# HEALTH STATUS AND PHYSIOLOGICAL CONDITION OF GARMENTS, TEXTILE & FIRMING WORKERS IN BANGLADESH

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# Declaration by Research Candidate

I, Md. Tanbirul Islam, hereby declare that the dissertation entitled "Health Status And Physiological Condition Of Garments Textile and Firming workers In Bangladesh" submitted by me to Department of Pharmacy at East West University, in partial fulfillment of the requirement for the award of the degree of Masters of Pharmacy is a complete record of original research work carried out by me during the period April 2015-December 2015 under the supervision and guidance of MS. Farhana Rizwan, Assistant professor of East West university.

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# Certificate by the Supervisor

This is to certify that the dissertation entitled“Health status and mental condition of workers in Bangladesh” is a cross sectional type of study done by Md.Tanbirul Islam in a partial fulfillment of the requirements for the degree of Masters of Pharmacy.

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# Abstract

Readymade Garment and textile Industry is the most important sector of earning foreign currencies that strengthen the economy of Bangladesh for the last couple of decades. At the same time this industry opened a new door of employment for the rural marginal people. The working environment of the garment factories is not congenial to health and the income level of the workers in this industry is very poor to keep up their minimum living requirements in the society. As a result, the workers in the readymade garment industry are not physically and mentally sound to do the work efficiently.

Another is firming house or factories that fulfill the local demand of our country. Firming worker faced many problems with their profession. Keeping this in mind, the study has been conducted to identify the major health problems of the workers in the garment Textile industry and firming workers of Bangladesh. In this study workers have been interviewed personally and collected data have been analyzed through factor analysis to identify the major health problems of the workers derived from the working environment and the nature of their job. This study identified more than fifteen major health problems of the workers. They are pain in body muscles, eye stain, neck pain, hepatitis, frequent headache, cut injury, fatigue, common cold, Heart burn, loss of appetite, numbness and tingling of fingers and arms, gastric pain and helminthiasis etc. The government along with other concern bodies should take necessary action to overcome the health problems of the workers so that they can contribute more for the development of the readymade garments, Textile industry and firming industry of Bangladesh.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction:

Industrialization is not a new concept but over the last decade the process of industrialization has greatly increased in Bangladesh Due to rapid growth of the population in the last few decades the Bangladeshi labor force has grown rapidly, as there was a large proportion of young people born in the 1960s and 1970s. According to the EIU Country Profile the Bangladeshi labor force almost doubled in a matter of a decade, growing from 30.9 million people in 1985-86 to 56.0 million people in 1995-96. Although all sectors of the national economy experienced significant growth, they were far below the speed of the labor force growth. According to Bangladesh national statistics, in 1995-96 only 12.4 percent of the labor force had formal employment, while 40 percent were considered "employed in family-based" businesses, 29.6 percent were considered "self-employed," and 17.9 percent had their jobs on a "daily basis." In general, the competition for working positions in the country is intense, and the working conditions are very harsh, especially in rural areas, where 63 percent of the labor force are employed. The economy of Bangladesh is largely dependent on agriculture. However the Ready–Made Garments (RMG) sector has emerged as the biggest earner of foreign currency. The RMG sector has experienced an exponential growth since the 1980s. The sector contributes significantly to the GDP. It also provides employment to around 4.2 million Bangladeshis, mainly women from low income families (Bazlul Khondhker, 2009).

The garment industry of Bangladesh has been expanding rapidly since late 1970s. As new industries expand, the labour force grew with the economy of the country, at the same times the health hazards for those workers present there in various occupational diseases and accidents highly prevailed among the workers (Zohir, 1996).

WHO defines, Health as a state of complete physical, mental and social wellbeing and not merely the absence of diseases or infirmity (WHO, 1948).Occupational health hazard is concerned with health hazard in relation to work environment.

The science of occupational health hazards covers a wide field, like work physiology, occupational hygiene, occupational psychology, occupational toxicology etc (Harrington, 1990).

The physical and mental health status of garment workers and spinning mills workers and how problem affect labour productivity, competitiveness of the garment industry in the world market and the working life of the workers, particularly of female workers. Various illnesses and diseases were widespread among the garment workers. A large number of workers found to continue their work even they were suffering from various diseases and illness. Though the garment workers were very young they suffered from anemia, female diseases, dysentery, etc. Moreover, the competitiveness of the garment industry in the world market was seriously affected by the ill health of the workers, since ill health decreases the labour productivity to a great extent. Most of the health problems that the garment workers suffered from arose from the occupational hazards including long working hours, absence of leave facilities, congested and over-crowded working conditions, absence of health facilities and safety measures, absence of staff amenities, lack of safe drinking water etc (Paul- Majumder, 2003).

The occupational health and safety service in Bangladesh is still in the developmental stage. Here the occupational health & safety refers mainly to needs of workers of industries or some manufacturing processes but does not completely cover all occupations of the country. The main laws related to occupational health & safety in this country is the Factory Act 1965 and the Factory Rule of 1979. There are a number of other laws and regulations that are also have some provisions related to occupational health and safety. These laws have provisions on occupational hygiene, occupational diseases, industrial accidents, protection of women and young persons in dangerous occupations and also cover conditions of work, working hours, welfare facilities, holidays, leave etc. But most of the laws are lacking in standard values and not specific rather general in nature. For certain work environment factors, manufacturing process, machineries and toxic substances, certain levels or concentrations of substances in the air have been recommended by various international organization and agencies, which are considered to be safe, are implemented in the respective countries.

In USA Occupational Safety and Health Administration (OSHA) are referred for the permissible levels or various standard limits for working environment. In Bangladesh no such organization or agencies have been developed which could be a referral center for different standard or occupational permissible limits. As such the prevalent rules and regulations in Bangladesh are insufficient or inadequate in terms of standards and permissible

limits. It is of concern that in Bangladesh like other developing countries pre-existing malnutrition and a high incidence of infectious disease, however, frequently compound the problems of exposure to occupational hazards (ILO, 2009).

Poultry farming is the raising of domesticated birds such as chickens, ducks, turkeys and geese for the purpose of farming meat or eggs for food. Poultry are farmed in great numbers with chickens being the most numerous. More than 50 billion chickens are raised annually as a source of food, for both their meat and their eggs. Chickens raised for eggs are usually

called layers while chickens raised for meat are often called broilers. In the US, the national organization overseeing poultry production is the Food and Drug Administration (FDA). In the UK, the national organization is the Department for Environment, Food and Rural Affairs (Defra).

Poultry is an emerging and important sector that has been contributing progressively to our economy for the past decade. Poultry is one of the fastest growing and most promising industries with the brightest of futures for our country. Poultry sector are playing a very vital role in the reduction of poverty, malnutrition and unemployment problems of our country. Bangladesh is now an active participant of global Poultry network. Through this site our poultry entrepreneurs and technologists will get a chance to interact with national or international counterpart colleagues engaged in poultry related business, development, education and research. The technological development in housing, incubation, management and automation exhibits will help boost our industry to modern farming system.

The poultry industry has undergone phenomenal growth over the past 20 years, made possible by the continuous dedication of those individuals working in different segments of the industry, including farms, hatcheries, processing plants, and feed mills. These people are subject to occupational and environmental hazards on a daily basis. Airborne exposure, injuries, and zoonotic infections are amongst the main categories of health hazards. Farm employees, especially new and untrained ones, are usually at a greater risk. Also, those who live near to poultry farms, hatcheries, and processing plants can also be exposed to health hazards through air, water, and soil (Hartung et al., 2007)

## 1.2 Contribution of the Textile industries like Spinning mills to the Bangladesh Economy:

Development of spinning industry in Bangladesh is closely associated with the development of Textile and Clothing (T&C) sector as a whole. Power-driven modern textiles in Bengal were traced back to early twentieth century. Before 1947, modern textiles were only the composite textile mills having spinning and weaving facilities. Later, activities like specialized textile weaving, knitting and hosiery and dyeing-printing-finishing were added. During 1947, there were about 11 composite textile mills in Bangladesh (then East Pakistan) with 1.1 millions spindles and 2.7 thousand looms. Spindles grew to 3.2 millions in 1956 but declined to 0.8 million in 1972 as worn-out obsolete spindles went out of operation. In 1972, large-scale manufacturing units were gradually denationalized. By 1999, spindles install

were 2.8 million (2.4 million in the private sector and 0.4 million in the public sector) with an annual production capacity of 200 million kg (Adnan Maroof Khan et al., February 2013*).*

Board of Investment (BOI) sectoral survey found that in 2004, about 3.44 millions spindle producing 302 million kg of yarn for the textile industry. The spinning sector census was conducted during March-June 2004. Initially, a spinning population frame was prepared combining the lists of BOI registered mills and Bangladesh Textile Mills Association (BTMA) members. Total 198 spinning mills were listed and all of them were surveyed. In practice, 10 units could not be traced, while 17 mills were found closed and 13 mills undertook on action to implement their projects. In terms of spindle capacity, only 10.7% spindles were found inactive while 81.2% spindles were in production. A geographical analysis of the active spinning mills demonstrates that about 81.6% of mills are located in Dhaka division and 11.4% in Chittagong division. ON the other hand, Khulna, Rajshahi, Sylhet and Barisal divisions have only 2.5%, 1.3%, 1.3% and 1.9% mills respectively.

It was observed that among all 158 active mills, almost all the mills (96%) were set up by the local entrepreneurs. Only 4% mills have been established jointly with the foreign investors. Total investment in the active spinning mills was amounted to Taka 8,554 cores. The survey found that about 92,172 people were working in the spinning sub-sector including only 85 foreign experts / technicians (Quddus et al., 2000*).*

The products of the spinning sub-sector are yarns of different categories like cotton, polyester, synthetic, acrylic, filament, woolen etc. Production data shows that 138 in production spinning mills produced 382.11 thousand MT of yarn in 2003 of which 81% were cotton yarn. Some secondary sources indicate that in 1999, yarn production of 112 million kg satisfied only 22% of total yarn requirement of the country. the total demand-supply gap of yarn for 1996-97 was million kg, which increased to 639 million kg in 2002. Import pattern of yarn into Bangladesh also illustrates the intensity of demand. Major sources of yarns are Taiwan, China, Hong Kong, Korea, Indonesia, India and Thailand. It Shows the potential of spinning for further investment.

The success of a robust textile sector largely depends upon an improved and reliable spinning sub-sector. If spinning sub-sector produces substandard / inferior yarn, its adverse effect persists right across the entire value chain. Availability of raw materials, transportation, port facilities and tariff rationalization are the key challenges to the spinners. The Government has been supporting the spinners reduced tax rate, and low-cost funding etc (Bhasin et al., 2 May 2013).

Textile & Clothing is the largest manufacturing sector of Bangladesh providing over 4 million jobs, accounting for 5% of GDP, 40% of manufacturing value addition and 75% of total foreign exchange earnings. The growing demands for yarn in the local market, comparatively low cost of doing business, lucrative incentive package, favorable investment policy regime etc are the main reasons for investment in this sustainable sector. There has been a steady growth in the field of spinning mills during for the last two decades. The spinning industry enjoyed a rise up to 345, 07-08 fiscal years. out of

610000 manpower employed in sector, 500000 are woman (BGMEA,2008), this is Mainly because the industry is quite susceptible to fluctuation in employment as a Result of seasonal variations and fashion changes. These characteristics demand a Labour market with high flexibility, a market in which labour is easily found when it is needed and is easily disposed off when not wanted. Very little is known about the socioeconomic conditions of the spinning mills workers because specific study on livelihood pattern of woman workers are very limited. The availability of a large number of unskilled or semi-skilled women workers for employment has been an important contributing factor in the growth of the spinning

industry in Bangladesh. Spinning is the first step in textile value chain that adds value to the fibrous substances by converting them into yarn or thread through the processes of drawing, twisting and winding. Characteristics of the yarn very based on the materials used, fiber length and alignment, quantity of fiber used and degree of twist. The earliest spinning probably involved simply twisting the fibers in the hand. Latter, the use of a stick to help twist the fiber was introduced (Titumir et al.,19 August 2003*).*

Drop spinning involves the use of a stick with a whirl or weight to stabilize the spinning of the stick (called a spindle). The spindle is spun, and hanged and hanged supported by the yarn as more fiber is introduced. This introduced fiber picks up the twist and becomes yarn. However, the development of spinning wheel allowed a continuous and faster yarn production. Spinning wheels are either foot or hand powered. Modern powered spinning, originally done by water or steam power but now done by electricity, is vastly faster than hand spinning. Materials that can be used to create yarn fall into three broad classes: plant, animal, and synthetic. Plant materials: cotton, flax (to produce linen), hemp, raffia, yucca, coconut, husk, etc. Animal materials: wool, goat (angora or cashmere goat), rabbit (angora), alpaca, dog, camel, silk, etc. Synthetic materials: polyester, nylon, rayon, acetate, Mylar, etc. Apart from the above, mineral materials like asbestos are also used, but not very often (Hossain et al., 2001)

**1.3 Workers around the world:**

Despite vast differences in their physical, social, economic, and political environments—face virtually the same kinds of workplace hazards. These hazards are traditionally categorized into four broad types: chemical, biological, physical, and psychosocial. What emerges from our incomplete knowledge of their risk, however, is that the more than 80 percent of the world's workforce that resides in the developing world disproportionately shares in the global burden of occupational disease and injury. Several classic occupational diseases, such as silicosis and lead poisoning, that have been substantially eliminated in industrial countries remain endemic elsewhere in the world. Whether this high and preventable burden of ill health faced by workers in the developing world is the result of ignorance, inattention, or intent, compelling evidence indicates that work-related health conditions could be substantially reduced, often at modest cost (Rosenstock at al., 2006).

