast majority, and that special cases must be legitimately advocated. At long last, these progressions have happened against a foundation in which physical movement and wellness levels have apparently declined, and levels of overweight and heftiness have obviously expanded (Parker et al 2004)

The specialists' parts at a mine site are to a great degree shifted and work particular. However, numerous positions still include a lot of physical work with assignments including quality, versatility, strong perseverance. Since work force is by

and large discontinuous, this raises concern as for musculoskeletal harm following numerous may be caught off guard for high force stacking which may surpass their physical limit. Sprain and strain injuries remain the most regular injuries managed at coal mines in Queensland. While some of these injuries are the immediate consequence of injury, others may be credited to aggregate harm from rehashed minor damage. Delicate tissue structures of the joints are powerless to micro damage which, if unnecessary, may prompt abuse harm. This happens when the harm surpasses the repair limit of the tissue and the issue may be intensified with expanding age as the potential for repair diminishes (Worringham, 2004)

Physical quality and stamina are important to counteract intense and abuse musculoskeletal damage. The incorporation of quality, high-impact wellness and adaptability are fundamental in any workout schedule for specialists with physically requesting employments, to diminish the rate of, recovery from, musculoskeletal injuries, for example, sprains and strains (Shepherd, 1999)

Sallis et al (1998) said that it is not just those employments requiring particular physical wellness that need to guarantee a level of wellness. Principally stationary errands, for example, truck or dozer driver, require suitable wellness to neutralize the antagonistic safety impacts of these generally stationary occupations which incorporate, however presentation to vibration. These injuries for the most part show up after a more drawn out timeframe. At the point when representatives in these positions need to perform physical assignments rarely, then they are at expanded danger of over-burdening the musculoskeletal structures included in manual taking care of and power effort.

It is seen that the demise rate in Turkey in the consequence of the work related accident in hard coal creation was 6 times greater than China and 360 times greater than the USA. Passing rates to be this much high in Turkey, which has just 0.3% of the world hard coal stores, demonstrates that the work related accident emerges from lacking equipment and deficient work security, instead of extreme creation. Also, the laborers in coalmine go down the ground each day despairingly by knowing this and keep working with no certainty (Uysal et al 2015)

The International Labor Organization (ILO) gauges the yearly number of business related fatalities that happen around the world. Among the figures distributed by the ILO are assessments of the quantity of business related fatalities in South Africa. As indicated by the ILO 1908 specialists altogether kicked the bucket in business related mischances in 200. Around the same time, 288 laborers kicked the bucket in mine accident. Given that diggers represent less than 500000 specialists (under 4% of the aggregate workforce) in the national workforce which is about 14 million solid, disproportionate rate of business related fatalities (approximately 15%) are connected with mining (Pearson, 2009)

Open framework associations are influenced by the adjustments in exterior of life. In the consequence of this reaction, emerging from interior and outside elements, hierarchical changes of the general population in the association are outright. Maybe than the outside variables, changes in the association cause more dynamic changes on people that shape the hierarchical structure. Elements, for example, working spots, behavior and conditions of the specialists influence these progressions experienced in the association in distinctive levels. Particularly the reaction likelihood is high for the workers that work in

coal mining, a region where physical force is utilized strongly, execution criteria are high and authoritative atmosphere is declined. Actually, the forced impacts make variances in the burnout and responsibility levels of the representatives, so they cause diminishes in execution that are debilitating for the execution approaches in coal mining. One of the main roles of operations is enhancing so as to get more productivity from representatives, their abilities and expanding their hierarchical duty. Influenced by the variables, for example, decency, fulfillment, professional stability, hierarchical correspondence, specialist engagement and dependence to representatives inside of the operation, the authoritative duty is likewise impacted by the elements, for example, self determination, support from workfellows and director/real, advancement, regarding by society, work related danger, routine and anxiety (Kesim, 2015)

Injuries in using so as to mine accident in Spain evaluated the occurrence rate of mishances of coal mining, petroleum and non-lively minerals. Laborers in the coal mines had the biggest number of fatalities amid 2000, 2007, 2008 and 2009, coming to in year 2000 an aggregate of 17 accident, having a frequency rate of 73.91 for every 100,000 specialists. For every other year higher rates were recorded for specialists of the non-enthusiastic mineral extraction, which 2003 had the greatest of 20 deadly accidents with an occurrence rate of 52.22. Oil extraction was the main movement in which for seven sequential years there have been no fatalities and the most noteworthy frequency rate occurred in 2006, with 2 passing's, which spoke to a record of 20.83, despite the fact that this segment has represented 8 to 13% of the aggregate workforce of the mining part. These information propose that there is a high level of work related safety in this action. Correspondingly, laborers of the coal mining sub segment, in examination with alternate

branches of mining, had a higher rate of deadly injuries for work related accident amid the 11 years investigated, topping in 2008 with 581 accidents. In the oil and non-vitality minerals, injuries from accidents are altogether lower than in coal mining (Blanch, 2014)

The mischance and sick safety record of the mining segment thinks about inadequately to that of other financial parts, for example, assembling, development and rail, prompting mining's notoriety for being the most perilous modern division. Mine surroundings are particularly testing in light of the fact that they can debase reasonably quickly and they change as mining advances. Clean and clamor are intrinsically connected with rock breaking, and in underground mines, air and light must be supplied misleadingly. Impacting, and additionally mining itself, discharges unsafe gasses into the underground environment. Ergonomic perils are normal in mining as diggers by and large handle substantial hardware and do overwhelming work, frequently in cramped conditions. In a few cases ergonomic dangers, which are connected with poor building outline, add to expanded dangers (Walters et al. 2013)

Ponders on South African underground mines demonstrate that individual dust control measures can accomplish decreases of between 25 to half of respirable dust. A scope of control measures that demonstrated together to diminish presentation dangers is hence vital. These could incorporate strategies for reducing so as to minimize dust levels, dust area and techniques for weakening, concealment, catch, and control. Current rules on tending to airborne poisons underscore the significance of distinguishing and portraying all wellsprings of airborne dust, both essential and optional, and appropriately incorporating control intercessions into strategies for picking and looking after hardware, and into the everyday work cycle. While huge instabilities stay in controlling dust

exposures and keeping up the viability of controls, the utilization of suitable individual defensive gear (PPE) is essential (Hermanus, 2007)

In the period 1973 to 1993 the Mineral Bureau for Occupational Disease ensured 128575 instances of work related lung infection. The real quantities of instances of illness is known not higher, since dark laborers who will probably have been presented to elevated amounts of respirable dust, were not qualified for advantage examinations before. Today, work related infection is still unrealistic to be analyzed among previous diggers served by asset strapped centers in country regions. Data accessible on introduction to airborne safety dangers proposes that, contingent upon the item under thought, somewhere around 9 and 50 for each penny of uncovered laborers, who represent about portion of the workforce, are overexposed to airborne contaminations (Steen, 1997)

TH-16699

The Presence of Methane, Carbon monoxide and Oxygen was measured in chosen coal mine fields of Balochistan and the outcomes demonstrated that gas introduction cutoff points are more than as far as possible given by safety security offices like National Institute of Occupational Safety and Health (NIOSH) and Mine Safety Health Administration (MSHA) USA. The base passable oxygen in underground coal mines according to worldwide guidelines is 18% while it was 14% in Balochistan's coal mines. Reasonable carbon monoxide levels are 30-33 ppm/hour while, watched levels were 35-37 ppm/hour, also methane ought to be 1-10 m³/ton amid mining with a most extreme level of 3.5 m³/ton amid post mining stage. However, these qualities were 12 and 5.5 separately. The safety issues because of introduction to these gasses included migraine in 93%, laziness or wooziness in 92%, tiredness in 91%, respiratory issues in 88%.

shortness of breath, in 87%, mid-section torment in 75%, uneasiness/stress in 66% and hypertension in 9% cases. Study demonstrates higher grouping of methane and Carbon monoxide gasses, coal tidy and coal particles in our surroundings which are bringing on safety risks in the coal excavators. Methane responds with air and uproots oxygen bringing about suffocation and sudden passing happens because of debilitating of cardiovascular sensitizers. In a few cases because of oxygen hardship, harm jumps out at some or all organs including the sensory system and the cerebrum thus creating migraines, unsteadiness, laziness, obviousness, sickness, spewing, and shortness of breath and early maturing. Tissues having exceedingly dynamic oxygen digestion system, for example, heart, cerebrum, liver, kidney furthermore, muscle are especially touchy to CO harming prompting quick demise (Azad, 2015).

Murray (1970) said that your danger of getting coal laborer's pneumoconiosis relies upon to what extent you have been around coal dust. A great many people with this infection are more established than 50. Smoking does not build your danger of adding to this sickness, but rather it may have an extra hurtful impact on the lungs. If coal specialist's pneumoconiosis happens with rheumatoid joint pain, it is called caplan disorder.

Silicosis is a sort of pneumoconiosis brought on by breathing in irrespirable crystalline silica. Quartz is a kind of crystalline silica that causes silicosis in coal mineworkers on the grounds that it is a noteworthy part of rocks. Silicosis causes x-beam changes like CWP, and it is particularly found in coal mineworkers who should uncover rock dust, for example, rooftop bolters in underground mines and drillers in surface mines (Ross et al 2004).