### 1.4 Poultry Firm Worker:

A worker who works on a farm where domestic fowl are bred and raised for eggs and/or meat.

### 1.5 Common health hazards:

According to the International Labour Organization (ILO), health hazards in poultry working environments are categorized as accidental, physical, chemical, and biological. Here are just a few examples for each category mentioned by this organization.

### 1.6 Various Hazard on this job:

**Short- and long-term:**

Public awareness is of critical importance in this regard. In a study carried out in the US many years ago, 55.1% of individuals participated in the study were not concerned about the waste (manure, feathers, dead birds, etc) produced by the poultry industry. Waste was a concern for only 35.5% of the respondents. However, it seems that people are starting to become more aware of health issues related to poultry environments. The main objective of this article is to re-emphasize the crucial importance of minimizing health hazards for employees in commercial poultry production settings. Both employees and employers should be aware of short- and long-term consequences of occupational hazards. Common occupational hazards in different sectors of the poultry industry (e.g. farms, hatcheries, processing plants, and feed mills) include dust/gases, musculo-skeletal disorders (traumatic injuries), infectious diseases, and exposure to chemical, biological, and physical agents. Poultry producers are often more concerned about the health and productivity of their fl ocks than of health hazards to themselves or their employees.( Kirychuk SP et al, 2003)

**Accident Hazard:**

Sprains and strains from slips, trips, and falls when carrying heavy loads (bags of feed), working in congested and slippery areas soiled with excreta Eye and skin irritation from contamination of broken skin or from splashing of irritants, allergens, other hazardous fluids (disinfectants) during vaccinating/medicating (in feed/water), mixing of feed, transporting

feed/medicines, or spraying vaccines, disinfectants, and fumigating agents Burns from exposures to hot surfaces (e.g. incubators, debeaking tools).

**Physical Hazard:**

Heat exhaustion, heat-induced dermatosis, sun-induced dermatosis and cold exposure due to variable thermal conditions of year long outdoor work or high temperature/humidity in confined systems

**Chemical Hazard:**

Acute and chronic respiratory irritation and disease from exposure to agricultural dusts. Agricultural dusts are primarily organic (feathers, dander, microorganisms etc.), but inorganic dusts, like crystalline silica, are also found in confinement house dusts. Immunologically mediated diseases (e.g. rhino pharyngitis, atopic asthma) and hypersensitivity (immediate and delayed) reactions (e.g. extrinsic allergic alveoli is/ hypersensitivity pneumonitis) from exposure to dusts.

Acute and chronic dermal, ocular and respiratory diseases from exposure to several toxic and asphyxiating gases common especially in confinement systems including ammonia (NH3), released during microbial degradation of manure; carbon dioxide (from animal respiration, manure fermentation, and gas flame heaters; other gases include carbon monoxide, mithen, (manure decomposition and fuel combustion). Exposure to disinfectants, detergents, formaldehyde, ammonia solutions, sodium carbonate and sodium hypochlorite. Formaldehyde, a suspect carcinogen, is often used as a disinfectant in hatcheries and brooder houses(Duchaine et al., 2009).

**Biological Hazard:**

Zoonotic diseases and infections naturally transmitted between vertebrate animals and man are common. These include infective agents such as viruses, bacteria, fungi (histoplasmosis) rickettsia and other microbes (psihicosis) as well as endotoxins Ergonomic, psychosocial and organizational factors.Back pains and other musculoskeletal problems resulting from overexertion and wrong postures during lifting and moving of animals and feed bags, shoveling of wastes, etc. Poultry Farm Workers may contract, from the fowl in their care,

infectious diseases that are common to fowl and man. The atmosphere in poultry farms usually contains significant levels of agricultural dust and toxic gases, which put the workers at a health risk. Some chemicals used at poultry farms (for disinfection, etc.) may cause harm to workers' health. The Poultry Farm Worker's work is often physically difficult and involves handling heavy loads, uncomfortable postures and movements. This may cause traumas (including falls), back, arms and hands pains ( Senthilselvan et al., 2011).

**Respiratory problems:**

Many studies have shown that poultry farmers have a greater risk of respiratory problems than non-farmers. For example, results of a study showed that North Carolina poultry farm workers experienced more chronic phlegm and wheezing than non-farm workers. Another study of 22 North Carolina poultry farms showed that poultry growers and catchers were exposed to high levels of dust and ammonia. Each poultry house contains its own complex mixture of dusts and gases. Nature of this mixture is dependent on numerous factors including ventilation, type of poultry, feeding system, and waste management. Dust and gas levels are usually highest in winter. Organic dust is the most common respiratory contaminant. Organic dust is a combination of dusts with bacteria or fungi (fungal spores).Ammonia is an irritating gas present in poultry barns. The occupational threshold for ammonia is generally 25 ppm. For short-term exposure (15 minutes), the threshold is 35 ppm. An ammonia concentration of 300 ppm is immediately dangerous to life. People who have worked in poultry barns for years often can not detect levels below 50 ppm. Harmful gases in poultry houses are not limited to ammonia.

Exposure to dusts and gases results in responses in the respiratory system. These responses vary from one person to another, and may affect any part of the system. Potential responses include acute or chronic bronchitis (the most common reaction), increased airways reactivity, asthma, and chronic airway obstruction (Dr Dorothy Ngajilo., 2014).

**Preventive Measure:**

1.Wear safety shoes with non-skid soles.

2.Wear appropriate eye protection; consult a safety supervisor or a supplier.

3.Protect hands with chemical-resistant gloves; if impractical, use a barrier cream Install effective exhaust ventilation and air conditioning to prevent air contamination and heat or cold stress.

4.Wear a respirator to avoid inhalation of dust or aerosols.

5.Replace formaldehyde as a disinfectant with less harmful substitutes available on the market Maintain a high level of personal hygiene. At the end of work, shower and change clothes. Do not take work-soiled clothing home

6.Learn and use safe lifting and moving techniques for heavy or awkward loads; use mechanical aids to assist in lifting.

**1.7 Nature and Causes of Occupational Health Conditions in the Developing World:**

Despite country-to-country differences, some commonalities exist within the workforce of the developing world that are worth noting. Workforce distribution by economic sector is different from that in the industrial world. Compared with industrial countries, where single-digit percentages prevail—for example, approximately 2 percent in the United Kingdom—developing countries employ about 70 percent of their economically active population in the agricultural sector (World Bank, 2003). For many of these workers, the distinction between health at work and health at home is blurred, because health in the workplace is integrated into all aspects of daily life for these often subsistence agricultural workers. For example, pesticide poisoning is a hazard faced by workers and their families and communities.

The informal workforce, which in industrial countries is rarely larger than 10 percent of total employment, looms large in developing countries. This workforce includes self-employed, household-based unpaid labor (family members, for example) and independent service workers such as street vendors. In the developing world, employment in the informal sector

may reach 70 percent, with the contribution to the gross domestic product (GDP) ranging from 10 to 60 percent (ILO, 2002).

Informal economy workers are often unprotected in the regulatory arena even in the industrial world. This circumstance is exacerbated when the vulnerable employment status in the developing world is coupled with problems of poverty and ill health. Cottage-industry workers abound in the informal sector, and home-based work can fully blur distinctions between occupational and other environmental hazards. Not uncommon across the developing world are lead-poisoned adults who manufacture batteries in crude facilities at home and their lead-poisoned children, exposed to the lead while sleeping and playing in the next room.

The migrant workforce, which is increasing worldwide, is estimated to be 120 million (ILO, 2000). In the industrial world, immigrant workers often perform work deemed unattractive (seasonal agricultural work in the United States, service sector work in the United Kingdom), but the issues of a migrant workforce in some parts of the developing world take on even greater import. In southern Africa, for example, migrant mining workers face the extraordinary burden of risk for the triad of silicosis, tuberculosis, and HIV/AIDS—diseases that are inextricably linked to interactive determinants of workplace, housing, and social and economic factors (Trapidoat al., 1996).

Workers in the developing world face different risks in the health transition than do their counterparts in the industrial world. They may be exposed to the combined and often synergistic risks of both traditional and emerging hazards. Workers may also face unregulated and unprotected exposures to known hazards just as those same hazards—silica and asbestos, for example—were faced decades ago by millions of workers in the industrial world. A significant difference, though, is that workers in the developing world are being exposed when widespread knowledge is available about the risks and effective preventive measures (Kjellstrom, 1990).

Even as these workers are forced to replay history, despite the availability of information and knowledge transfer unthinkable just a generation ago, they face other hazards, including the production, marketing, and importation of environmental hazards such as cigarettes. In the

instance of asbestos and tobacco, both products are being aggressively marketed and exported by the industrial world (especially asbestos from Canada and tobacco from the United States) to the developing world.

A real example of hazards faced by developing workers in what might be called the risk transition is that posed by dual exposure to asbestos and cigarette smoke and risk for lung cancer. This example is especially troubling not only because the risk is dauntingly high but also because exposures to both are occurring with full knowledge of their individual and cumulative effects. In parts of China and elsewhere in the developing world, asbestos exposure abounds as cigarette smoking is rising. Effective intervention strategies will be those based on a comprehensive approach to the overall burden rather than those addressing the individual burdens of specific exposures, recognizing that organizational or institutional interventions (such as eliminating asbestos from the workplace) are far more effective than those targeting individual behaviors (such as smoking cessation).

**1.8 Global Burden of Disease from Occupational Health Risks:**

The overall picture that emerges from all parts of the developing world is one of increased health and safety risks in all occupations for which data are available.

Dramatic changes in the global labor force will occur as globalization and population growth continue to affect the global economy. For example, the labor force in Latin America and the Caribbean is one of the fastest growing in the world, with 217 million workers in 2000; the number of workers is expected to reach 270 million in 2010 (PAHO, 2002).

The burden of disease and injury attributable to workplace risks in the formal and informal sectors is grave and will continue to rise. Inadequate data and reporting systems make capturing the effect of workplace risks problematic. Nonetheless, several recent efforts by international bodies have shed some light on the staggering burden, although in general attempts to derive evidence-based estimates are likely to systematically and significantly under represent the extent of the problem.

The gravity of workplace risks is seen in the recent International Labor Organization (ILO) estimate that among the world's 2.7 billion workers, at least 2 million deaths per year are

attributable to occupational diseases and injuries. The ILO estimates for fatalities are the tip of the iceberg because data for estimating nonfatal illness and injury are not available for most of the globe. The ILO also notes that about 4 percent of the GDP is lost because of work-related diseases and injuries (Takala, 2002).

A recent effort of the World Health Organization (WHO) has provided insight into the global dimensions of several selected occupational health risks. WHO included five occupational risk factors in its comparative risk assessment in a unified framework of 26 major health risk factors contributing to the overall global burden of disease and injury (Ezzati at al., 2002, 2003; WHO 2002).

The WHO comparative approach used a common statistical model that allows a reader to compare the contribution (attributable fraction) of several risk factors to a single outcome—lung cancer, for example. Stringent requirements for consistency in describing risk factors limited the number of occupational risk factors that could be included in the study. For all risk factors, it was necessary to estimate an exposed population and exposure levels for 224 age, sex, and country groups in the 14 WHO geographic regions of the world. Where possible, data could be extrapolated to age, sex, and country groups for which data were not available, based on similarities in demographic, socioeconomic, or other relevant indicators. Because knowing the existing burden of disease and injury globally was necessary, the only outcomes included were those for which WHO had rates of disease or injury for all regions calculated by International Classification of Disease (ICD) codes. Finally, estimates of the risk factor–burden relationships by age, sex, and WHO sub region were generated. Risk measures (relative risks or mortality rates) for the health outcomes resulting from exposure to the risk factors were determined primarily from studies published in peer-reviewed journals. Adjustments were made to account for differences in levels of exposure; exposure duration; and age, sex, and sub region, as appropriate. The information about each risk factor was entered into the WHO common model for comparative analysis. The resulting burden was described as the attributable fraction of disease or injury, using mortality and disability-adjusted life years (DALYs) lost, with one DALY being equal to the loss of one healthy life year—the common currency measure that includes mortality and morbidity.