Coal workers were exposed to substantial manual work among coal mining like stacking and uploading, in this way musculo-skeletal safety issues demonstrated high frequency of 60-75% and these discoveries were upheld by Wearner and Greenberg. The major musculoskeletal issues reported by coal mineworkers were body hurts, knee joint, upper appendages/shoulder torment, spinal pain, and lower appendages torment as were already contemplated by (Ishtiaq et al 2014)

1.4 Theoretical framework

1.4.1 Compensating Wage Differentials (CWDs) Adam Smith (1776)

The theory of Compensating Wage Differentials, recognized in the effort of Adam Smith's (1776) *Wealth of Nations* (book). It has been contended to constitute "the crucial long-run market equilibrium developed" of labor financial aspects (Rosen, 1986). This indicates that the presence of business sector powers guarantees the installment of compensation premiums by firms which are portrayed by ordinary working conditions, as a method for enrolling and holding profitable labor. It further states that in an exceptionally aggressive labor market an equilibrium wage appropriation must emerge whereby "coordinating" of the inclinations of specialists and firms happens. Along these lines, risk-disinclined laborers will take up occupations in firms which give a more secure workplace, while less risk-opposed specialists will be all the more ready to be utilized in employments in which the negligible expense of safety procurement is dearer. Such a self-assured coordinating technique predicts that employments described by a higher risk of injuries or diseases must be in balance, offer remunerating rents, offered far beyond the business sector premium rate of pay. Business sector powers will consequently guarantee that CWDs will raise the expense of non-OSH procurement to

firms, furnishing them with an inborn motivating force to give a satisfactory level of safety to their valuable labor force

Theory propose that:

- Labor market is not characterized by a single wage (workers differ and job differ)
- Job characteristic influence labor market
- Compensating wage differentials come up to compensate workers for nonwage of the job

(How 'safe' or 'risky' a job is) If a job is unsafe the firm or employer must probably offer higher wage to attract worker and vice versa

A main consideration which encouraged enrollment of new contestants to coal mining has been the high wage structure of the business. Normal hourly profit of generation specialists in coal mining have been among the most surprising of every single mechanical laborer, surpassing the normal for all assembling commercial ventures by 55 percent in 1978. Besides, in perspective of the broad open door for extra time work or for work on weekends or occasions at premium rates, the distinction in full time yearly income has been significantly more prominent than recommended by these correlations. An immediate measure of the profit motivating force connected with exchange to a coal comparing so as to mine occupation is given the former income of specialists who entered coal mining somewhere around 1973 and 1975 with those of laborers who were utilized in coal mining in both of these years (Wool, 1981)

1.4.2 Theory of alienation: Karl Marx (1818)

Karl Marks basically offered a theory of alienation rooted in social structure. According to Marx, the social structure acts as a break down of the natural interconnections which characterize the human nature in an ideal sense. Here is the two class system in which the capitalists (employers) employ the workers and own the means of production as well as the ultimate product. In order to survive and to have access to tools and nature, the workers are forced to sell their labor time to employer. Although the workers then use the tools and apply them to nature in order to manufacture product, the natural interrelationships are shattered. Marx takes a social psychological approach here. (George Ritzer, 1996)

1.4.2.1 Alienation of workers from their productive activity

The workers do not work for themselves in capitalist society in order to fulfill their own needs, instead they work for capitalist who pay them a subsistence wage in return for the right to use the workers in any way they feel fit.

1.4.2.2 Alienation of workers from product

The workers are alienated not from their productive activity, but also from the object of those activities, the product. The product they produce by using their labor does not belong to workers in order to satisfy their needs, it belongs to the capitalists (investors) who may need it in any way they wish.

1.4.2.3 Alienation of workers from fellow worker

People basically need and want to work cooperatively in order to appropriate from nature what they require to survive. But in capitalism this cooperation is disrupted and people are forced to work side by side, and the situation is not end here. The workers in a production process usually push towards competition and even to conflict by giving them few extra awards in order to extract maximum productivity and to prevent the development of cooperative relationship. In this way considerable hostility is generated towards their peers or bosses.

1.4.2.4 Alienation of workers from their human potentials

Finally and more generally workers in such societies are alienated from their own human potentials. Workers perform less and less like human beings as they are reduced in their work to animals. They are being used as machines and animals, this ultimately destroyed the relation of workers with other human beings and with nature. The result is a mass of people who are unable to express their essential human qualities, a mass of alienated workers.

2.1 CONCEPTUAL FRAMEWORK

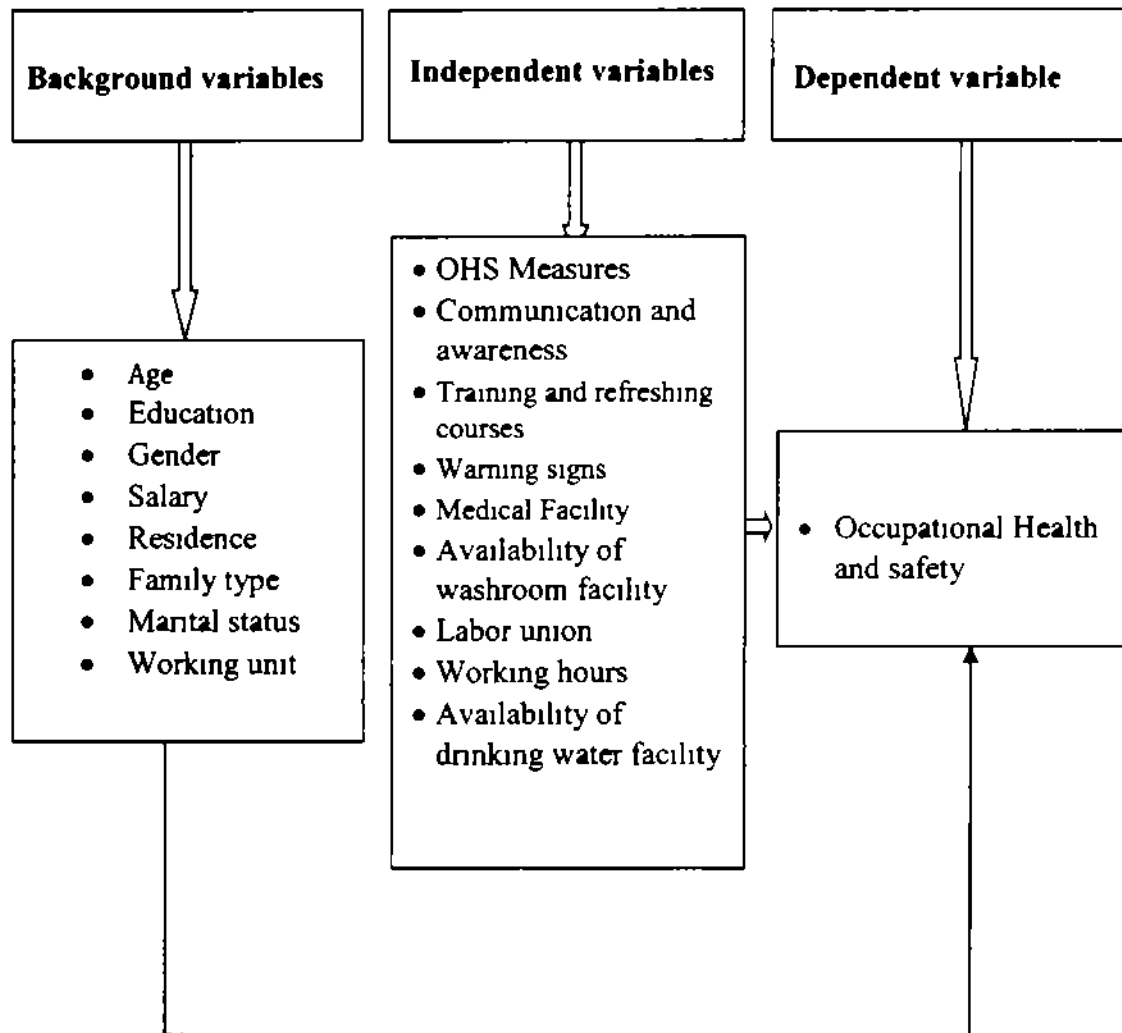


Figure 2 | Conceptual framework of the study

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Methodology

Methodology is a plan of principles, guidelines and techniques that guide exploratory examinations. Research methodology offers principles to assemble affirmations and truths about the issue, for elucidating why it happens, and for doing so in such a way that distinctive investigations can check the revelations. It is appreciated that exploratory authenticity is concentrated around the sufficiency of the rationality. The inspiration driving the method is to depict and illuminate investigation arrangements and techniques of the study. The present study was constructed both concerning vital and helper data. The key data was accumulated through the field survey. The survey was conducted in three districts of Baluchistan namely, Quetta, Loralai and Harnai.

Total sample size of three hundred and ninety six (396) respondents was selected from three districts of Baluchistan namely Quetta, Duki and Harnai having sample of 124, 188 and 83 respectively. The selected sample was drawn from the total population of 15750, 23750 and 10500 from each district. Any coal mine employed 20 or more workers was included in the list to draw the study sample. The category of the laborers includes digging, raising and loading sections. Proportionate random sampling technique was used to draw the sample from the total population of three districts. An interview schedule consisting of both open and close ended questions was constructed. After the collection of data it was analyzed through the use of Statistical Package for Social Sciences (SPSS).

Statistical tests were also applied to examine the strength of the relationship between independent and dependent variables.

3.2 Quantitative research approach

Quantitative research is 'Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods. There are two ways to test or analyze data, Descriptive and Inferential. Descriptive statistics means statistically accumulating, describing and presenting the data in univariate form, like frequency distribution, mean, mode and median. While the inferential statistics means statistically analyzing the hypothesis in bivariate and multi variate manners.

3.3 Research design

The function of a research design is to ensure that the evidence obtained enables you to effectively address the research problem logically and as unambiguously as possible. In social sciences research, obtaining information relevant to the research problem generally entails specifying the type of evidence needed to test a theory, to evaluate a program, or to accurately describe and assess meaning related to an observable phenomenon. Quantitative research design was utilized by the researcher for the present study, aimed to have a thorough concept of the topic. The interview schedule was constructed after a vast literature review about the health and safety status of mining laborers generally and coal mining laborers specially.

3.4 Universe of the study

Selection of universe is very important step in research study. It provides more accuracy and precision to the study. In statistical sense the term "Universe" means the aggregate of persons and objects under study. Universe is theoretical and hypothetical aggregation of all elements as defined for a given research (Babbie, 2001). In methodological language the universe is "The place where relevant data is collected". Universe for the present study is three districts of Balochistan namely, Quetta, Loralai and Harnai, where main economic activity is mining. Balochistan is the home for different minerals like gas, oil, gold, chromites, marble, fluoride and coal.

3.5 Population of the study

The term population means the total quantity of things or cases with the feature that a researcher desire to draw sample for the study. Population for the said study was the labors of coal mines of three districts of Balochistan.