Because of the requirements for global data, only five occupational risk factors could be described: risks for injuries, carcinogens, airborne particulates, ergonomic risks for back pain, and noise. The exposed worker populations were estimated using an approach based on the International Standard Industrial Classification of All Economic Activities (ISIC), an economic classification system of the United Nations that organizes all economic activities by economic sectors and relevant sub groupings (UN, 2000).

The ISIC system is used almost universally by national and international statistical services to categorize economic activity; therefore, it allows global comparisons. The ILO has developed economically active population (EAP) estimates by applying economic activity rates, by sex and by age group (older than age 15), to the population estimates and projections of the United Nations (ILO, 1996).

The EAP provides the most comprehensive global accounting of people who may be exposed to occupational risks because it includes people in paid employment, the self-employed, and people who work to produce goods and services for their own household consumption, both in the formal and in the informal sectors (ILO, 2002).

For the WHO comparative risk assessment, the EAP was further divided into nine economic subsectors (where people work) and seven occupational categories (what type of work people do), on the basis of country-level data for 31 countries (ILO, 1995).

The absence of data in much of the developing world limited the range of occupational risk factors that WHO could measure, and the available data excluded children under age 15 who work. The WHO comparative risk assessment also excluded important occupational risks for reproductive disorders, dermatitis, infectious disease, coronary heart disease, intentional injuries, musculoskeletal disorders of the upper extremities, and most cancers. Psychosocial risk factors such as workplace stress could not be studied, nor could pesticide, heavy metal, or solvent exposures. The potential consequences of omitting just pesticides from the global burden analysis can be illustrated by the situation in Central America (PAHO, 2002).

The isthmus is primarily an agricultural and forested area of .5 million square kilometers, of which 40 percent is arable. Pesticide imports almost tripled from 15,000 metric tons in 1992 to 41,000 in 1998, and 35 percent of the pesticides were restricted in the exporting countries.

In 2000, the sub region imported some 1.5 kilograms of pesticides per inhabitant per year, a quantity 2.5 times greater than the world average estimated by WHO. Exposures in the formal and informal sectors extend to the homes and families of the pesticide workers. Although this situation is common in developing nations, the WHO comparative risk assessment captured none of these exposures.

The ILO and WHO data provide the most current, yet still incomplete, picture of the overall problem of occupational health risks. Nonetheless, with just the few occupational risk factors studied in depth by WHO a picture emerges of the significant effect of largely preventable conditions (Ezzati at al., 2004).

WHO found that occupational injuries result in about 312,000 deaths per year for the world's 2.7 billion workers; this figure contrasts to the approximately 6,000 deaths per year caused by occupational injuries for the 150 million workers in the United States. As in the industrial world, high injury fatality rates in the developing world are clustered in certain sectors, including agriculture, construction, and mining. Using this metric, occupational injuries account for more than 10 million DALYs and 8 percent of unintentional injuries worldwide.

The second occupational factor WHO analyzed was the effect of exposure to workplace lung carcinogens (such as asbestos, diesel exhaust, and silica) and leukemogens (such as benzene, ionizing radiation, and ethylene oxide). WHO concluded that occupational exposures account for about 9 percent of all cancers of the lung, trachea, and bronchus and about 2 percent of all leukemia’s. Overall, about 102,000 deaths were attributable to these two occupational cancers and about 1 million DALYs.

Estimates of the global burden of chronic lung disease demonstrate the significant contribution of occupational exposures, which account for about 13 percent of all chronic obstructive pulmonary disease (COPD) and about 11 percent of asthma. In total, WHO found the annual worldwide burden of work-related COPD to be about 318,000 deaths per year and about 3.7 million DALYs. The occupational risk contribution to the worldwide asthma burden was about 38,000 deaths and about 1.6 million DALYs, reflecting the fact that a great deal of asthma occurs at younger ages and is not fatal. WHO found that 37 percent of all back pain worldwide is attributable to work, resulting in an estimated 800,000 DALYs, a

significant loss of time from work, and a high economic loss. Worldwide, 16 percent of all hearing loss is attributable to workplace exposures, resulting in 4.2 million DALYs.

WHO made a special risk analysis of hepatitis B, hepatitis C, and HIV infections among health care workers caused by contaminated sharps, such as syringe needles, scalpels, and broken glass. This analysis illustrates the general problem of high risks existing in the small worker population having exposure. WHO found that, among the 35 million health workers worldwide, there were 3 million percutaneous exposures to blood borne pathogens in 2000. This finding is equivalent to between 0.1 and 4.7 sharps injuries per year per health worker. WHO concluded that of all the hepatitis B and hepatitis C present in health care workers, about 40 percent was caused by sharps injuries, with wide regional variation. WHO also found that between 1 and 12 percent of HIV infections in health care workers was caused by sharps injuries. The comparative risk assessment by region and type of infection indicates where special emphasis is needed. Clearly, solutions exist to these problems, as shown by the countries that have engaged in serious prevention efforts. Proper needle handling and waste management, substitutions for sharps, hepatitis B virus (HBV) immunization, post exposure prophylaxis, training, and legislative measures have been successful. Beyond the personal and workplace consequences, the potentially devastating societal impact of loss of this critical worker group can be anticipated if prevention measures are not ensured in developing countries, where the proportion of health care workers in the population is already small (WHO, 2002).

Fraction of Hepatitis C Virus, Hepatitis B Virus, and HIV Infections in Health Care Workers Attributable to Injuries with Contaminated Sharps, Ages 20 to 65. In total, the few occupational risk factors considered here were responsible for about 800,000 deaths worldwide in 2000. Not considered by WHO because of lack of global data are the additional 1.2 million deaths that ILO estimated are attributable to work-related risks (Takala, 2002).

The leading occupational cause of death was unintentional injuries, followed by COPD and lung cancer. Workers who developed outcomes related to these occupational risk factors lost about 25 million years of healthy life. Among the occupational factors analyzed in this study, injuries, hearing loss, and COPD accounted for about 80 percent of years of healthy life lost. Low back pain and hearing do not directly produce premature mortality, but they do result in

substantial disability. This feature differentiates these conditions from the others analyzed in the study.

The WHO comparative risk assessment has accounted for only about 800,000 (40 percent) of the 2 million deaths estimated by ILO to occur each year because of occupational illness and injury. Deaths attributable to a wide range of occupational exposures could not be included because of the strict requirements for global data. Missing are deaths attributable to asbestosis, silicosis, and other dust diseases; infectious diseases; cardiovascular diseases; and violence. Deaths attributable to workplace exposures to pesticides, heavy metals, solvents, and other chemicals are not included. Outcomes such as dermatitis, psychological disorders, and upper-extremity musculoskeletal disorders that cause little mortality but substantial disability are also not captured by the WHO comparative risk analysis. Additionally, the consequences of underreporting in existing systems and the dearth of record-keeping systems in the developing nations lead to substantial undercounting by both the ILO and WHO. Nonetheless, the analyses provide important insights into the immense global burden of disease and injury attributable to occupational risk factors. (Rosenstock at al., 2006).

Workers in Bangladesh are facing many types of health problems due to their work environment. Garments worker, mill worker, textile worker, construction worker all are focused in this survey and all of them face health problems due to their work nature as well as work environment.

**1.9 Interventions:**

Strategies for controlling injury and occupational disease, developed by industrial hygienists and others over many decades in industrial countries, are as fully applicable in developing countries. The strategies include a hierarchy of controls in the following decreasing order of preference: substituting major hazards for less hazardous materials or processes; applying engineering controls to separate workers from hazards that remain; using administrative controls to minimize contact uncontrollable by engineering; and, as the last line of defense, using personal protective equipment such as respirators and protective garments. What differs in developing countries is the context in which the paradigm must be applied. Options are often sharply limited, and knowledge of them even more so; economic and political

factors may impede otherwise obvious or desirable solutions; and the differing workplace context may demand that attention be paid to certain problems and concerns that would not be relevant in industrial countries in temperate climates.

The following generic factors associated with work in developing countries may alter industrial hygiene practice and must be considered in every effort to intervene to improve working conditions and occupational health:

>Access to industrial hygiene consultation is limited; professionals, sampling equipment, and laboratories are all in short supply.

>Knowledge level about occupational health among managers and workers is often limited.

>Markets for production materials as well as safety equipment may be limited and may include more hazardous materials or less effective protective equipment "dumped" from industrial countries where they are no longer marketable (Hecker 1991; Ives 1985; Jeyaratnam 1990).

>Regional conflict, economic pressures, climatologic factors and lack of foreign exchange may make otherwise straightforward choices impractical.

>Supply of labor is often high, as is turnover, so economic incentives for investment in health capital are lower than in industrial countries.

**1.10 Strategies for Improving Working Conditions:**

With these differences in context in mind, we now consider the major types of intervention: international, national, workplace, and individual.

**1.1 International Interventions:**

The ILO–WHO Joint Committee on Occupational Health was formed in 1950 to provide guidance to the ILO and WHO regarding international occupational health issues. The committee meets periodically. At its 13th session, held in December 2003, the committee recommended that WHO and ILO pursue the following priorities (ILO and WHO, 2003).

>Guide and support national occupational safety and health programs. Such guidance and support includes providing models for organizing at national or sub national levels; providing basic occupational health services; promoting management systems and tools, including control banding; developing national profiles and indicators; assessing the cost-effectiveness of interventions; and establishing effective enforcement agencies.

>Enhance regional collaboration and coordination, including the development and dissemination of models for cooperation, such as the African Joint Effort.

>Coordinate and enhance information and educational programs and materials (for example, by developing a joint Internet-based global portal) and statistics.

>Provide awareness-raising activities and instruments through campaigns, events, and special days.

**1.12 State or Government Interventions:**

The major role the government can play is to establish workplace rules and provide a system of dissemination and enforcement. Evidence from industrial countries is overwhelming that conditions are substantially improved when both a strong regulatory framework and enforcement are achieved. An added benefit of government, rather than private sector, control is to "level the playing field": all employers in an economic sector carry the same burden. Conversely, improved health of the workforce, achieved by developing strategies beyond the minimum required, could be used to confer competitive advantages, a message to reluctant employers that has been used in different parts of the world with some success.

Regulatory decisions, such as the choice of exposure limits or allowable practices, often stimulate the biggest discussion—for example, the debate about dust levels to be allowed in South African mines—but the larger issue for most countries is garnering resources to ensure compliance, to attract adequately trained personnel to conduct inspections, and to establish and monitor laboratories to support regulatory efforts. The most stringent exposure levels (often referred to as threshold limit values or TLVs) are useless if the offending hazard cannot be routinely and accurately measured. Indeed, the South African experience, despite the presence of excellent regulations, is not encouraging in this regard (Joubert, 2002).

Other forms of government intervention may indirectly improve working conditions. Among these are workers' compensation regulations and stipulations that employers of certain sizes must engage professionals in health and safety (most often nurses). Each of these interventions has the advantage of stimulating certain behaviors and practices without requiring the government to maintain the elaborate and technically complex machinery required for direct monitoring of workplace conditions.

Constraints on governmental regulatory and other interventions are many. Occupational and environmental regulations are often perceived as burdensome costs that impede investment and growth, perhaps creating what has been referred to as "the race to the bottom," in which threat of out-migration of industry from one jurisdiction enhances reluctance to regulate or enforce control strategies (Frumkin, 1999). Moreover, the costs to the government itself, notwithstanding technical support from such agencies as the ILO, may be considerable in terms of personnel and equipment, and occupational health has to compete with other public health priorities for scarce resources. The result may be the promulgation of minimal standards or emasculated enforcement of those that already exist. The general impression of those working throughout the developing world is that the level of regulation and enforcement is woefully inadequate compared with that in industrial countries. Detailed case examples from Brazil (Bedrikow , 1997); Kenya (Mbakaya and others 1999); Nigeria (Asuzu, 1996); and Taiwan, China (Chen and Huang, 1997), underscore the ubiquity of this problem. Bangladesh Government need to take initiative like above experience.

**1.13 Workplace-based Interventions:**

Issues beyond the economic and legal ones impede application of the principles of industrial hygiene. A primary factor is ignorance; many employers may be uninformed about available controls and their value. Insurance agencies, local safety groups, and—in some regions of the world—trade unions may serve as facilitators of positive influence. In general, however, such resources fall short of the benefit of on-site industrial hygiene expertise that is lacking in many regions of the world.

Economic factors often impede efforts to institute voluntary controls. Materials used are frequently far cheaper than safer substitutes, often precisely because these materials no

longer have markets in industrial countries that have banned or restricted their use—for example, solvent mixtures containing benzene and construction materials containing asbestos. Similarly, equipment such as machines that are well guarded to prevent injury or well baffled to limit noise may be prohibitively expensive in a marketplace geared to "hand-me-downs" compared with respirators or gloves. Unfortunately, even these last lines of defense may be difficult to obtain or relatively expensive unless local suppliers are available.

The single strategy for which no compelling economic disincentive exists—training—may also be difficult. Through the efforts of the ILO and numerous nongovernmental organizations and with widening access to the Internet, vast resources have become available. Ample documentation from the industrial and developing world indicates that even rudimentary knowledge by supervisors and workers about risks and risk-prevention measures is beneficial. Major impediments remain, however, such as educational proficiency, language barriers, and the applicability of training materials—often developed in other contexts—to local situations. Thus, for example, although the ILO has recently reported success with information programs in rural Thailand (Kawakami and Kogi 2001), a report from Ghana (Smith-Jackson at al., 2002) suggests that workers and supervisors were unable to correctly interpret four of the most common warning signs used for hazard identification, despite having been trained in their use. Worker training appears, on the whole, widely underused.

Problems of infections in patients and health care workers from reused needles and needle stick injuries have prompted the international organizations to develop model interventions that can be transferred elsewhere. WHO initiated Project Focus: Ensuring Immunization Safety in Burkina Faso in July 2002 as a pilot project to use WHO materials in a focused effort to address all issues related to injection and immunization safety: availability of equipment and supplies (auto-disposable syringes, safety boxes, incinerators); safe injection practices; safe vaccine delivery; and safe waste management (WHO, 2002). In 2000, WHO conducted a survey to assess the safety of injections in a study group of a random sample of 80 health centers. The situation was reassessed in June 2003 to evaluate the use of safety boxes (which had been provided in a WHO immunization campaign in Burkina Faso in 2001) and the impact of Project Focus. Dramatic reductions were found in needle recapping,

needle stick injuries, and misuse of safety boxes. Additionally, the number of clinics using safety boxes increased from fewer than half to 86 percent.

### 1.14 Individual Interventions:

The general principle that, for most public health intervention, organization-level change is more effective than strategies targeting the individual is even more true when it comes to the workplace. With the exception of self-employed workers, such as those in the informal sector and subsistence farmers, occupational health and safety does not lend itself readily to individual solutions, with the same factors limiting employees more likely to limit individuals

### 1.15 Improvement of Access to Health Care:

In a few developing countries, workers enjoy broad access to high-quality health care. Chile, for example, has a system of nonprofit employer mutual associations that provide advice on reducing risks in workplaces and medical treatment and sick pay for work-related illness and injury (Contreras and Drummer 1997). In most countries, the role of on-site services is generally limited to emergency services for an injury or accidental overexposure and the conduct of medical surveillance examinations for workers at risk for chronic conditions such as noise-induced hearing loss, pneumoconiosis, or cancer.

In the developing world, access to health care is critical both for work-related and other health issues. In many areas, especially remote or rural areas, on-site service may be the only health care services available to workers and their families. Moreover, the blurred distinction between "general health" and "occupational health" in societies where people live and work in the same community and environment, and where children and spouses of workers may share common exposures and adverse conditions with workers, serves to confer some advantage to a more holistic approach to health services often best provided at or near the workplace itself.

### 1.16 Control of Non occupational Exposures:

In industrial countries, a sharp demarcation exists between environmental risks associated with work and those associated with home life. This differentiation is not the case in many developing countries, especially at large, remote industrial complexes and farms. Workers—with or without their families—often cohabit with the workplace—and often with many or all of its risks, including noise, chemicals, and biohazards. The most dramatic examples of this situation were the industrial disasters at Chernobyl and Bhopal. It is not just in disaster, however, that risk occurs. Pesticides, for example, result in hundreds of thousands of cases of poisoning a year, a high fraction from the misuse of farm chemicals for nonwork applications, such as the appropriation of empty (but not clean) drums for transporting water or other household goods, a disturbingly common practice. In the industrial setting, carcinogens, neurotoxins, and other hazardous chemicals often pollute homes, drinking supplies, and common areas for recreation on a daily basis, adding to the exposure of workers and placing nonworking family members at risk from what would normally be seen as workplace hazards.

The remedy is often complex and beyond traditional industrial hygiene practice. Housing, which in any event may be substandard, needs to be modified to exclude the possibility of contamination by effluent from farm or factory under any foreseeable circumstances. Children and family members need to be apprised of the hazards of all materials used for work and prevented from even accidental access, a situation complicated by the fact that children are themselves often inappropriately engaged in the workplace. Food and water supplies need to be secure and protected from cross-contamination, a particular problem in the farm setting.

### 1.17 Surveillance and Reporting:

Even in industrial countries, the strategies for recording any aspect of workplace harm beyond acute injury has been an issue; in most developing countries, even injury reports are largely nonexistent. Still, broad agreement exists on the value of statistical summaries of occurrences.

Unfortunately, a strong disincentive exists for such reporting unless it is required by law or by a parent company (as in the case of some multinationals). If reporting is required, as in the formal laws of many countries, successful implementation calls for resources for systematic

review, verification, and maintenance of the information. Even records whose limitations are otherwise legion, such as workers' compensation records or regional reporting schemes, have proven highly advantageous to control efforts in industrial countries. These, too, have a role in developing countries, helping target even rudimentary and limited control efforts.

**1.18 Capacity Building:**

Human capital in the form of professional capacity is critical to improving working conditions. Professional capacity varies greatly in developing nations but is higher where recognition of the field is high and the need for professionals and for workplace expertise is driven by occupational safety and health legislation and enforcement. In Malaysia, for example, four decades of rapid industrialization have included a series of legislative acts; development of federal agencies; and inclusion of training at various levels in occupational health in universities, the public sector, and the private sector (Rampal and Jefferelli 2002). Key international events, such as joining the WTO, encourage the development of an economic culture that better recognizes the value of safe workplaces. Enforcement of national regulations, adoption of International Standards Organization standards, and establishment of management systems lead to broadening of training for workers and managers, although the scarcity of trained professionals is a major obstacle to adequately implementing regulations and policies and providing occupational health services (Christiani at al., 2002).

In countries with some capacity, the expertise tends to be medical, rather than in other areas, such as industrial hygiene, engineering, or ergonomics. In most countries, ministries of health and of labor have jurisdiction over working conditions but often have too few experts and inadequate coordination. Moreover, the large percentage of work conducted in the informal sector presents a special challenge to these ministries. Because globalization has brought the need for professionals in occupational health to a crisis level, it is appropriate for international trade and development bodies to support national and international capacity-building programs.

In 1970, when the United States enacted the Occupational Safety and Health Act that established the National Institute for Occupational Safety and Health (NIOSH), the country had little professional capacity in that field. The new law charged NIOSH with ensuring an adequate number of trained professionals and accomplished this task successfully by funding

graduate programs in U.S. universities. A follow-up 25 years later found that 90 percent of NIOSH-supported trainees pursued careers in the field, with more than 50 percent working in private organizations and the balance in government and academia (U.S. DHHS 1996a). Similar results could be achieved by a determined, large-scale effort focused on assisting developing countries in achieving adequate professional capacity.

Both infrastructure and programs are necessary to build adequate capacity. In the international arena, a number of successful coalitions exist that provide experienced institutions and individuals. The WHO Global Network of Collaborating Centers in Occupational Health is a strong international coalition of 70 national, governmental, and academic centers of occupational health that work together with WHO and ILO headquarters and regional offices and three international nongovernmental organizations: the International Commission on Occupational Health, the International Occupational Hygiene Association, and the International Ergonomics Association (Fingerhut and Kortum-Margot, 2002). These partners, located in approximately 40 countries, work together in 15 priority areas within a 2001–2005 Work Plan. More than 300 projects are under way, independently or jointly, to benefit workers in developing and industrializing nations in about 15 priority areas (WHO, 2003).

Another strong regional coalition, coordinated with and benefiting from the Global Network of Collaborating Centers, is the WHO–ILO Joint Effort on Occupational Health and Safety in Africa (WHO and ILO, 2002). This partnering coalition—where centers outside Africa assist African partners—includes individual occupational safety and health professionals, employers, labor unions, and governmental and academic institutions in all countries in Africa.

Enlarging small but successful existing programs is one approach to capacity building. The U.S. National Institutes of Health Fogarty International Center, NIOSH, and the National Institute of Environmental Health Sciences sponsor a successful program, International Training and Research in Occupational and Environmental Health, which has developed small but strong programs between U.S. universities and institutions in more than 30 developing nations (NIH, 2003).

Capacity building requires high-quality educational opportunities. Advances in information technology over the past decade are revolutionizing methods of education, and universities

worldwide are developing large numbers of Internet-based courses. Fostering access of students from developing nations to these courses in leading universities is now feasible, but a national or international program is needed to address issues such as tuition, competition, intellectual property, and degree requirements. This effort might be called Access to Universities, following the model WHO program Access to Biomedical Journals, through which WHO and the world's largest medical journal publishers have provided about 100 developing countries with Internet access to journals at no cost or at deeply reduced rates (WHO, 2001).

Professional associations have a long history of assisting in capacity building through training, research, and conferences. Recently, when the University of Witwatersrand in Johannesburg developed the first Diploma Occupational Hygiene program in South Africa, the country had too few industrial hygienists to provide mentors for the field research of the graduate students. The American Conference of Governmental Industrial Hygienists responded to a request of the International Occupational Hygiene Association, and 11 U.S. industrial hygienists volunteered to be occupational hygiene field practitioner long-distance mentors for the incoming students during the 2003 course year. This approach will continue until there are adequate industrial hygienists in country to serve as mentors to future classes (WHO and ILO, 2002).

The U.K. Health and Safety Executive developed a model program that provides clear solutions to chemical control problems in workplaces. This Web-based, user-friendly product was launched to enable small business owners in the United Kingdom to use information from the suppliers of chemicals to proceed through a series of simple steps to identify practical control solutions that reduce worker exposures to levels that present no danger to health (U.K.HSE, 2002). The approach has gained momentum through adoption by the International Program on Chemical Safety and through formation of an international workgroup to advance the approach in developing nations. To enable global use of this approach, the ILO has translated the U.K.-specific system into a product called the ILO Chemical Control Banding Toolkit (ILO, 2003). (Rosenstock at al, 2006)

# Chapter 2

# Literature Review

**2.1 A study of occupational health hazards among assuit spinning factory workers:**

Cotton industry workers are exposed to various hazards in the different departments of textile factories. The major health problems associated with cotton dust are respiratory problems. The aims of the work are study the occupational health hazards among the workers in Assiut Spinning Factory and to assess the different protective measures used during working day to prevent the different hazards. This study was conducted in Assiut Spinning Factory. The total number of the studied sample was 550 workers out of 650 who worked in the productive and repair sectors. A questionnaire was constructed include two parts, one to assess the industrial hazards and their preventive measures and the second one included the information from the health record of the worker in Health Insurance included pre-placement examination and periodic medical examination. The data collection took about 6 months (from July to the end of December 2001).

The present study showed that the prevalence of respiratory symptoms significantly increased in some departments as blending & picking, spinning & carding and combing & twisting as these departments had high dust concentration than other departments. These agree with many studies conducted in Assiut by El-Shinawi et al., (1994), who reported that respiratory symptoms increase in preparatory and spinning departments (cough 26.1%, 24.7% respectively, dyspnea 12.3%, 11.1% respectively and chest tight 6.9%, 6.5% respectively), in Alexandria by Ahmad (1988) who reported that 67.7% and 58.8% of workers who working in Bale opening and spinning departments respectively suffer from chest symptoms and also in Ethiopia by Fantahum and Abebe (1999) who reported that respiratory symptoms increase in spinning department (59.7%).