3.6 Sample of the study

A sample is a finite part of statistical population whose properties are studied to gain information about the whole, while dealing with people. It can be a set of respondents (people) selected from a large population for the purpose of survey.

Sample for the said study was the laborers working in coal mining in Balochistan. Total sample for the said study was 400, comprising 125, 190, and 84 from Quetta, Loralai, and Harnai districts respectively. The aim of this study was to explore the health and safety

status of coal mine laborers in Balochistan The researcher selected the sample from the districts through TARO YAMMNEE formula

Mines	Districts			Total
	Loralai	Harnai	Quetta	
No of mines	950	420	630	2000
Average Laborers	$950 \times 25 = 23750$	$420 \times 25 = 10500$	$630 \times 25 = 15750$	50000

Table 3 1 Number of mines of each district and the average number of laborers

The sample size was drawn from the population of the study Population of the study from three districts was two thousands mines, separately 950, 420 and 630 from Loralai, Harnai and Quetta respectively The researcher collected data from those mines of each category where more than twenty laborers were working. The average number of laborers calculated by the minimum and maximum range of laborers working in each mine was twenty five laborers, therefore the population of the study consisted of fifty thousand The sample size was then drawn from the population of fifty thousand laborers by using Taro Yamani formula

According to Taro Yamnee Formula the Sample Size was as fallows,

$$\text{Formula } n = \frac{N}{1 + Ne^2}$$

Where (Population size) $N = 50000$,

(sampling error) $e = 05$ and

(sample size) $n = 396$

3.7 Sampling frame

It is a complete set of units from which a researcher selects a sample size with the help of various techniques. Sampling frame for the said study was Coal mining areas of three districts of Balochistan.

3.8 Sampling procedure

The procedure through which a researcher selects the sample size and gathers data from that sample is sampling procedure. As the sampling procedure is concerned, the present study was conducted with help of the following procedure:

- Firstly three different districts of Balochistan were selected for the study.
- The coal mines which employed 20 or more coal workers were included in the list to draw the study sample.

3.9 Research Instrument

Structured questionnaire or interview schedule was designed most of the respondents were illiterate. Through interview technique data was collected from 400 respondents of three districts of Balochistan. The researcher used the mother language while translating questions to the respondents.

Following were the parts of research tools for the said study,

- Demographic information
- Worker's health condition in coal mining
- Facilities available for workers at their work place

- Occupational health and safety status in coal mining
- Working condition in coal mining
- Compensation labor union

3.10 Data collection

Keeping in view the sensitivity of labor's time, data was collected on Friday, a holyday for workers, while some of them were also questioned during work. For the collection of data the researcher hired some qualified persons from the study area keeping in view their language, and carefully trained them about interview schedule as well as about research ethics.

3.11 Data analysis

The collected data of the said study was carefully entered in a software called Statistical Package for Social Sciences (SPSS), and then calculated, interpreted and summarized in uni-variate and bi-variate analysis. Bi-variate analysis of data was done through different statistical tests like co-relation, to test the significance of the said hypothesis.

3.12 Delimitation of research

Delimitation of research means, to limit the research boundaries according to scope, resources and time. In every Social science research the researcher first of all delimits the research. The present research study was delimited to under mentioned boundaries.

1. Delimitation of research area, this research was limited to only three districts of Balochistan.

- 2 Delimitation of sample size. this study was limited to those coal mines, where laborers were 20 or more.

3.13 Statistical techniques

Dependent and independent variables have been analyzed through descriptive statistics. The inferential statistics was also applied while exploring the relation between dependent and independent variables. The univariate data was analyzed by descriptive research techniques like mean and median, while bivariate analysis was conducted through inferential research technique like correlation.

3.13.1 Mean

The sum of all values divided by the number of values is called Mean value. In descriptive statistics the Mean is the type of uni-variate data analysis. In the present study Mean was calculated with/by applying the following formula

$$\text{mean} = \frac{\text{sum of elements in set}}{\text{number of elements in set}}$$

3.13.4 Correlation

Correlation is a technique in inferential statistics which explores the relationship between variables. Through this statistical technique the researcher finds the relation between variables that either there is positive or negative relation among the variables, and it also states that how much strong the relation is between variables.

3.13.5 Chi-square

Chi Square test determines how expectations are compared to results. The data used in Chi square Statistics must be random, raw, mutually exclusive, drawn from sample.

Chi-square = Summation $\frac{\text{Square of Observed values} - \text{Expected Values}}{\text{Expected Values}}$

$$\chi^2 = \sum \frac{(o - e)^2}{e}$$

3.14 Operationalization of research variables

Operationalization of research variable is the important step for researcher. By operationalization we mean the measurement of concept and variable, that how to measure the variables of researcher's concept and interest. In the present study the following dependent variables, independent variables and background variables have been operationalized as per researcher's concept.

District where coal mine is located;

Different mines had different working conditions, therefore in present research study this variable has a great importance. The district of working was not asked by the respondent because the number of respondents was already decided to be chosen from each districts. Here 124, 190 and 84 respondents were chosen from Quetta, Loralai, and Harnai respectively.

Age of the respondents;

Age is the physical and mental growth of an individual over a period of time. It is to be considered an important research variable. In the present research age is a background variable, which has a great effect on the overall situation of the study, because the main objective is health and safety of workers. Therefore, age category has multidimensional variation towards health and safety conditions of workers. In the present research age of the respondents was asked as under,

Age of the respondent (complete years) _____

After data collection different age categories were designed for data analysis

1. Less than 25 years
2. 25-30
3. 31-35
4. Above 35

Section of working;

The basic aim of the present study was to explore the health and safety of workers in coal mining, therefore those variables are being discussed which have relation to the health and safety of workers. In this study the section where the respondent is working had the relation to their health status. The question was asked by the respondents in a following manner,

In which section of coal mine are you working?

1 Digging 11 Raising 111 Loading

Workers health condition;

Workers health condition in coal mining is the main focus of the study. This variable was measured through different supportive questions which are as under,

- Are you suffering from any of the following hereditary disease?
- Are you taking any of the following smoking materials?
- Where do you take smoking during work?
- Are you taking any of the following drugs?
- Mention the cause of taking drug
- Do you face any of the following disability (ies)?
- Have you ever been hospitalized?
- Which of the following disease or accident made you hospitalized?

Facilities available at work place;

In the present study facilities at work place had a great concern toward the worker's health and safety status. This variable belongs to the independent variables. The concept was further explored through different variables concerning working facilities to workers at their work place. The respondents were asked as follows,

- Where you eat meal during work?
- Who provide the meal?
- Are you satisfied with the quality of food?
- Is clean drinking water facility available?

- Is proper toilet facility available in coal mines?
- Are you satisfied with the condition of toilets?
- Who provide the residence facility?
- What type of residence facility are you availing?
- Does any hospital or first aid unit available?
- Are you satisfied with the hospital?

Occupational health and safety measures;

Occupational health and safety means the situation of work place regarding worker's health and their safety. There are different means through which the workers health conditions and their safety situation can be made better. Occupational health and safety is the main concern of the present study therefore the researcher used different variables through which the condition of work place can be disclosed. Respondents were asked as,

- Are you aware of Occupational Health and Safety (OHS)?
- Are warning signs available at work place?
- Are you trained to take first aid in emergency?
- What kind of personal protective equipments are available to you?
- Who provide the personal protective equipments to you?
- Do you wear uniform during work?
- Do you wear face mask during work?
- Is the light adequate during work?
- Did you receive training for mining?

Working condition;

Working condition in the present study has great importance, because the main focus of the study is to disclose the difficulties and hazards the worker face during work in coal mining. This independent variable was explored by the help of following questions,

- Are you satisfied with the working environment?
- What are the hazardous sections in mining?
- Are you satisfied with the quality of raising tracks?
- Are you satisfied with the ventilation at work place?
- Have you ever got injured during work?
- What is the length of mine you are working?
- Can you come out of mine for lunch or dinner?
- What are the hazardous sections in mining?
- Is there any checkup of mine before the work starts?
- Who check the mine?

Available labor union;

As the compensation of workers for disease, their health injury or life loses is the basic way through which he or she can be rehabilitated Therefore, the researcher of the present study was also interested to explore the condition of worker's compensation by their union, employer or any other agency The respondents were asked as,

- Is there any labor union?
- Have you ever got health compensation by the union?

- Who bear the hospital expense during injury?
- How much compensation the worker's families get in case of death casualty?
- Who compensate the worker's family in death casualty?

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Univariate Data Analysis

Table 4.1.1. Distribution of the respondents regarding District, Tehsil of working and the Age of the respondents

District of mine		Frequency	Percentage
i	Loralai	190	47.5
ii	Quetta	128	31.5
iii	Harnai	84	21.0
Total		400	100
Tehsil of mine			
i	Duki	190	47.5
ii	Panjpai	128	31.5
iii	Sharag	84	21.0
Total		400	100
Age of the respondents (in complete years)			
i	Less than 25	90	22.5
ii	25-30	225	56.3
iii	31-35	64	16.0
iv	35+	21	5.2
Total		400	100

Table 4.1 shows the district and tehsil in which the present study was conducted. Less than half (47.5%) of the respondents were from district Loralai and its corresponding Tehsil Duki, whereas 31.5% of the respondents were selected from district Quetta, Tehsil Panjpai, and 21% of the respondents were taken from district Harnai, Tehsil Sharag. The population of the study was 2000 mines where probably fifty thousand laborers were employed. The researcher selected the mines where more than 20 laborers were working.

The under discussion table also described the data about the age of the respondents. Age is an important variable in the present study, because literature shows that health and safety situation among laborers differs in different age groups, specifically in such a heavy type of work. Here the data shows different age groups of the respondents who were working in coal mines. Data shows that little less than one fourth (22.5%) of the workers were less than 25 years old, and more than half (56.25%) of the workers were 25-30 years old while 16.0% of the workers were middle age (31-35 years) and a very small portion (5.25%) of the workers belonged to a group of more than age 35 years of age. From the above figures it is clear that most of the workforce engaged in coal mining in Balochistan is young, because 78.75% of the respondents were 18-30 years old which is considered to be young in the world.

Among the previous three decades, the coal business has encountered significant cycles which have significantly influenced the structure of its work power. Taking after extreme reductions in occupations somewhere around 1950 and 1965, business settled around 1965 and 1969, and afterward extended consistently for the following 10 years. With the extension, the industry's work power has ended up more youthful and has more

years of training Coal mining stays a standout amongst the most risky occupations in the United States, in spite of the fact that State and Federal enactment give some insurance. Yet, mining organizations report no deficiency of occupation candidates, and excavators report a high occurrence of employment fulfillment, frequently recognizing "great pay" as a huge variable

Table 4 1 2 Distribution of the respondents regarding their area of residence, native province and their education

Area of residence		Frequency	Percentage
i	Rural	352	88 0
ii	Urban	48	12 0
Total		400	100
Native Province		Frequency	Percentage
i	Balochistan	243	60 8
ii	KPK	85	21 3
iii	Afghanistan	72	18 2
Total		400	100
Education of the respondents		Frequency	Percentage
i	Illiterate	242	60 5
ii	Primary	130	32 5
iii	Middle	28	7 0
Total		400	100

Table 4 1 2 shows the data about area of residence (rural, urban), native province and

education of the respondents. Data shows that majority (88%) of the respondents belonged to rural areas, whereas only 12% possessed urban background. This indicates that urban laborers do not prefer this kind of work, due to its adverse environment and high level of risk. The rural laborers do not have the opportunity like the urban laborers so they are willing to work in highly secure environment.

Table also shows the data of native province of the respondents, in which more than half of the workers (60.8%) belonged to their home province Balochistan, and slightly less than one fourth (21.3%) of the workers belonged to KPK, and a small portion 18.2% belonged to Afghanistan.

The above data shows that majority of laborers were from Balochistan despite its less population.

Respondents were asked about their educational level and their percentages are shown in the above table which indicates that more than half (60.5%) of the workers were illiterate and more than one-fourth of the respondents (32.5%) had primary education. Data further shows that only seven percent of the workers had education, up to middle level.

Table 4.1.3 Distribution of the respondents regarding their marital status and family type

Marital status of the respondents		Frequency	Percentage
i.	Married	236	59.0
ii	Single	164	41.0
Total		400	100
Family type of the respondents			
Variable		Frequency	Percentage
i.	Joint	380	95.0
ii	Extended	18	4.5
iii.	Nuclear	2	0.5
Total		400	100

The respondents were asked about their marital status and their responses are presented in the table. The data shows that slightly more than half (59%) of the respondents were married, whereas little less than half (41%) were unmarried.

The data presented in the above table indicated that an absolute majority (95%) of the respondents were living in joint type of family, whereas 4.5% of the respondents reported that they were living in extended type of family system, while a small portion (0.5%) was living in nuclear type of families.

The above figures show that majority of the respondents were having joint family systems, which clarifies that the strong family bond and normative structure exists in the population.

Table 4 1.4 Distribution of the respondents regarding their male and female family members

Male family members		Frequency	Percentage
i.	8-10	123	30.8
ii	5-7	110	27.5
iii.	10+	97	24.2
iv	Less than 5	70	17.5
Total		400	100
Female family members		Frequency	Percentage
i	10+	128	32.0
ii.	8-10	111	27.8
iii	5-7	83	20.8
iv	Less than 5	78	19.4
Total		400	100

The respondents were asked about the number of their family members, male and female separately. As shown in table, 30.75% of the respondents had 8-10 male family members, whereas 27.5% of the respondents had 5-7 male family members. Slightly less than one-fourth (24.25%) had above 10 male family members while 17.5% of the respondents had less than 5 male family members.

The respondents were asked about the number of their female family members, as shown in the table, more than one-fourth (32%) of the respondents had more than 10 female family members and little more than one-fourth of the respondents (27.75%) had 8-10

female family members, whereas 20% of the respondents had 5-7 female family members while 19.5% of the respondents had less than 5 female family members

Table 4.1.5- Distribution of the respondents regarding their total family income and income from mining labor

Total family income (Rs)		Frequency	Percentage
i.	Less than 50000	29	7.3
ii	50000-60000	190	47.4
iii	60001-70000	97	24.3
iv	70001-80000	53	13.3
v	80000+	31	7.7
Total		400	100
Income from mining labors (Rs)		Frequency	Percentage
i.	Less than 20000	40	10.0
ii	20000-25000	170	42.5
iii	More than 25000	189	47.5
Total		400	100

Monthly income represents the income of workers from all sources included their salaries. The data in the above table reveals that a very small portion (7.3%) of the

respondents were having less than 50 thousands from all sources, and slightly less than half (47.4%) were having 50 to 60 thousands income per month, whereas slightly less than one-fourth (24.3%) of the respondents were getting 60001 to 70000 Rs per month, and 13% of the respondents were having 70001 to 80 thousand Rs per month. Whereas only (7.7%) were getting their total monthly income more than 80 thousands. Mining income represents the income of workers from their mining work, per month. The data in the above table shows that 10% of the respondents had less than 20 thousands per month from their mining labor, whereas less than half (42.5%) of the workers had 20-25 thousands per month, and near to half (47.5%) of the respondents had more than 25000 thousands per month from their mining labor.

A main consideration which encouraged enrollment of new contestants to coal mining has been the high wage structure of the business. Normal hourly profit of generation specialists in coal mining have been among the most astounding of every single mechanical laborer, surpassing the normal for all assembling commercial ventures by 55 percent in 1978. Besides, in perspective of the broad open door for extra time work or for work on weekends or occasions at premium rates, the distinction in full time yearly income has been significantly more prominent than recommended by these correlations. An immediate measure of the profit motivating force connected with exchange to a coal compared so as to mine occupation is given the former income of specialists who entered coal mining somewhere around 1973 and 1975 with those of laborers who were utilized in coal mining in both of these years (Wool, 1981).

Table 4.1.6 Distribution of the respondents regarding their Section of working

	Variable	Frequency	Percentage
i	Digging	229	57.3
ii	Loading	120	30.0
iii	Raising	51	12.8
	Total	400	100

Section of working is the unit in which the worker is performing his duties. This division of labor is needed according to their work expertise. In Coal mine industry there are different types of working sections. The researcher selected only three most important sections, that is Digging, Raising and Loading. The above table illustrates that more than half (57.3%) of the respondents were working in digging section, whereas 30% of the respondents were working in the loading section of working, and only 12.8% of workers were attached to the raising section.

The above data reveals that majority of the respondents were employed in the digging section of coal mining which clarifies that digging is the most basic and hard work in mining process. Only digging out of three sections consists of 57.3% laborers while rest both Loading and Raising sections consist of only 42.8% laborers.

Table 4.1 7 Distribution of the respondents regarding their type of smoking and place of smoking

Type of smoking	Frequency	Percentage
i. Not at all	245	61.3
ii. Cigarette	147	36.8
iii. Hashish	8	2.0
Total	400	100
Place of smoking	Frequency	Percentage
i. Away from coal	138	89.0
ii. Near to coal	17	11.0
Total	155	100

The respondents were asked about their smoking habit, and data shown in the table, which illustrates that majority (61.3%) of the respondents did not have habit of smoking, whereas more than one-third (36.8%) of the respondents were using cigarette as smoking material, and only two percent of the respondents were using hashish for smoking

The data in the above table shows further details regarding respondent's place of smoking. When they were asked about their smoking habit, only 38.7% responded positively, therefore next question was asked about the place of smoking. The data reveals that only 11% of the respondents were smoking near to coal, and an absolute majority (89%) of the respondent was smoking away from coal.

Table 4 | 8 Distribution of the respondents regarding their hospitalization and cause of hospitalization.

Hospitalization		Frequency	Percentage
i	Yes	198	49.5
ii	No	202	50.5
Total		400	100
Reason of hospitalization		Frequency	Percentage
i	Backache	102	51.5
ii	Respiratory	63	31.8
iii.	Accident	21	10.6
iv	Headache	12	6.1
Total		198	100

The above table shows data regarding respondent's hospitalization for any disease or accident. When they were asked, slightly less than half (49.5%) of the respondents said Yes, whereas little more than half (50.5%) of the respondents responded No, they were never hospitalized for any kind of disease or accident.

The specialists' parts at a mine site are to a great degree shifted and work particular. However, numerous positions still include a lot of physical work with assignments including quality, versatility, what's more, strong resolve. Since work force is by and large discontinuous, this raises concern as for musculoskeletal harm following numerous may be caught off guard for high force stacking which may surpass their physical limit.

Sprain and strain injuries remain the most regular injuries managed at coal mines in Queensland. While some of these injuries are the immediate consequence of injury, others may be credited to aggregate harm from rehashed minor damage. Delicate tissue structures of the joints are powerless to micro damage which, if unnecessary, may prompt abuse harm. This happens when the harm surpasses the repair limit of the tissue and the issue may be intensified with expanding age as the potential for repair diminishes (Parker, 2004)

The respondents who responded positively to the question of hospitalization were (49.5%) of the whole population. Therefore, question was asked by them regarding the cause of hospitalization, and their responses are shown in the table. Only six percent of the respondents told that they were hospitalized for headache, whereas little more than half (51.5%) of them responded that they have been hospitalized for backache, less than half (31.8%) of the workers told that they were hospitalized for respiratory problem, whereas only ten percent of the respondents responded that they were hospitalized due to accidents.

Table 4.1.9 Distribution of the respondents regarding their place of meal

Place of meal	Frequency	Percentage
i Outside the mine	230	57.5
ii Inside the mine	166	41.5
iii Hotel	4	1.0
Total	400	100

Table 4.1.9 shows the data regarding the worker's place of eating meal. When the respondents were asked about the place of eating meal, more than half (57.5%) of the workers told that they eat meal outside the mine during their duties, whereas less than half (41.5%) of the respondents responded that they eat meal inside the mine during duty, and only one percent of them told that they go to hotel for eating meal.