According to periodic medical examination of the workers in Assiut Spinning Factory from Health Insurance records, the workers who were performed medical examination were 63.8% only from the studied sample. As regard to respiratory diseases it was reported that 13.4% were chronic bronchitis, 11.1% were chronic bronchitis with emphysema and 2.3% were bronchial asthma. These results are agree with many researches done by El-Shinawi et al., (1994) who reported that 6.3% were chronic bronchitis, 4.8% were bronchial asthma, Hafez et al., (1998) who reported that 11.3% were chronic bronchitis, 5.3% were bronchial asthma and 7.3% were chest tightness (Ahasan et al., 2000) who reported that 5.7% were chronic

bronchitis and 4.3% were chest tightness (Fishwick et al., 1996) and (Raza et al., 1999) who reported that the prevalence of chest disease attributed to the exposure to cotton dust

**2.2 Health Status of Textile Industry Workers:**

The current study by Zorawar Singh was carried out in two textile based industries in Ludhiana city, Punjab, India. To assess the health problems prevailing among the workers, two questionnaires were developed. First questionnaire comprised of questions related to their demography and dietary habits. Second questionnaire was about the prevalence of different health problems among them. Data was subjected to statistical analyses for confounders. Textile industry workers were found to have an elevated risk to develop various health related problems including cough, cold, depression, headaches, sleep disturbances and skin allergies. Different health problems were also found to be positively correlated with duration of exposure, smoking, alcohol drinking, tobacco chewing and dietary pattern. The study showed that the textile industry workers exposed to dyes, solvents and fibre dusts are more prone to different health related problems.

Among textile industry workers was formulated as per the reported problems. Questions about loss of appetite, skin allergies, respiratory ailments (including cough and asthmatic condition), headaches, depression, sleep disturbances, weakness, hypertension and other ailments were designed

Workers taking minimum of 30ml alcohol per day were considered as drinkers. Under this criteria, 12 subjects (30%) were found out to be smokers and 28 (70%) were categorized as non- smokers whereas 11 (27.5%) were drinkers and 29 (72.5%) were found to be non-drinkers. In case of tobacco chewing, 8 workers (20%) were identified as tobacco chewers whereas 32 workers (80%) were not using tobacco in any form (Table 1, Figure 3). Only 25% (N = 10) workers were found to be taking fruits in an adequate amount required by a normal human body whereas 67.5% (N = 27) workers were found to be taking fruits in a moderate amount. 7.5% workers were found to be taking fruits in a very less amount (N = 3).

Responses were from drinker and non-drinker groups. 40 and 108 overall responses were recorded for smokers and non- smokers. 32 positive responses were given by tobacco chewers whereas 116 positive responses were by workers who were not using tobacco.

In the present study a group of 40 workers was questioned for their health related problems. Table 2 shows the overall response of the workers to all the 17 health related problems. A total of 148 positive responses were recorded from the group, out of which 58 and 90 responses for different health problems were from workers on the basis of dietary habits viz. vegetarians and non-vegetarians. Whereas 34 and 114

Overall average response for all the 17 health parameters assessed with respect to different exposure groups. Linear forecast trend line shows the increasing trend over the next two exposure groups.

The most frequent health problem among workers came out to be headache (27 responses out of 40). The second most prevalent problem was found out to be cough (19 responses).

Then came depression during the working hours (18 responses). With 18 responses, dryness of mouth stood parallel to depression as per the score counts. All the health related problems with their response frequency has been given in the figure 6.

There were several health related problems including loss of appetite (LA), fatigue (FT), nausea (NS) and diabetes (DB) which scored a zero in the questionnaire round (zero responses). All the health problems were found for their individual correlation with confounding factors including DOE, alcohol drinking, tobacco chewing, smoking, non-vegetarian diet and fruit intake (Table 3). Dryness of mouth (MD), depression (DP), asthma (AS) and sleep disturbances (SD) were found to have a positive correlation with duration of exposure ($p = 0.006$, 0.009, 0.000 and 0.029 respectively). Similarly, asthma (AS) and weakness (WK) were found to be positively correlated with alcohol intake ($p = 0.007$ and 0.022). Skin problems were found to be associated with tobacco chewing ($R = 0.315$; $p = 0.048$). A significant positive correlation was found between asthma (AS) and smoking ($R = 0.378$; $p = 0.016$). Memory loss has been found to be correlated with the diet pattern ($R = 0.302$) but the correlation failed to reach statistical significance $p = 0.059$ (Zorawar Singh, august 2015).

## 2.3 Occupational Health Hazards In Garment Sector:

Nahar et al. (2010) analyzed the types and extent of occupational health hazards of the garment workers as well as the relationship of various health hazards with the age of the workers and the length of work in garments. Three garment factories from Konabari upazila under Gazipur district were selected purposively. The sample consisted of 90 workers taking 30 randomly from each of the three garment factories. Data were collected through personal interviews with the selected samples. It was found that work in the garment factory severely affected worker's health, as they were confined in a closed environment. In the study area the particular nature of work in Readymade Garments created various types of health hazards among the selected respondents such as headache, malnutrition, musculoskeletal pain, eye strain, less appetite, chest pain, fainting, diarrheal disease, hepatitis (jaundice), food poisoning, asthma, fungal infection, helminthiasis, dermatitis. Results of the study showed that the highest 95.6 percent of the workers reported that they were affected by headache. In total 90, 58.89 percent respondents implied that their extent of headache was severe. 52.22 percent of the respondents opined that they suffered from severe malnutrition, followed by 78.89 percent by musculoskeletal pain, 72.22 percent by eye strain, 68.89 percent by malnutrition, respectively.

The longer duration of time during which a worker is exposed to a certain hazardous agent may greatly increased the health hazards of the workers involved in garments. On the other hand reduction of time during which a worker is exposed to a certain hazardous agent may reduce the health hazards. This can be achieved through work practices, rotation of worker or administrative control. Among the ninety respondents, 58.89 percent respondents implied that their extent of headache was severe. 52.22 percent respondents implied that their malnutrition was severe due to over time, not to take meal at appropriate time, overload of work etc. Besides, that worker who was involved in garments for a long period of time, their malnutrition problem was severe and vice versa. The respondents replied that both of the diseases were existed among the garments workers and those who were involved in the garments sector for a long period of time, the diseases were severe. It is commonly related to poor sanitation and poor socioeconomic status. 45.56 percent respondents mentioned that they had diarrheal diseases in severe condition. 36.67 percent replied that they had not

affected by diarrheal diseases yet and the amount of absenteeism of diarrheal diseases was high on those who were involved in the garments sector less than two years. Asthma is a Chronic Obstructive Pulmonary Disease (COPD) because it progress very slowly over many years. It is commonly occurred due to inhalation of dust particle which causes chronic irritation of lungs. Asthma is commonly related to garments industry due to production of excessive dust like, cotton during preparation and handling of garments product. It is clear that asthma is related with length of work. 41.11 percent responded that the extent of asthma is severe for them and it also depends on length of work. The explanation is same for fungal infection, helminthiasis and dermatitis. These three diseases were closely related to length of work. Those who had less work experience the existence of these disease was absence on the other hand who involved in the garments sector for a long time the existence of these diseases was severe (Nahar et al, 2010).

**2.4 Health Status of Workers Engaged in the Small-scale Garment Industry:**

Another study on garments workers conducted in India by Tushar et al. (2010), where the sociodemographic profile of the study population shows that most of the workers were males (76.79%) and were in the 15-45 age-group (80.36%), with none below 14 years of age. It was found that 23.21% of the workers were illiterate and most of them belonged to poor socioeconomic status.

Occupational and sociodemographic correlates of musculoskeletal morbidity among the workers in the garment industry (n = 112).

The average monthly per capita income was Rs. 500-1000. Addiction was rampant that is more than two-thirds (66.07%) of the workers were addicted to one or more substances i.e. tobacco (37.50%), alcohol (12.50%) and both (16.07%).

On enquiring about their chief complaints we found that musculoskeletal problems (69.64%) were the commonest health problem. The body areas commonly affected was neck (64.10%), low back (41.03%), hand, wrist, finger, and shoulder. The common symptoms in these subjects were pain (69.23%), weakness (38.46%), and stiffness (23.08%) of the affected parts.

The other morbidities that we detected were generalized weakness (14.29%), acidity and heart burn (26.79%), menstrual problems (5.36%), insomnia (21.43%), problems with vision

(12.05%), skin diseases (25%), injury (9.82%), anemia (8.93%), angular stomatitis (14.29%), pedal edema (7.14%), hypertension (16.07%), malnutrition (37.50%), swelling of feet, cough and cold, loose motion, fever, and pain abdomen.

Musculoskeletal morbidity was more common among older (>45 years) workers than in younger (<45 years) ones (77.27% vs. 67.78%), in females as compared to males (76.93% vs. 67.44%), in illiterate workers as compared to those who were literate (75.08% vs. 68.60%), and in substance abusers as compared to those who had no history of substance abuse (74.32% vs. 60.53%); however, none of these differences were statistically significant.

It was also observed that musculoskeletal disorders were more common among those who had worked for more number of years (>10 years) ($\chi 2 = 16.94$; $P = 0.0002$, $df = 2$), worked for longer hours (>10 h/day) ($\chi 2 = 12.67$; $P = 0.0018$, $df = 2$), and in those who were engaged in cutting and sewing ($\chi 2 = 6.38$; $P = 0.0412$, $df = 2$). All these differences were statistically significant.

Two Focus Group Discussion were organized to elicit evidence of social, family, and personal problems. Most of the workers were Muslims who had migrated from their rural ancestral homes in Bihar to this urban slum, which is the largest slum in Kolkata. Here, they were working under tekhedaars, (labor contractors) and were paid according to the number of finished goods. There was no fixed remuneration and when they fell sick they lost precious hours of work and therefore money. On the other hand, many workers took on extra work so that they could earn more money, even if the heavy workload was detrimental to their health.

The workers complained of low wages, long working hours, no relaxation time, and lack of cooperation of the employer because they were never allowed to go on leave even when they were sick and no financial help was given even if there was an emergency in the family. They were also very dissatisfied with the health care service; though the Urban Health Center under the All India Institute of Hygiene & Public Health (AIIH&PH), Kolkata, was available to cater to their health needs, the OPD timings of this center were inconvenient because it clashed with their working hours. Some of the workers suggested that since their homes were their place of work, health care service delivered at their homes would be of great help. Some felt that medical insurance for them and their families would be useful (Tushar,*et all* 2010).

## 2.5 Environmental and organizational factors associated with elbow/forearm and hand/wrist disorder among sewing machine operators of garment industry in Ethiopia:

Kebede et al. (2014) showed, occupational health problems related to upper limp musculoskeletal disorders were the major issue among sewing machine operators of garment industries in Ethiopia. A cross-sectional study was conducted from April 1 to 30, 2012 to find out the prevalence and associated risk factors of work related elbow and wrist musculoskeletal disorders among sewing machine operators of garment industries in Galan City, Oromia Regional State. A total of 422 study subjects were included in this study. Standard Nordic Musculoskeletal Questionnaire was used to collect detailed information on musculoskeletal symptom, sociodemographic data, and factors associated with the problems through face to face interview. From a total of 422 sewing machine operators included in the study 370 (87.7%) were females and 306 (72.5%) were in the age group of <30 years. The prevalence of self-reported work related elbow and wrist musculoskeletal disorders was 40% and 37.7%, respectively. In multivariate analysis, those who had >16 years of service were about five times more likely to develop elbow and wrist musculoskeletal disorders than those who had short (1-5 years) year of services [AOR = 4.7, 95% CI: 1.55-13.02], physical activities [AOR = 5.02, 95% CI: 1.57-16.00], and methods of payment [AOR = 2.01, 95% CI: 1.23-3.28], factors significantly associated with this disorders. Work related elbow and wrist musculoskeletal disorders were high among sewing machine operators in selected garment industries. Moreover, personal and environmental factors were identified as the potential risk factors related to elbow and wrist musculoskeletal disorders among the study group. Therefore, government and the owner of the garment industries should give special attention to prevent and control the problems through proper occupational health and safety policy implementation in the country (Kebede, 2014).

**2.6 Respiratory disorders and atopy in cotton, wool, and clothes:**

Sigsgaard et al. (1992) conducted a cross-sectional study of respiratory disorders and atopy in Danish textile industry workers was conducted to survey respiratory symptoms throughout the textile industry, to estimate the association of these disorders with atopy, and to study dose-response relationships within the cotton industry. Workers at cotton mills, a wool mill, and a man-made fiber (MMF) mill were examined. Four hundred nine (90%) of the 445 workers participated in this survey, i.e., 253, 62, and 94 workers at the cotton mills, the wool mill, and the MMF mill, respectively. An interview designed to assess the prevalence of common respiratory and allergic symptoms was given to all workers willing to participate, and blood samples were drawn. Lung function measurements determined a baseline FEV1, FVC and the change in FEV1 and FVC during work hours on a Monday. The working environment was examined for dust, bacteria, endotoxins, and molds, and the exposure was estimated for each participant. The mean personal samples of airborne respirable dust and respirable endotoxin were highest in the cotton industry, i.e., 0.17-0.50 mg/m3 and 9.0-126 ng/m3 respectively, whereas mold spores were found in the highest concentrations in the wool mill: 280-791 colony-forming units (cfu)/m3. Only small concentrations of microorganisms were found in the MMF mill. The mean change in FEV1% and FVC% was greatest among atopic individuals in both cotton and wool industry and other textile industries although the differences were not significant. FEV1% and FVC% in the cotton workers were significantly associated with the cumulative exposure to respirable endotoxin. Byssinosis was diagnosed only in the cotton industry. We found a dose-response relationship between endotoxin exposure and byssinosis, and a significant association between A-1-A serum concentrations less than or equal to 35 mumol/liter and byssinosis, a finding we are further evaluating in subsequent studies (Sigsgaard, 1992).