Table 4.1.10 Distribution of the respondents regarding availability of toilet facility for workers, their satisfaction of toilets and alternative for toilet

Availability of toilet facility	Frequency	Percentage
i. Yes	146	36.5
ii. No	254	63.5
Total	400	100
Satisfaction of toilet facility	Frequency	Percentage
i. Some	110	75.3
ii. Not at all	36	24.8
Total	146	100
Alternative of toilet for respondents	Frequency	Percentage
i. Toilets	146	36.5
ii. Open areas	254	63.5
Total	400	100

Table 4.1.10 shows data regarding toilets facility provided to the workers at their work premises. When the workers were asked about the availability of toilets facility, 36.5% of

the respondents told that they are having toilets facility, whereas more than half (63.5%) of the workers responded that they do not have proper toilet facility.

Table illustrates the data regarding worker's satisfaction with the available toilet facility. The question was asked by the respondents, in response to which slightly more than three-fourth (75.5%) of the respondents were satisfied up to some extent with the toilet facility, but little less than one-fourth (24.5%) of the workers were absolutely not satisfied with the provided toilets facility.

Table shows data of respondents who had no toilets facility. It shows that 63.5% of the workers responded that they go to open areas to fulfill the toilet need, as no toilets are available.

Table 4.1.11 Distribution of the respondents regarding their types of residence

Types of residence	Frequency	Percentage
i Huts	221	55.3
ii Barak	179	44.8
Total	400	100

Table 4.1.11 shows data regarding the type of residence in which the respondents are living. The data reveals that little less than half (44.8%) of the workers were living in Barak, whereas more than half (55.3%) of the respondents were live in Huts.

The respondents were provided with four options regarding their residence. They were asked that what type of residence facility do you have, Hostel, Flats, Barak and huts? in response to which 53.3% of respondents the responded that they are having huts, 44.8% of them were living in Barak, while there was not a single response of other two options.

(hostel and flats) Despite the existence of government policy of constructing labor colonies, the laborers were not provided with this facility

Table 4.1 12 Distribution of the respondents regarding Hospital facility for workers, provider of hospital, their satisfaction of hospital and the distance of hospital from mine

Availability of hospital facility		Frequency	Percentage
i.	Yes	144	36 0
ii.	No	256	64 0
Total		400	100
Provider of hospital facility		Frequency	Percentage
1	Labor department	144	100 0
Total		144	100
Respondents satisfaction of hospital		Frequency	Percentage
i.	Some extent	106	73 8
ii	Not at all	38	26 3
Total		144	100
Distance of hospital from mine		Frequency	Percentage
i	Less than 5 Km	57	39 8
ii	5 Km	25	17 3
iii	Above than 5Km	62	43 5
Total		144	100

Table 4 1 12 shows data regarding the availability of hospital for workers Majority (64%) of the respondents responded negatively that they have no hospital facility,

whereas more than one-fourth (36%) of the respondents told that they are having laborer hospital facility.

Table further shows that 36% of the respondents said to have hospital facility. They were further asked about the provider of that facility, in which all the respondents 100% told that this facility is provided by laborer department.

Table also shows that when those respondents (36.0%) who replied to have hospital facility were further asked about their satisfaction with hospital facility, little less than three-fourth (73.8%) of the respondents replied that they are satisfied with the hospital up to some extent, while slightly more than one-fourth (26.3%) of the respondents responded that they are absolutely not satisfied with the hospital facility.

Table shows data that when those respondents (36%) who replied to they have hospital facility were further asked about the distance of hospital from their mine of working, 43.5% of the respondents answered that the distance of hospital from their mine is more than 5Km, while 39.8% of the respondents replied that the distance of hospital from their mine of working is less than 5Km, whereas 17.3% of the workers told that the distance is 5Km.

The data shows that majority of laborers were deprived of basic health facility. Despite their risky job the laborers were not provided neither a hospital nor a basic first aid centre. This shows the complete ignorance of laborer's rights by the government and the employer. Data reveals that majority of mines were far away from the district head quarter hospitals. Due to this reason the occupational safety cannot be achieved.

Table 4.1 13 Distribution of the respondents regarding availability of warning signs, personal protective equipments and its provider

Availability of warning signs		Frequency	Percentage
i	Yes	141	35.3
ii	No	259	64.8
Total		400	100
Availability of personal protective equipments			
Variable		Frequency	Percentage
i	None	256	64.0
ii	Facemask	82	20.5
iii	Caps	62	15.5
Total		400	100
Provider of personal protective equipments			
Variable		Frequency	Percentage
i	Employer	144	36.0
Total		400	100

Table 4.1 13 shows the data about the availability of warning signs at work place. Results show that 35.3% of the respondents told to have warning signs, where majority (64.8%) of the respondents replied that there are no warning signs available in their mines of working.

Table illustrates the data about the availability of personal protective equipments (PPE). Results show that majority (64.0%) of the respondents were not provided with Personal

Protective Equipments (PPE), whereas 15.5% of them told that they are provided with the Caps only, while a sufficient portion (20.5%) of the workers replied that they are provided with facemasks

Table shows data about the respondents 36% who responded in the previous question that they are provided with Personal Protective Equipments were further asked about the provider of this facility. All of the respondents (100%) replied that this facility is provided by the employer

Researchers on South African underground mines demonstrate that individual dust control measures can accomplish decreases of between 25 to half of respirable dust. A scope of control measures that demonstration together to diminish presentation dangers is hence vital. These could incorporate strategies for reducing so as to minimize dust levels dust area and techniques for weakening, concealment, catch, and control. Current rules on tending to airborne poisons underscore the significance of distinguishing and portraying all wellsprings of airborne dust, both essential and optional, and appropriately incorporating control intercessions into strategies for picking and looking after hardware, and into the everyday work cycle. While huge instabilities stay in controlling dust exposures and keeping up the viability of controls, the utilization of suitable individual defensive gear (PPE) is essential (Hermanus, 2007)

Table 4.1 14 Distribution of the respondents regarding uniform wearing by the workers and their comfort-ability by wearing uniform

Wearing of uniform		
Variable		Percentage
i	Not at al	69 0
ii	Rarely	30 5
iii.	Frequently	0 5
Total		100
Comfort ability of wearing uniform		
Variable		Percentage
i	Some extent	84 8
ii	Not at all	13 7
iii	Great extent	1 3
Total		100

Table 4.1 14 shows data about respondent's tendency towards wearing uniform during the duty. They were asked in different categories. Their responses are shown in the table. Majority (69.0%) of the workers responded that they never wear uniform during work, whereas more than one-fourth (30.5%) of the respondents told that they rarely wear uniform during duty, while only 0.5% of the workers properly wear uniform during duty.

Table also describes about the comfort-ability of workers by wearing PPE. Those 36.5% respondents who answered in the previous question that they are provided with PPE, their answers also show that majority (84.8%) of the respondents feel comfortable

up to some extent in wearing uniform. 13.8% of the respondents answered that they absolutely do not feel comfortable while wearing uniform whereas 1.3% of the respondent feel comfortable up to great extent

Table 4.1.15 Distribution of the respondents regarding their satisfaction of working environment.

Variable	Frequency	Percentage
i Some extent	332	80.5
ii Not at all	78	19.5
Total	400	100

Table 4.1.15 describes the level of satisfaction of workers by their working environment. Data in the table shows that majority (85.5%) of the respondents were satisfied by their working environment up to some extent, whereas 19.5% of the workers were not at all satisfied with working environment.

Open framework associations are influenced by the adjustments in courses of live. In the consequence of this reaction, emerging from interior and exterior elements, hierarchical changes of the general population in the association are outright. Maybe then the outside variables, changes in the association cause more dynamic changes on people that shape the hierarchical structure. Elements, for example, working spots, behavior and conditions of the specialists influence these progressions experienced in the association in distinctive levels. Particularly, the reaction likelihood is high for the workers that work in coal mining, a region where physical force is utilized strongly, execution criteria are high and

authoritative atmosphere is declined. Actually, the forced impacts make variances in the burnout and responsibility levels of the representatives, so they cause diminishes in execution that are debilitating for the execution approaches in coal mining. One of the main roles of operations is enhancing so as to get more productivity from representatives their abilities and expanding their hierarchical duty. Influenced by the variables, for example, decency, fulfillment, professional stability, hierarchical correspondence, specialist engagement and dependence to representatives inside of the operation, the authoritative duty is likewise impacted by the elements, for example, self determination, support from workfellows and director real, advancement, regarding by society, word related danger, routine and anxiety (Uysal et al. 2015)

Table 4.1.16 Distribution of the respondents regarding their satisfaction with raising tracks.

Variable	Frequency	Percentage
i Some extent	380	95.5
ii Not at all	18	4.5
iii Great extent	2	0.5
Total	400	100

Table 4.1.16 illustrates the level of satisfaction of workers by the raising tracks of their mines of working through which the miners pull luggage with the help of fuel engine. The respondent's responses in the table show that an absolute majority (95.5%) of the workers were satisfied with those raising tracks. While only 4.5% of the workers were

not at all satisfied with tracks. Whereas a very small proportion (0.5%) of the respondents were satisfied with the tracks to great extent.

As the raising tracks are the basic tools through which the process is running. These tracks must be fit so that the level of hazard can be minimized. If not, fit this can lead to very serious fatalities. The researcher felt that there was no skilled technician for the fitting of raising tracks. The tracks were fit by the laborers.

Table 4.1 17 Distribution of the respondents regarding their Injuries occurred during work, Section of injury and the Cause of injury

Injury occurred	Frequency	Percentage
i Yes	36	9 0
ii No	364	91 0
Total	400	100
Section of injury		
Variable	Frequency	Percentage
i Digging	21	58 3
ii Loading	9	25 0
iii Raising	6	16 6
Total	36	100
Cause of injuries		
Variable	Frequency	Percentage
i Mining tools	16	44 5
ii Slippery tracks	11	30 5
iii Mine collapse	9	25 0
Total	36	100

Table 4 1 17 describes the injury during work, cause and section. The respondents were firstly asked about injury during work in response to which nine percent of the workers reported that they got injured during work, whereas an absolute majority (91 0%) of the respondents replied that they never got injured during work

Table further describes the section of injury where the workers got injured. Data in the table reveals that more than half (58.3%) of the respondents got injured in Digging section of working during duty, whereas one-fourth (25.0%) of them got injured in the loading section of working, and 16.6% of the respondents reported that they got injured in the Raising section.