**2.7 Respiratory disease in garments, textile like spinning mills workers :**

A cross-sectional study by Hayes et al. (1994) of 705 textile workers in two cotton mills and one silk mill in Shanghai, People's Republic of China, to assess small airway function among cotton textile workers and to compare the FEV1 to the FEF25-75 in detecting airflow obstruction in these workers. All workers had at least 2 years of work experience. Environmental sampling was performed with vertical elutriators and revealed that in the

cotton mills mean elutriated dust levels were 1.07 +/- 0.23 mg/m3 in mill 1 and 1.01 mg/m3 +/- 0.24 mg/m3 in mill 2. Mean endotoxin levels were 332 +/- 83 ng/m3 in mill 1 and 101 +/- 46 ng/m3 in mill 2. No differences were found in preshift FEV1 or FEF25-75 between cotton and silk workers. Cotton workers had significantly greater declines than silk workers in FEV1 across a work shift, but not in FEF25-75. These acute changes in FEV1 were noted in both byssinotic and nonbyssinotic workers. Although cotton dust may affect both large and small airways, spirometric measures of small airway function (e.g., FEF25-75) add little to the FEV1 and FVC in detecting airflow limitation in cotton dust-exposed workers (Hayes, 1994).

**2.8 The prevalence of byssinosis among cotton workers in the north of Benin**

In a cross-sectional study by Hinson et al. (2014) among cotton workers in the north of Benin, 109 workers exposed to cotton dust and 107 unexposed workers were studied. The International Commission on Occupational Health (ICOH) questionnaire was used for data collection on respiratory symptoms. For each worker, crossshift pulmonary function was performed with a dry spirometer. Based on the severity of respiratory symptoms and spirometry byssinosis was defined and classified according to the criteria of Schilling, et al. The mean ± SD age of the exposed and unexposed workers was 46.3 ± 7.8 and 37.0 ± 8.3 years, respectively ($p<0.001$). The mean FEV1 predicted value for the exposed and unexposed workers was 76.3% and 77.3%, respectively. The prevalence of grade 3 byssinosis was 21.1% (95% CI: 13.4-28.9) in exposed workers and 8.4% (95% CI: 3.1-13.7) in unexposed workers ($p=0.006$). On Mondays, the exposed workers had more respiratory symptoms than unexposed workers; for grade 3 byssinosis, the prevalence was 13.8% in exposed and 4.7% in unexposed workers ($p=0.011$). The prevalence of respiratory symptoms and byssinosis among cotton mill workers in Benin is high and needs prompt attention of health care workers and policymakers (Hinson 2014)

Nafees et al., (2013) conducted a cross-sectional survey of 372 adult male textile workers from the spinning and weaving sections of 15 textile mills from Karachi. Data were collected from November to December 2009 through a structured, pretested questionnaire and spirometry. Prevalence of byssinosis was 10.5%, chronic cough 7.5%, chronic phlegm 12.9%, wheeze with shortness of breath 22.3%, shortness of breath (grade 2) 21%, chest

tightness ever 33.3%; whereas, a low prevalence of asthma (4%) was identified in this population. Eight per cent had obstructive, 8% restrictive and 2% mixed pattern of lung function abnormality. After controlling for potential confounders, work in the spinning section predicts frequent wheeze (AOR=2.0; 95% CI 1.1 to 3.5), wheeze with shortness of breath (AOR=1.8; 95% CI 1.0 to 3.4), and obstructive pattern on spirometry (AOR=2.5; 95% CI 1.0 to 6.2). Prolonged duration of work predicts breathlessness grade 1 (AOR=1.8; 95% CI 1.0 to 3.1) and grade 2 (AOR=2.7; 95% CI 1.3 to 5.4), as well as decrements in Forced Expiratory Volume in the first second (FEV(1)) and FEV(1)/Forced Vital Capacity ratio. Lack of education predicts frequent wheeze (AOR=2.0; 95% CI 1.2 to 3.3), and Sindhi ethnicity predicts chest tightness apart from during cold (AOR=2.7; 95% CI 1.1 to 6.6). This study highlights the burden of respiratory illnesses and symptoms, and a low prevalence of asthma among textile workers in Karachi. Work in the spinning section, lack of education, prolonged duration of work and Sindhi ethnicity, were identified as important risk factors.

A study describes the frequency of occurrence of work-related injuries and musculoskeletal disorders (MSDs) among factory workers in Shenzhen, China, by Yu W et al. (2013) and examines the determinants of injuries and MSDs. It was a cross-sectional survey, conducted with 3479 frontline workers in 60 factories during 2008-2009. We calculated the annual incidence rates of work-related injuries and the prevalence rates of MSD (based on the Nordic Standard Form) for the factory workers. Logistic regression analysis was applied to explore the associations between potential risk factors and occupational injury and MSD. Among all participating workers, 8.3% reported acute traumatic injuries in the previous 12 months.

The event-based incidence rate was 119.6 per 1000 person-years. About half of the frontline workers reported suffering from MSDs during the previous 12 months. The injury risk was reduced for female workers (Odds ratio, OR: 0.48; 95% confidence interval, CI: 0.36-0.66) and those with higher educational levels, but increased in workers with over 55 work hours/week (OR: 1.64; 95% CI: 1.21-2.22), high mental stress at work (OR: 3.50; 95% CI: 1.70-7.19) and previous injury history (OR: 3.94; 95% CI: 2.78-5.58). The MSD risk was increased among female workers (OR: 1.58; 95% CI: 1.34-1.87), and those with over 55 work hours/week (OR: 1.56; 95% CI: 1.28-1.90), high mental stress at work (OR: 3.16; 95%

CI: 2.04-4.89) and a past injury history (OR: 3.04; 95% CI: 2.14-4.32). High proportions of frontline workers were affected by work injuries and MSDs in these factories in China. Long work hours, high mental stress at work and previous injury history were important risk factors for work-related injury and MSD (Nafees, 2013).

**2.9 Respiratory health effects in poultry workers:**

The South African poultry industry dominates the agricultural sector with more poultry products consumed annually than all other animal-protein sources combined. Individuals involved in animal production, particularly poultry workers, have been reported to have a greater prevalence of respiratory symptoms than other farmers or rural residents. This review focuses on respiratory diseases associated with poultry work published in the literature from 1980-2014. The review confirms that poultry workers are at increased risk of developing adverse respiratory health outcomes that may be attributed to exposure to dust and other airborne contaminants in poultry-house environments. Further research needs to focus on describing, in more detail, the various respiratory phenotypes and their prevalence in poultry workers. More studies need to explore the interaction between the complex environmental exposures and host risk factors in causing respiratory disease in this group of workers.

Studies conducted among poultry workers have documented the prevalence of asthma varying between 1% and 43% for self-reported asthma and 6% to 14% for asthma diagnosed using spirometry.4,6,39,43-46

The prevalence reported in most studies has been that of general adult asthma, which is generally higher in poultry workers than other occupations including other farm workers.40,41 Additionally, studies have reported a higher prevalence of work-related symptoms that were consistent with asthma in poultry workers compared to non-poultry workers. Fourteen out of 16 poultry workers were reported to have work-related asthma like symptoms, one of whom tested positive to northern fowl mites.47 Asthma had been diagnosed in 4%, 13% and 11% in poultry workers with low, medium and high exposure to poultry dust respectively, compared to 3% in controls in a South African study.6 10.7% of Victoria broiler growers had asthma compared to a prevalence of 5.7% among adults in

South Australia.48 Symptoms of occupational asthma were reported in 5.3% of poultry feed workers49 whereas no significant difference in asthma symptoms between poultry workers and controls have been reported in other studies.45,50

The prevalence of chronic bronchitis in various studies among poultry workers varied between 4.4% to 21%.6,32,45,51,52 This prevalence had been reported to be higher when compared to unexposed controls. A study done to assess the respiratory symptoms and lung function of Norwegian farmers reported a two fold increase in odds of chronic bronchitis among poultry farmers compared to crop farmers (OR 2.2, CI 1.3-4.0).51 Similarly, a significantly increased risk of chronic bronchitis was reported in South African poultry workers with medium (OR=2.88, CI: 1.14 -7.28) and high dust exposure (OR=2.86, CI: 1.04-7.90). The prevalence of work related chronic bronchitis was higher in poultry handlers (15.5%) as compared to other workers exposed to organic dusts in a UK study.32

The prevalence of rhinitis among poultry workers from various studies has been in the range of 19% to 39%.22,26,39-42

Rimac et al reported a fourfold higher prevalence of rhinitis among poultry workers when compared to controls.39 Symptoms of rhinitis were reported in all workers with a job-duration greater than 11 years in a poultry farm, and the incidence of rhinitis was shown to have bearing on the incidence of both cough and breathlessness.42 A higher prevalence was reported among workers in floor-based operations when compared to cage-based operations in a study comparing the two housing systems.22

This review has demonstrated that poultry farm workers are at increased risk of developing adverse respiratory health outcomes that may be attributed to exposure to dust and other airborne contaminants in poultry house environments. Intervention programs aimed at reducing exposure to dust is likely to have a positive impact on the respiratory health of workers (Dr Dorothy Ngajilo, june 2014)

# Chapter 3

# Aim and Objective

### 3.1 Aim and Objective

The main objective of the present study was to investigate the condition of physical health among Garments workers, Spinning mill workers, Poultry firm workers.

Also to investigate the prevalence of different diseases and symptoms among Garments workers, Spinning mill workers, Poultry firm workers. Also to investigate their immunization status, smoking and addiction habit and overall health conditions.

# Chapter 4

# Materials and Methods

## 4. Materials and Methods:

### 4.1 Type of study:

It is a cross sectional study. In this study, 200 workers were taken. The information taken from spinning mills, garments and poultry firm worker.

### 4.2 Place of study:

The study was conducted in three places. It includes garments and spinning mills worker from Gazipur, poultry firm worker from Rayer Baza-Dhaka and Basila-Mohammadpur beribadh.

### 4.3 Study period:

To complete the study in time a work schedule is prepared depending on different task of the study, from April 28 to December 30, 2015.Eight months were used to collect data. Subsequent months spent on report writing and submission of report.

### 4.4 Sample size:

The data collected from 200 of spinning mills, garments and poultry firm workers.

### 4.7 Research approach:

After getting the approval of the research proposal from the honorable faculty members for data collection. Research work was approached by collecting information from different workers and who were agreed to give the information.

### 4.8 Data collection method:

After explaining the purpose of the study to the workers randomly they were interviewed by asking question in Bangla and used thoroughly pre-tested questionnaires. The questionnaire contained general information and socio-economic status and personal question of workers.

### 4.9 Data analysis:

After collecting all data, data were analyzed with Microsoft office excels (Pie Charts & Bar Diagrams). Then we analyze the all data by different strategies based on our target of study. The results were presented in tabulated from as well as figures & drawings.

# Chapter 5

# Result

**Graph-5.1.1: Percentage of participants by Gender:**

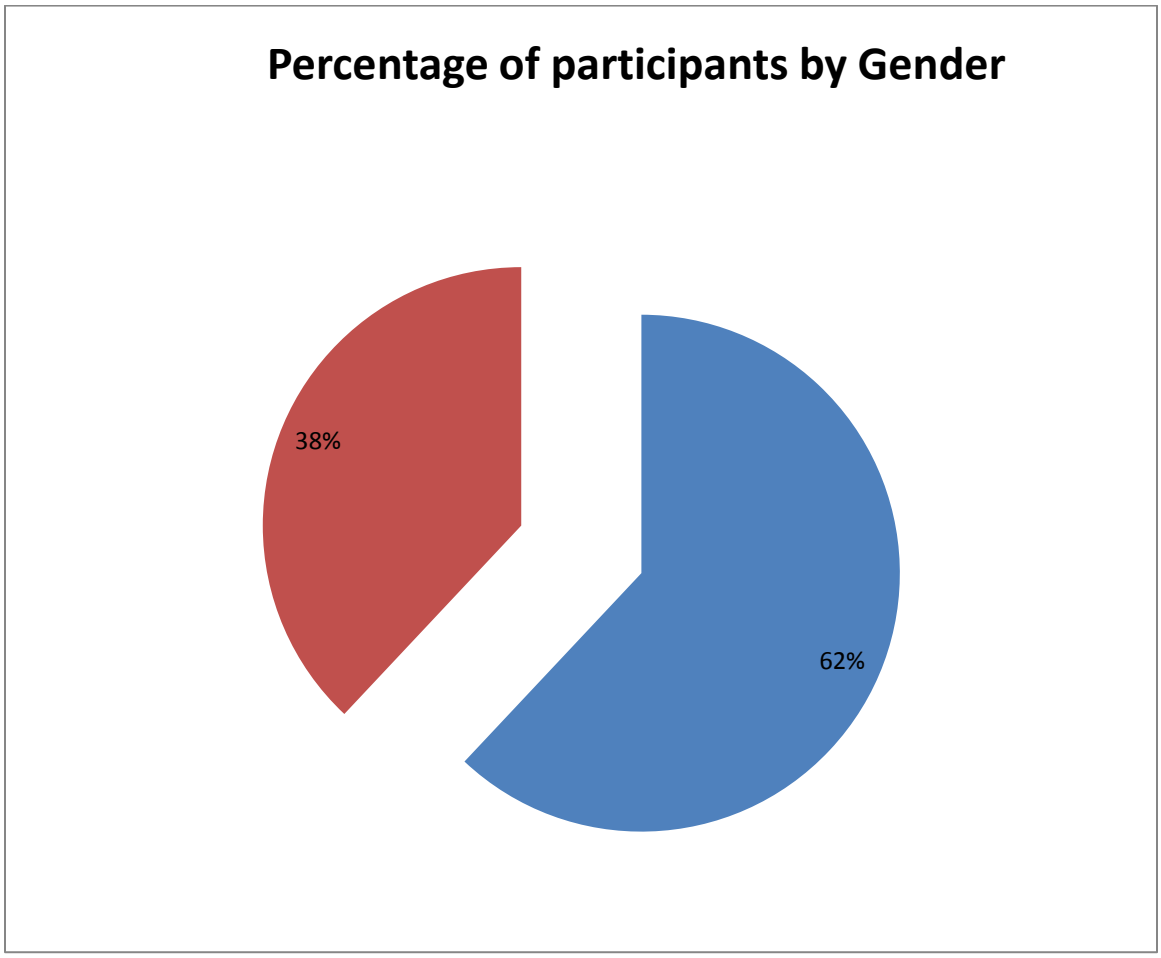


**Fig: 5.1.1: Frequency of workers by Gender**

In this study total number of participants were 200. Number of male participants was 62% (n=124) and female 38% (n=76).

**Table-5.2.1: Percentage of the average age of the workers:**

| Variables | Frequency | Percentage |
|---|---|---|
| 15-30 | 138 | 69% |
| 31-45 | 46 | 23% |
| 46-60 | 16 | 8% |

In age distribution of workers most of them (69%) are in the age group 15 to 30 years, 23% in the age group 31 to 45 years and 8% of workers in the age ranges from 46 to 60 years.

**Graph-5.1.2: Distribution of workers by marital Status:**

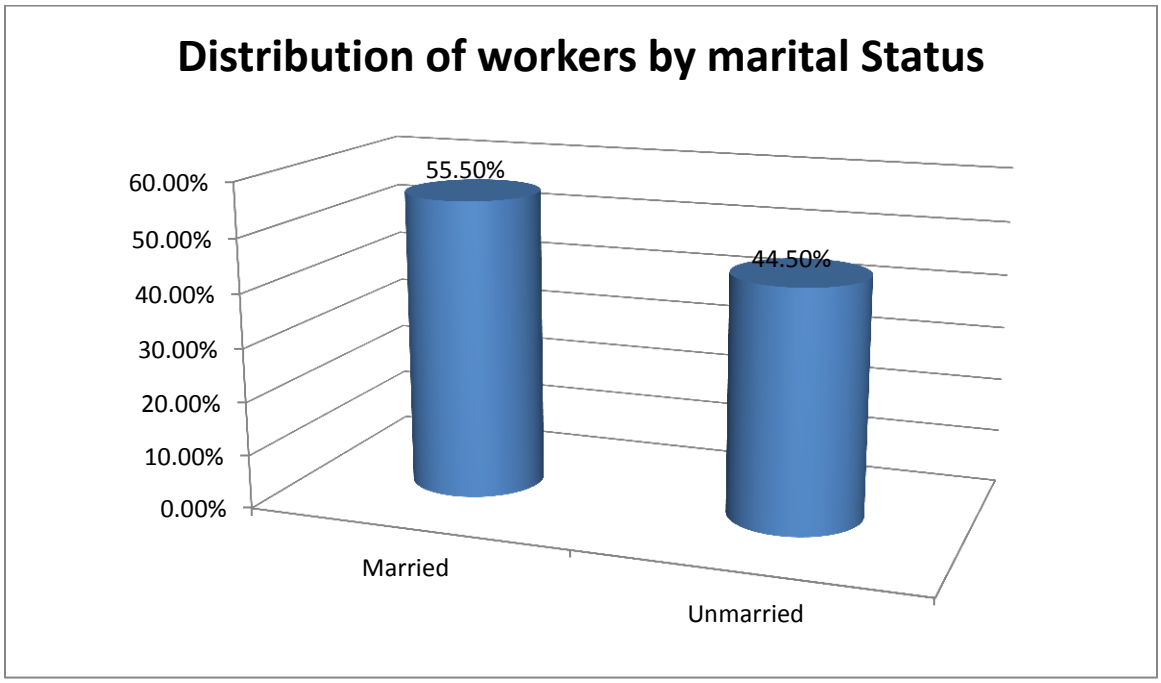


**Fig**: **5.1.2: Marital Status of Workers**

Out of 200 workers 55.5% (n=111) workers were married and 44.5% (n=44.5) were unmarried.

**Table-5.2.2: Percentage of workers by their occupation:**

| Variables | Frequency | Percentage |
|---|---|---|
| **Sppining mils worker** | 80 | 40% |
| **Garments Worker** | 45 | 22.5% |
| **Poultry firm worker** | 75 | 37.5 |

In this study out of 200 workers 40% is Spinning mils workers, 22.5% is garments workers and 37.5% is poultry firm workers.

**Table-5.2.3: Works places of workers:**

| Variables | Frequency | Percentage |
|---|---|---|
| Rayer Bazar | 38 | 19% |
| Basila | 47 | 23.5% |
| Gazipur | 115 | 57.5% |

Among 200 workers 57% of workers work in Gazipur, 23.5% of workers works in Basila-Mohammadpur beribadh & 19% of workers work in Rayer Bazar.

**Table-5.2.4: Distribution of workers by work hour:**

| Variables | Frequency | Percentage |
|---|---|---|
| 8-12 | 139 | 69.5% |
| 12-16 | 61 | 30.5% |

This group of workers works long time 69% (n=139) works 8 to 12 hours and 30.5% (n=61) works 12 to 16 hours.

**Graph-5.1.3: Caffeine intake:**

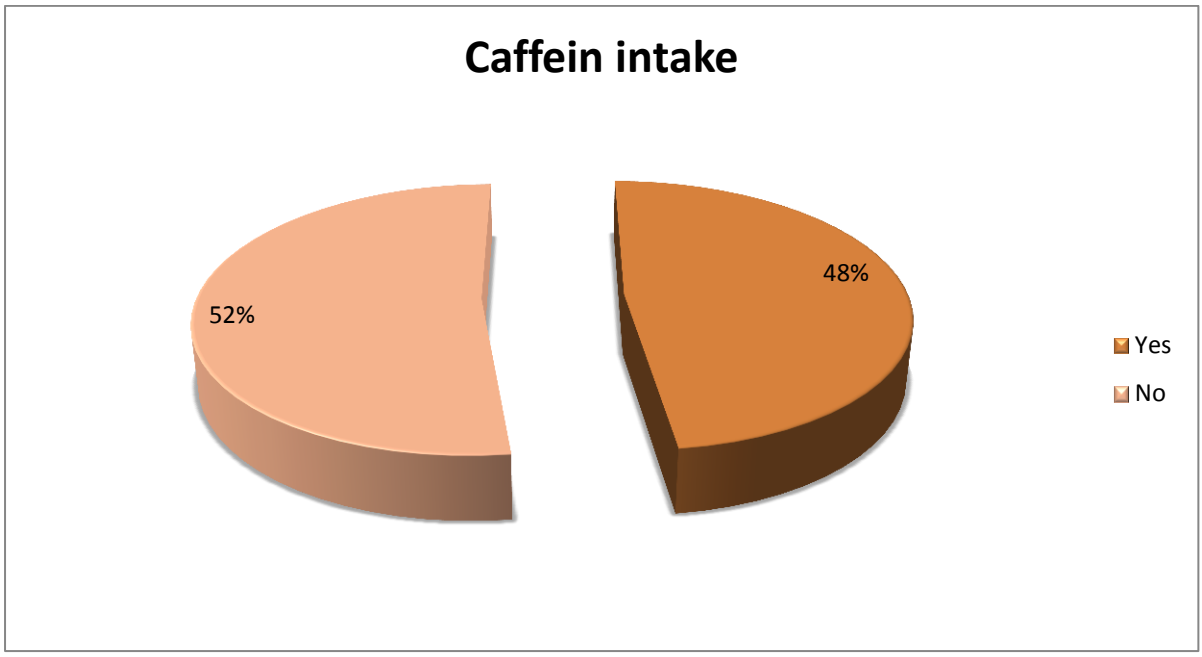


**Fig: 5.1.3: Caffeine intake of Workers**

Out of 200 workers we found that 48% (96) workers intake caffeine & 52% (114) workers didn't intake caffeine.

**Table-5.2.5: Immunization Status of workers:**

| Variables | Frequency | Percentage |
|---|---|---|
| Influenza | 0 | 00% |
| Pneumonia | 74 | 37% |
| Tetanus | 27 | 13.5% |
| MMR | 0 | 00% |
| Hepatitis B | 23 | 11.5% |
| Others | 0 | 00% |

In this study, we found that 37% (74) were vaccinated against Pneumonia , 13.5% (27) were vaccinated against Tetanus, 11.5% (23) were vaccinated against Hepatitis B Virus, No one was vaccinated by MMR and Influenza.

**Graph-5.1.4: Transfusion history of workers**

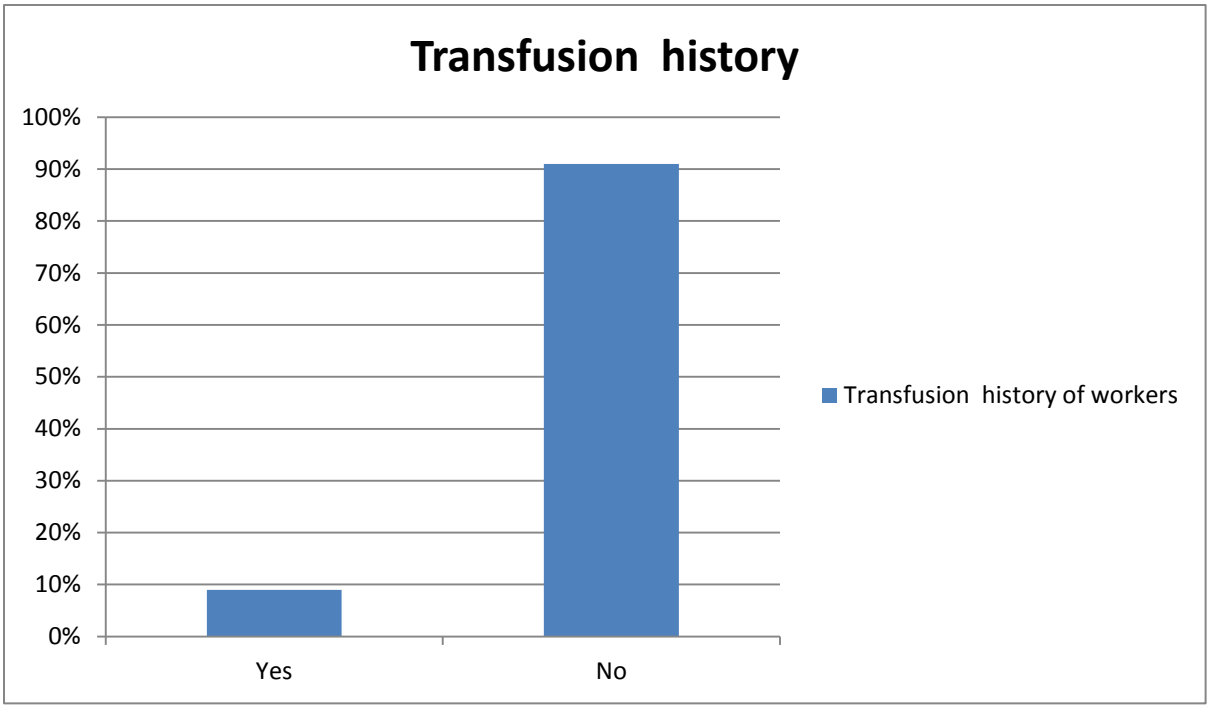


**Fig: 5.1.4: Transfusion history of workers**

Out of 200 workers 9% (18) had transfusion history and 92% (182) had no transfusion history.