Table further illustrates the reasons due to which the workers got injured during work. The data shows that slightly less than half (44.5%) of the respondents told that they got injured by mining tools, while 30% of the workers responded that their cause of injuries were slippery tracks. Whereas one-fourth (25.0%) of the respondents replied that they become injured due to mine collapse.

The mischance and sick safety record of the mining segment thinks about inadequately to that of other financial parts, for example, assembling, development and rail, prompting mining's notoriety for being the most perilous modern division. Mine surroundings are particularly testing in light of the fact that they can debase reasonably quickly and they change as mining advances. Clean and clamor are intrinsically connected with rock breaking, and in underground mines, air and light must be supplied misleadingly. Impacting, and additionally mining itself, discharges unsafe gasses into the underground environment. Ergonomic perils are normal in mining as diggers by and large handle substantial hardware and do overwhelming work, frequently in cramped conditions. In a few cases ergonomic dangers, which are connected with poor building outline, add to expanded dangers (Walters et al, 2013).

Table 4 1 18 Distribution of the respondents regarding Length of working mine, worker's daily time spends inside the mine and their coming out of mine for meal

Length of mine		
Variable	Frequency	Percentage
i Less than 500m	8	2 0
ii. 500-1000m	143	35 8
iii 1001-1500m	177	44 3
iv Above than 1500m	72	18 0
Total	400	100
Respondent's daily time inside the mine		
Variable	Frequency	Percentage
i No time inside	171	42 8
ii 8 hrs daily	229	53 3
Total	400	100
Respondent s coming out of mine for meal		
Variable	Frequency	Percentage
i No	229	100 1
Total	229	100

Table 4 1 18 describes shows data regarding length of mines in which the workers were employed. The data shows that only two percent of the workers responded that the length of their mines of working is less than 500m; whereas 35 8% of the respondents told that they are working in mines with lengths from 500-1000m, and less than half (44 3%) of

the workers said that their mine's length is from 1001-1500m, while 18% of the respondents replied that their mines of working are deep more than 1500m

Table further describes time which the workers spend inside the mine daily. This question was asked by the workers of digging and raising section of working, because these workers perform their duties inside the mine. The data shows that more than half (53.3%) of the workers spend 8 hours daily inside the mine.

Table shows that 53.3% of the workers were working inside the mine. The question was asked about their coming out of mine for lunch or dinner break, in response to which 100% of the respondents told that they cannot come out of mine for lunch or dinner break.

Table 4.1.19 Distribution of the respondents regarding availability of paid leaves to workers.

Variable	Frequency	Percentage
i. Not paid	256	64.0
ii. 4days/month	144	36.0
Total	400	100

Table 4.1.19 illustrates the data about paid leaves either given or not to the workers per month. The data in the table shows that more than half (64%) of the respondents said that paid leaves are not given to the workers, whereas 36% of the respondents told that they get 4 paid leaves per month.

Paid leaves are the basic right of laborers in any kind of job. As coal mining is very heavy and exhausted task, therefore, the human body demands some relaxation after a specific interval of time. The situation was different in coal mining in Balochistan.

Majority of laborers were not provided with paid leaves and some of them were provided with one week leave. Majority of laborers were even not provided with injury or sick leaves

Table 4 1 20 Distribution of the respondents regarding their opinion about the major causes of accidents.

Variable	Frequency	Percentage
i Toxic gasses	341	85.3
ii Mine collapse	48	12.0
iii Breakup of cable	11	2.8
Total	400	100

Table 4 1 20 shows data regarding laborer's opinion about the major causes of accidents in coal mining. The data shows that majority (85.3%) of the respondents had their opinion that the major cause of accidents in coal mining is Toxic gasses, while 12% of the respondents had the opinion that the major cause of accidents in coal mining is mine collapse, whereas only 2.8% of them hold the opinion that the major cause of accidents is breakup of raising cables. It reveals that toxic gases are the main factor in poor occupational health and safety situation.

The Presence of Methane, Carbon monoxide and Oxygen was measured in chosen coal mine fields of Balochistan and the outcomes demonstrated that gas introduction cutoff points should be than as far as possible given by safety security offices like National Institute of Occupational Safety and Health (NIOSH) and Mine Safety Health Administration (MSHA) USA. The base passable oxygen in underground coal mines according to worldwide guidelines is 18% while it was 14% in Balochistan's coal mines.

Reasonable carbon monoxide levels are 30-33 ppm hour while, watched levels were 35-37 ppm/hour, also methane ought to be 1-10 m³/ton amid mining with a most extreme level of 3.5 m³/ton amid post mining stage however these qualities were 12 and 5 5 separately. The safety issues because of introduction to these gasses included migraine in 93%, laziness or wooziness in 92%, tiredness in 91%, respiratory issues in 88%, shortness of breath in 87%, mid-section torment in 75%, uneasiness/stress in 66% and hypertension in 9% cases Study demonstrates higher grouping of methane and Carbon monoxide gasses, coal tidy and coal particles in our surroundings which are bringing on safety risks in the coal excavators Methane responds with air and uproots oxygen bringing about suffocation and sudden passing happen because of debilitating of cardiovascular sensitizers In a few cases because of oxygen hardship, harm jumps out at some or all organs including the sensory system and the cerebrum creating migraines, unsteadiness, laziness, obviousness, sickness, spewing, and shortness of breath and early maturing Tissues having exceedingly dynamic oxygen digestion system, for example, heart, cerebrum, liver, kidney furthermore, muscle are especially touchy to CO harming prompting quick demise (Azad, 2015)

Table 4.1 21- Distribution of the respondents regarding the checkup of mines before the work starts and about the checking inspector

Check up of mine		
Variable	Frequency	Percentage
i Yes	145	36.3
ii No	255	63.8
Total	400	100
Who check the mine		
Variable	Frequency	Percentage
i Laborers	145	100.0
Total	145	100

Table 4.1 21 shows data regarding checkup of mine before the work starts. Responses in the table show that 36.3% of the respondents responded positively, whereas majority (63.8%) of the respondents told that they never seen any checkup of mine, being carried out before the work starts.

36.3% of the respondents who told in the previous question that checkup of mine is carried out, were further asked about the checker and total 100% of the respondents told that the laborers themselves check the mine before the work starts. It means that there were no technicians available to assure the risk free work.

It is very compulsory to check the mine daily before the work starts or after the exchange of labor shift, but majority of the respondents in the present study responded that their mines are not being checked and some said that mines are being checked by laborers not by skilled personals, which can cause serious accidents.

Table 4 1.22: Distribution of the respondents regarding who bear the injury charges

Variable	Frequency	Percentage
i By laborers own	331	82.8
ii By employer	61	17.2
Total	400	100

Respondents were asked that who bear the hospital charges in case of injury. A good majority (82.8%) of the workers responded that, the laborers themselves bear the hospital charges in case of injury; whereas only 17.2% of the respondents told that the employers bear the hospital charges whenever laborers got injured.

Table 4 1.23: Distribution of the respondents regarding amount of family compensation in case of death casualty and their compensation agency

Amount of compensation		
Variable	Frequency	Percentage
i. 100000-150000	249	62.3
ii. Above 150000	151	37.8
Total	400	100
Compensation agency		
Variable	Frequency	Percentage
i Employer	193	48.3
ii Labor union	207	51.8
Total	400	100

Compensation of workers in case of death casualty is the very common thing practiced all over the world. Therefore, the respondents were asked the question that how much compensation the worker's family get in case of death casualty. Their responses are shown in the table, according to which 62.3% of the worker's families who lose one or more family members in coal mines accidents get 100000-150000 whereas less than half (37.8%) of the respondents told that these families get more than 150000.

This table depicts the descriptive results of variable i.e. who compensate the worker's family in case of death casualty. Less than half (48.3%) of the respondents told that the family of respondents who die during work due to accident had been compensated by the employer; whereas little more than half (51.8%) of the workers responded that the worker's family get compensation by Labor union.

Table 4 1.24 Distribution of the respondents regarding the Accidents, Death and injuries they have witnessed

Accidents witnessed		
Variable	Frequency	Percentage
i Yes	122	30.5
ii No	278	69.5
Total	400	100
Death witnessed		
Variable	Frequency	Percentage
i Not death witnessed	18	14.7
ii One death occurred	2	1.4
iii Two	9	7.3
iv Eight	93	76.2
Total	122	100
Injures witnessed		
Variable	Frequency	Percentage
i No injury	90	73.8
ii. One	15	12.3
iii Two	8	6.5
iv Three	2	1.6
v Four	6	5.0
vi. Five	1	0.8
Total	122	100

Table 4.1.24 illustrates the data of workers who have seen the accidents in coal mines. The data shows that 69.5% of the respondents said that they had never seen the accident in coal mines, whereas 30.5% of the workers responded that they had seen the accident in coal mines.

Majority (76.2%) of the respondents said that the accident they have seen, caused 8 death casualties; whereas 14.7% of the respondent said that there were no any life loss in that accident, while 7.3% of the respondents said that 2 workers were died in the accident they have seen; and 1.4% of the respondents replied that only one worker died in the accident they have seen.

The International Labor Organization (ILO) gauges the yearly number of business related fatalities that happen around the world. Among the figures distributed by the ILO are assessments of the quantity of business related fatalities in South Africa. As indicated by the ILO 1908 specialists altogether kicked the bucket in business related mischance in 200. Around the same time, 288 laborers kicked the bucket in mine accident. Given that diggers represent less than 500,000 specialists (under 4% of the aggregate workforce) in the national workforce which is about 14 million solid, disproportionate rate of business related fatalities (approximately 15%) are connected with mining (Pearson, 2009).

Those respondents who have seen the accidents were further asked about the injured workers in the accident they had seen. Majority (73.8%) of the respondents reported that there was no injured in the accident they have seen, whereas 12.3% of the respondents said that only one worker was injured in that accident, while 6.5% of the respondents told that 2 workers were injured in the accident, and 1.6% of the respondents reported that they seen 6 injured in the accident, and five percent of the respondents responded that

they have seen 4 workers injured in the accident, whereas only 0.8% of the respondents said that they have seen 5 workers injured in the accident

Injuries in using so as to mine accident in Spain evaluated the occurrence rate of mischances of coal mining, petroleum and non-lively minerals. Laborers in the coal mines had the biggest number of fatalities amid 2000, 2007, 2008 and 2009, coming to in year 2000 an aggregate of 17 accident, having a frequency rate of 73.91 for every 100,000 specialists. For every other year higher rates were recorded for specialists of the non-enthusiastic mineral extraction, which in 2003 had the greatest of 20 deadly accident with an occurrence rate of 52.22. Oil extraction was the main movement in which for seven sequential years there have been no fatalities and the most noteworthy frequency rate occurred in 2006, with 2 passings, which spoke to a record of 20.83, despite the fact that this segment has represented 8 to 13% of the aggregate workforce of the mining part. This information proposes that there is a high level of work related safety in this action. Correspondingly, laborers of the coal mining sub segment, in examination with alternate branches of mining, had a higher rate of deadly injuries for word related accident amid the 11 years investigated, topping in 2008 with 581 mischance. In the oil and non-vitality minerals, injuries from mischance are altogether lower than in coal mining (Blanch, 2014)

4.2 Bivariate Data Analysis

Table 4.2.1 Association between reason of hospitalization and the worker's place of meal.

Place of meal	Reason of hospitalization				
	No disease	Headache	Backache	Respiratory	Accident
Hotel	0(0.00%)	0(0.00%)	0(0.00%)	4(100.0%)	0(0.00%)
In mine	34(20.5%)	1(0.6%)	78(47.0%)	46(27.7%)	7(4.2%)
Outside mine	168(73.0%)	11(4.85%)	24(10.4%)	13(5.7%)	14(6.1%)
Values					
	χ^2	Df	p-value		
	160.9	8	.001		

Table 4.2.1 shows the relation between Reason of hospitalization and worker's place of meal. The statistics shows that 4 workers eat meal in hotel and they all had respiratory disease, while 20.8% of the workers who take meal inside the mine showed they do not had any disease, while 0.6% had headache, where as 47% had backache and 27.7% had Respiratory disease, some 4.2% had faced accident. In order to calculate association between reason of hospitalization and worker's place of meal, Chi-square analysis was conducted by using SPSS. Results indicate that there was a significant association between Reason of hospitalization and worker's place of meal ($p < .001$, $\chi^2 = 160.92$, $df = 8$).

Table 4.2.2 Association between reason of hospitalization and the district of coal mining

District of coal mining	Reason of hospitalization				
	No diseases	Headache	Backache	Respiratory	Accident
Quetta	69(54.8%)	0(0.00%)	41(32.5%)	15(11.9%)	1(0.8%)
Loralai	98(51.6%)	10(5.3%)	34(17.9%)	33(17.4%)	15(7.9%)
Harnai	35(41.7%)	2(2.4%)	27(32.1%)	15(7.9%)	5(6.0%)

Values		
χ^2	Df	p-value
26.6	8	0.001

Table 4.2.2 shows the association between Reason of hospitalization and worker's district of working. Statistics which show the diseases found in the workers who were working in Quetta are, 54.8% were having no diseases, whereas 32.9% were having backache. Statistics of 11.9% had Respiratory disease and only 0.8% had exposed accident. The workers working in district Loralai were, 51.6% had no disease, 5.3% of workers were having Headache, whereas 17.9% of workers had Backache and 17.4% of workers were having Respiratory diseases, some 7.9% experienced accidents. As for as district Harnai is concerned, 41.7% workers were having no diseases, whereas only 2.4% of them had headache, 32.1% of the workers were having Backache and 7.9% of the workers had Respiratory problems, while six percent of the workers had faced Accidents. Association between the reason of hospitalization and respondent's district of working was analyzed by chi-square test.

The Chi-square results show that there is a significant association between Reason of hospitalization and the worker's district of working ($p < 0.001$, $\chi^2 = 26.25$, $df = 8$)

Table 4.2.3 Association between reason of hospitalization and section of working

Section of working	Reason of hospitalization				
	No Disease	Headache	Backache	Respiratory	Accident
Digging	60(26.2%)	11(4.8%)	98(42.8%)	52(22.7%)	8(3.5%)
Raising	43(84.3%)	1(2.0%)	1(2.0%)	3(5.9%)	3(5.9%)
Loading	9(82.5%)	0(0.0%)	3(2.5%)	8(6.7%)	10(8.3%)
Values					
χ^2		Df		p-value	
151.793		8		.001	

Table 4.2.3 shows the association between Reason of hospitalization and worker's Section of working. Statistics shows that, 26.2% of workers from digging were having no diseases, whereas 4.8% were having headache, 42.8% had backache, 22.7% had Respiratory problems, and 3.5% of them faced accidents. While 84.3% of workers working in Raising were having no disease, only two percent of workers were having Headache, two percent of workers had Backache and 5.9% of workers were having Respiratory diseases, while some 5.9% experienced accidents. Majority (82.3%) of the workers in Loading section were having no diseases, whereas only 2.5% of them had backache, 6.7% of workers had Respiratory problems, and 8.3% of workers in Loading section had faced Accidents. Association between the reason of hospitalization and respondent's section of working was analyzed by chi-square test. The Chi-square results

show that there is a significant association between Reason of hospitalization and the worker's section of working ($p < 0.001$, $\chi^2 = 151.793$, $df = 8$)

Table 4.2.4. Association between reason of hospitalization and laborers coming out of mine.

Coming out of mines for meal	Reason of hospitalization				
	No Disease	Headache	Backache	Respiratory	Accident
Yes	130(76.0%)	1(0.6%)	14(8.2%)	12(7.0%)	14(8.2%)
No	72(31.4%)	11(4.8%)	88(38.4%)	51(22.3%)	7(3.1%)
Values					
	χ^2	Df	p-value		
	98.81	4	.001		

Table 4.2.4 shows the association between Reason of hospitalization and worker's coming out of mine. Statistics shows that, 76% of workers who do not come out of mine were having no diseases, where as 0.6% were having headache, 8.2% had backache disease, seven percent had Respiratory problems, and 8.2% of them faced accidents. 31.4% of workers who come out of mine for meal were having no disease, while 4.8% of workers were having Headache, 38.4% of workers had Backache, 22.3% of workers were having Respiratory diseases, and 3.1% of workers who come out of mine for meal experienced accidents. Association between the reason of hospitalization and the workers coming out of mine for meal was analyzed by chi-square test. The Chi-square results

show that there is a significant association between Reason of hospitalization and the workers coming out of mine for meal

($p < 0.001$, $\chi^2 = 98.81$, $df = 8$)

CHAPTER FIVE

RESULTS AND DISCUSSIONS

5.1 Major Findings of the Study:

- Little more than half of the respondent (56.25%) were from 25-30 years old
- Significant majority (88.0%) of the respondents belonged to rural areas
- More than half (60.8%) of workers belonged to their home province Balochistan, while 21.3% and 18.2% of workers belong to KPK and Afghanistan respectively
- More than half (60.5%) of the workers were illiterate, whereas 32.5% were educated up to primary level
- More than half (59%) of the respondents were married, while 41% of the respondents were unmarried
- Absolute majority of the respondents (95%) were living in joint type of family system
- Majority (30.75%) of the respondents had 8-10 male family members, while 24.25% of the respondents had more than 10 male family members
- Thirty two percent of the respondents had more than 10 female family members, whereas slightly more than one-fourth (27.75%) of the respondents had 8-10 female family members
- Slightly less than half (47.5%) of the respondents were having 50 to 60 thousands income per month
- Near half (47.25%) of the respondents had 25001 to 30 thousands per month income from there mining laborer

- More than half (57.3%) of the respondents were working in Digging section of mining
- More than half (61.3%) of the respondents did not smoke
- Majority (89.0%) of the respondent were smoking away from coal
- Almost half (50.5%) of the respondents were not ever hospitalized for any kind of disease or accident
- Little more than half (51.5%) of the respondents responded that they have been hospitalized for backache
- More than half (57.5%) of the workers told that they eat meal outside the mine,
- Significant majority (75.5%) of the respondents were satisfied up to some extent with the toilet facility
- Slightly more than half (55.3%) of the respondents were having Huts type of residence
- The majority (64.0%) of the respondents responded negatively to have hospital facility
- Little less than three-fourth (73.8%) of the respondents replied that they are satisfied with hospital up to some extent
- Less than half (43.05%) of the respondents answered that the distance of hospital from their mine is above 5Km
- More than half (64.8%) of the respondents replied that there are no warning signs available in their mines of working
- Significant majority (64.0%) of the respondents were not provided with Personal Protective Equipments (PPE)

- Majority (69 0%) of the workers responded that they never wear uniform during work
- Considerable majority (84 8%) of the respondents were feeling comfortable up to some extent in wearing uniform while duty
- More than three-fourth (85 5%) of the respondents were satisfied by their working environment up to some extent
- Absolute majority (95 5%) of the workers were satisfied with raising tracks
- Majority of the respondents (91 0%) had never got injured during work
- More than half of the respondents (58 3%) got injured in Digging section of working
- Slightly less than half of the respondents (44 5%) got injured by mining tools
- Less than half (44 3%) of the worker's mine's lengths were from 1001-1500m
- More than half of the workers (53 3%) spend 8 hours daily inside the mine
- All of the respondents who work inside the mine cannot come out of mine for lunch or dinner break
- Majority of the respondents (64 0%) were not given paid leaves
- Significant majority of the respondents (85 3%) had their opinion that the cause of major accidents in coal mining is Toxic gasses
- Significant majority of the workers (82.8%) responded that the laborer himself bear the hospital charges in case of injury
- More than half (62 3%) of the workers responded that the families of those workers who die in mine accident get 100000-150000
- Almost half of the workers (51 8%) responded that the worker's family gets compensation by Labor union

- More than half (69.5%) of the respondents never seen the accident in coal mines
- Majority (76.22%) of the respondents said that the accident they have seen, caused 8 death casualties

5.2 Conclusion of the Study

The study conducted under the title of "Occupational Health and Safety in Coal Mine Industry, Analyzing the Situation of Coal Mine workers in Balochistan Province" explores the health and safety situation of laborers in coal mines. The research found that there were many difficulties faced by the workers at their work place regarding occupational health and safety. In coal mines of Baluchistan generally and the area of present study specifically the laborers health and safety situation was adverse. Different factors like laborers unawareness about occupational health and safety, unavailability of medical facilities, unavailability of Personal Protective Equipments, and poor administration of labor union and lack of attention from the concerned authorities made the situation worse. As there was no effective system available to maintain the injuries and death record, therefore the sense of deprivation was not developed among the laborers and the employers. The causes of occupational injuries were, untrained labor force, poor management of workplace, contamination of toxic gases in mines and unavailability of hospital or first aid units to laborers. On the other hand causes of poor occupational health were heavy work, eating of meal inside the mines, poor condition of residential facilities and unavailability of health care facilities. Furthermore, the absence of technical facilities like proper checkup of mines, raising tracks, pulling engine operators and skilled technicians negatively affect the occupational health and safety in coal mines laborers in Baluchistan. The researcher concluded that if the above factors of hurdles reduced to some extent the situation of occupational health and safety can be restored.

5.3 Suggestions

In order to regulate the occupational health and safety in coal mine laborers in Baluchistan, the following recommendations are being suggested to be implemented

- Studies regarding the health and safety status in coal mines should be carried out on organizational as well as educational level
- Labor Department should focus the occupational health and safety situation up to grass root levels so that laborers exploitation by employers can be mitigated
- Basic necessities like labor hospitals, labor schools and labor colonies should be provided
- Basic skilled training about mining work should be provisionally given to laborers
- Provision of paid leaves to laborers can reduce the adverse effects of occupational health and safety
- Proper check of mines before the work starts is compulsory to reduce the injury and death casualty in coal mines
- Personal Protective Equipments should be provided to each laborer in mining
- The occupational health and safety in coal mines of Baluchistan needs further researches on the employers so that both the sides could be examined
- Disease, injury and death compensation by the government or employer should be given to laborers in coal mining
- Compensation labor union should be encouraged by the government in this regard

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Date _____

Occupational Health and Safety in Coal Mine Laborers, Analyzing the Situation in Coal Mine Laborers in Balochistan

Interview schedule

District _____ Village _____

1. Age of the Respondent (in complete years) _____
2. What is your area of Residence? I Urban II Rural
3. From which area do you belong? Village _____ district _____ province _____
4. What is your Education

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16+
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5. What is your Marital status?
I Single II Married III Divorced IV Separated
6. What is your Family type? I Nuclear II Joint III Extended
7. How many Family members are there in your family?
I No of Male members _____ II, No of Female members _____
8. What is your Monthly income from all sources? Rs _____
9. What is your Monthly income from Mining Labor? Rs _____
10. What is your earning status? I daily paid II Monthly salary

11. In which section of coal mine you are working? i Digging ii Raising iii Loading

12. Do you work in Double shift? i Yes ii No if (ii) go to Q 14

13. How many days in a month you work in double shift? _____

Workers Health Condition

14. Are you suffering from any of the following hereditary disease?

<input type="checkbox"/> i diabetes	<input type="checkbox"/> ii Colour blindness	<input type="checkbox"/> iii Sickle cell anemia	<input type="checkbox"/> iv Thalassemia	<input type="checkbox"/> v Cardiovascular diseases
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15. Are you taking any of the following materials?

<input type="checkbox"/> i. Bin	<input type="checkbox"/> ii Cigarette	<input type="checkbox"/> iii Hookah	<input type="checkbox"/> iv Hashish
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16. Where do you take this during work?

<input type="checkbox"/> i. Inside the mine	<input type="checkbox"/> ii Outside the mine	<input type="checkbox"/> iii Near to coal	<input type="checkbox"/> iv Away from coal
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17. You taking any of the following drugs

i Alcohol ii Inhalants iii Opiates iv Barbituates v Marijuana vi Not at all

18. Please mention the cause of taking drug

i To relief from Pain _____ ii Insomnia _____ iii To avoid Depression _____

19. Do you face any of the following disability(ies)?

<input type="checkbox"/> i Arm	<input type="checkbox"/> ii Limb	<input type="checkbox"/> iii Ear	<input type="checkbox"/> iv Eye	<input type="checkbox"/> v Not at all
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20. In which section of working you become disable?

<input type="checkbox"/> i Digging	<input type="checkbox"/> ii Raising	<input type="checkbox"/> iii Loading
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21. Have you ever been hospitalized? i Yes ii No if (ii) go for Q23

22. Which of the following diseases made you hospitalized?

<input type="checkbox"/> i Headache	<input type="checkbox"/> ii Backache	<input type="checkbox"/> iii Respiratory problem	<input type="checkbox"/> iv Itching	<input type="checkbox"/> v Epilepsy	<input type="checkbox"/> vi Accident
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Facilities Available at Workplace

23. Where do you eat meal during the duty?

<input type="checkbox"/> i At canteen	<input type="checkbox"/> ii Hotel	<input type="checkbox"/> iii In mine	<input type="checkbox"/> iv Outside the mine
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24. Who provide the meal ? i Employer ii Your own

If (ii) go for Q 26

25. Are you satisfy with the quality of food?

<input type="checkbox"/> i. To some extent	<input type="checkbox"/> ii To great extent	<input type="checkbox"/> iii Not at all
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26. Is clean drinking water facility available at the workplace? i Yes ii No

If (i) go for Q 28

27. What is your arrangement for clean drinking water? _____

28. Is proper toilets facility available for workers? i Yes ii No

If (ii) go for Q 30

29. Are you satisfy with the toilet facility?

<input type="checkbox"/> i. To some extent	<input type="checkbox"/> ii To great extent	<input type="checkbox"/> iii Not at all
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30. Where do the workers go for toilets? _____

31. Who provide the residence facility for workers?

i Employer ii Workers own arrangement

32. What type of residence facility you are having?

i Hostel	ii flats	iii Barak	iv.Huts
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33. Is there any hospital or first aid unit available? i Yes ii No

If (ii) go for Q 37

34. Who made this facility available?

i Govt	ii Labor department	iii Private	iv Labor union
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35. Are you satisfy of hospital?

i To some extent	ii To great extent	iii Not at all
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36. What is the distance of hospital from mine? _____ km

Occupational Health and Ssafety Measures(OHS)

37. Are you aware of Occupational Health and Safety?

i To some extent	ii To great extent	iii Not at all
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38. Are the warning signs available at workplace? i Yes ii No

39. Are you trained to take first aid in emergency?

i To some extent	ii To great extent	iii Not at all
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40. What kind of Personal Protective Equipments are available?

i Uniform	ii Caps	iii Headlights	iv Dust glasses	v Facemasks	vi Shoes	vii None
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41. Who provide the PPE?

i By employer ii By your self

42. Do you wear uniform during work?

<input type="radio"/> 1 Frequently	<input type="radio"/> 11 Rarely	<input type="radio"/> 111 Not at all
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43. What can be the possible reason for not using the PPE? 1 Unawareness 11

Not affordable 111 UNavailability of washing facility

44. Do you wear facemask during work?

<input type="radio"/> 1 Frequently	<input type="radio"/> 11 Rarely	<input type="radio"/> 111 Not at all
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45. Do you feel comfortable by using the (PPE) 1 Yes 11 No

46. Are you satisfy by the quality of PPE?

<input type="radio"/> 1 To some extent	<input type="radio"/> 11 To great extent	<input type="radio"/> 111 Not at all
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47. Is the light adequate during work? 1 Yes 11 No

48. Do you received any skill training for coal mining? 1 Yes 11 No

Working Condition

49. Are you satisfy by the working environment?

<input type="radio"/> 1 To some extent	<input type="radio"/> 11 To great extent	<input type="radio"/> 111 Not at all
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50. What are the hazardous sections in mining process?

<input type="radio"/> 1 Digging	<input type="radio"/> 11 Raising	<input type="radio"/> 111 Loading
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51. Who install the tracks inside the mines? 1 Laborers 11 Technician

52. Are you satisfy with the quality of tracks?

<input type="radio"/> 1 To some extent	<input type="radio"/> 11 To great extent	<input type="radio"/> 111 Not at all
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53. Are you satisfy by the ventilation at your workplace? 1 Yes 11 No

If(i) go for Q 55

54 What is the reason of dissatisfaction? Describe _____

55. Have you ever injured during the work? i Yes ii No

If (ii) go for Q58

56. In which working section you got injured?

i Digging ii Raising iii Loading

57 What was the reason of injury? Please Describe _____

58. What is the length of mine in which you are working? _____ meters

59. How much time you spend inside the mine daily? _____ hrs

60. Can you come out from mine for lunch or dinner break? i Yes ii No

61. How many paid leave are given to laborers in a month? _____ Days

62. How many working hours are in a single shift? _____ Hrs

63. In your opinion what are the major causes of accidents?

i mines collapse ii Slippery tracks iii Brake of train cable iv Toxic gasses

64. Is there any checkup carried out of mine before the work starts?

i Yes ii No

If (ii) go for Q 66

65 Who check the mine?

<input type="checkbox"/> i Laborers	<input type="checkbox"/> ii Labor Department	<input type="checkbox"/> iii Owner's technician
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Compensation Labor Union

66. Is there any labor union available? Yes No

67. Have you ever got health compensation by labour union? Yes No

68 Who bear the hospital charges in case of any injury?

<input type="checkbox"/> By worker himself	<input type="checkbox"/> By labor union	<input type="checkbox"/> By labor department	<input type="checkbox"/> By employer
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69 How much compensation the worker s family got in case of death casualty?

(thousands) 10-49 50-99 100-150 Above than 150 Not at all

70. Who compensate the worker's family in case of death casualty?

<input type="checkbox"/> Employer	<input type="checkbox"/> Government	<input type="checkbox"/> Labor union
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71. Have you ever seen the accident in coal mine? Yes No

72 How many people were died in that accident? _____

73. How many were injured in that accident? _____