**Table-5.2.6: Percentage of workers by weight:**

| Variables | Frequency | Percentage |
|---|---|---|
| 25-45 | 39 | 19.5% |
| 46-65 | 118 | 59% |
| 66-85 | 43 | 21.5% |

Among 200 workers 19.5% 0f workers weight range is 25-45 kg, Most of the workers weight range is 46-65 kg that is 59% and 21.5% workers weight range 66-85kg**.**

**Graph-5.1.5: fatigue/ weakness:**

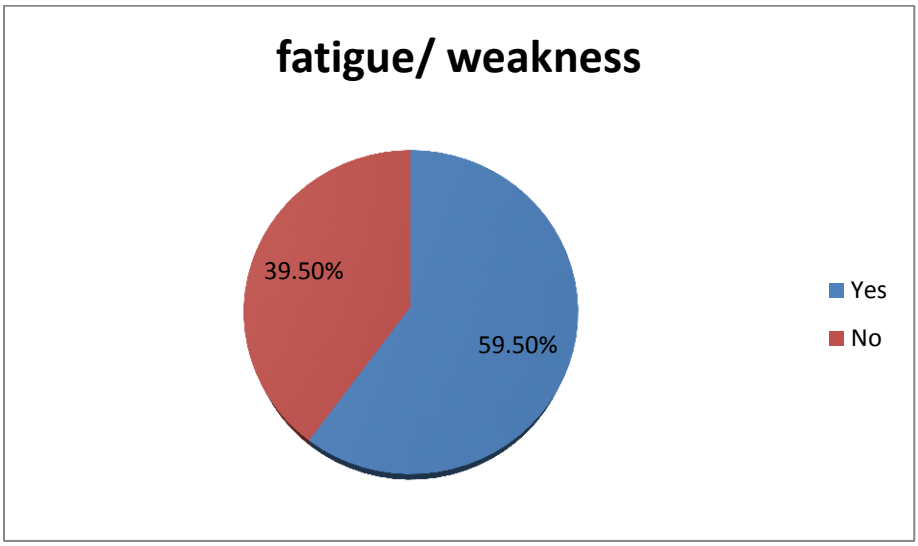


**Fig: 5.1.5: fatigue/ weakness**

Studying constitutional symptoms we have seen that out of 200 workers 59.5% (119) felt fatigue/weakness during their duty and 39.5% (81) did not feel fatigue.

**Table-5.2.7: Percentage of gastrointestinal problem:**

| Symptom Name | Gastrointestinal Problem | |
|---|---|---|
| | Frequency | Percentage (%) |
| Loss of appetite | 59 | 29.5 |
| Nausea or vomiting | 23 | 11.5 |
| Painful bowel movement or constipation | 18 | 9 |
| Frequent diarrhea | 11 | 5.5 |
| Abdominal pain | 34 | 17 |
| Heart burn | 77 | 38.5 |

In this study loss of appetite of workers was found in 29.5% (n=59) and Nausea or Vomiting was found in11.5% (n=23). Change in bowel movements or constipation was found in 9%, (n=11) workers. Nausea or vomiting was found in 11.5% (n=23) workers. Painful bowel movements or constipation was found in 9% (n=18). Frequent diarrhea was found in 5.5% (n=11) workers. Stomach/abdominal pains was found 17% heartburn was found in 38.5% (n=77) of workers.

**Graph -5.1.6: blurred vision:**

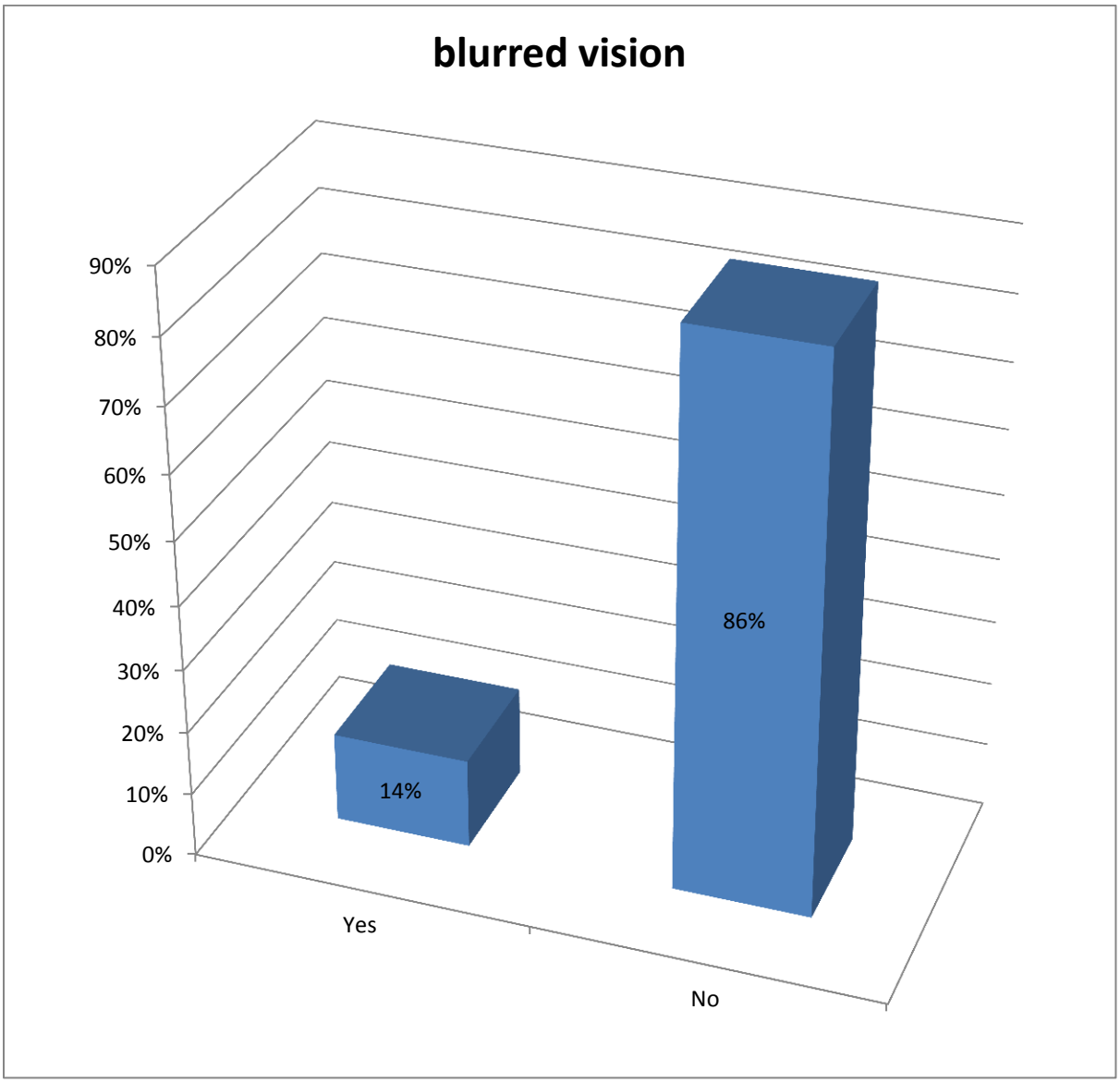


**Fig: 5.1.6: blurred vision**

Out of 200 workers 14% (28) complaints blurred vision and 86% (172) workers had no difficulty in vision.

**Graph-5.1.7: neck pain/stiffness:**

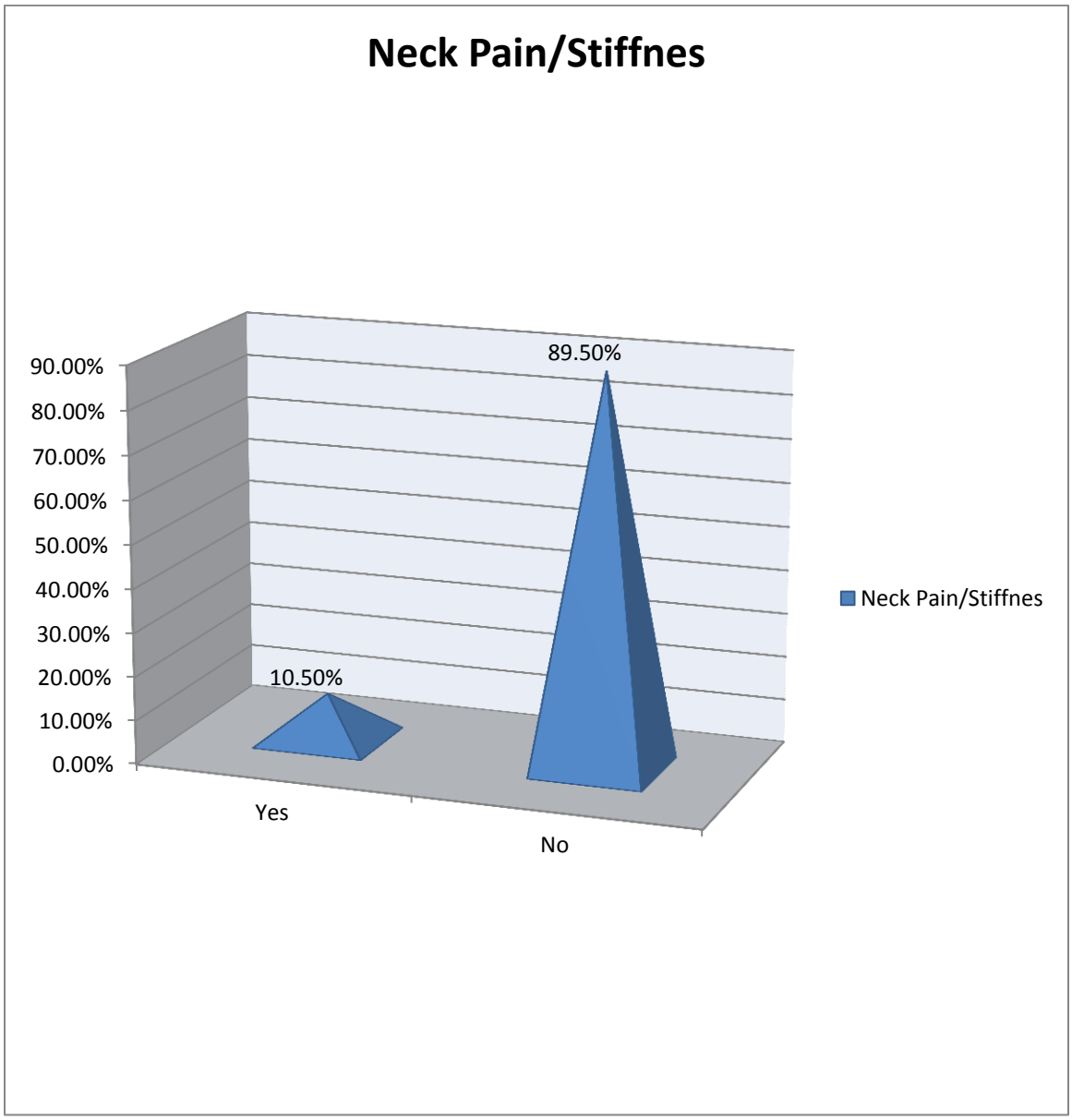


**Figure: 5.1.7: neck pain/stiffness**

In this study Out of 200 workers 10.5% (21) suffered in neck pain 89.5% (179) workers had no history of neck pain.

**Table- 5.2.8: Percentage and Frequency of Musculoskeletal symptom**

| Symptoms Name | Symptoms of Musculoskeletal problems | |
|---|---|---|
| | **Frequency** | **Percentage (%)** |
| **Joint Pain** | 53 | **26.5%** |
| **Back Pain** | 27 | **13.5%** |

Joint pain, Back pain was very common. Out of two hundred joint pain was found in 26.5% and Back pain was found in 13.5%.

**Graph-5.1.8: Respiratory problem of workers:**

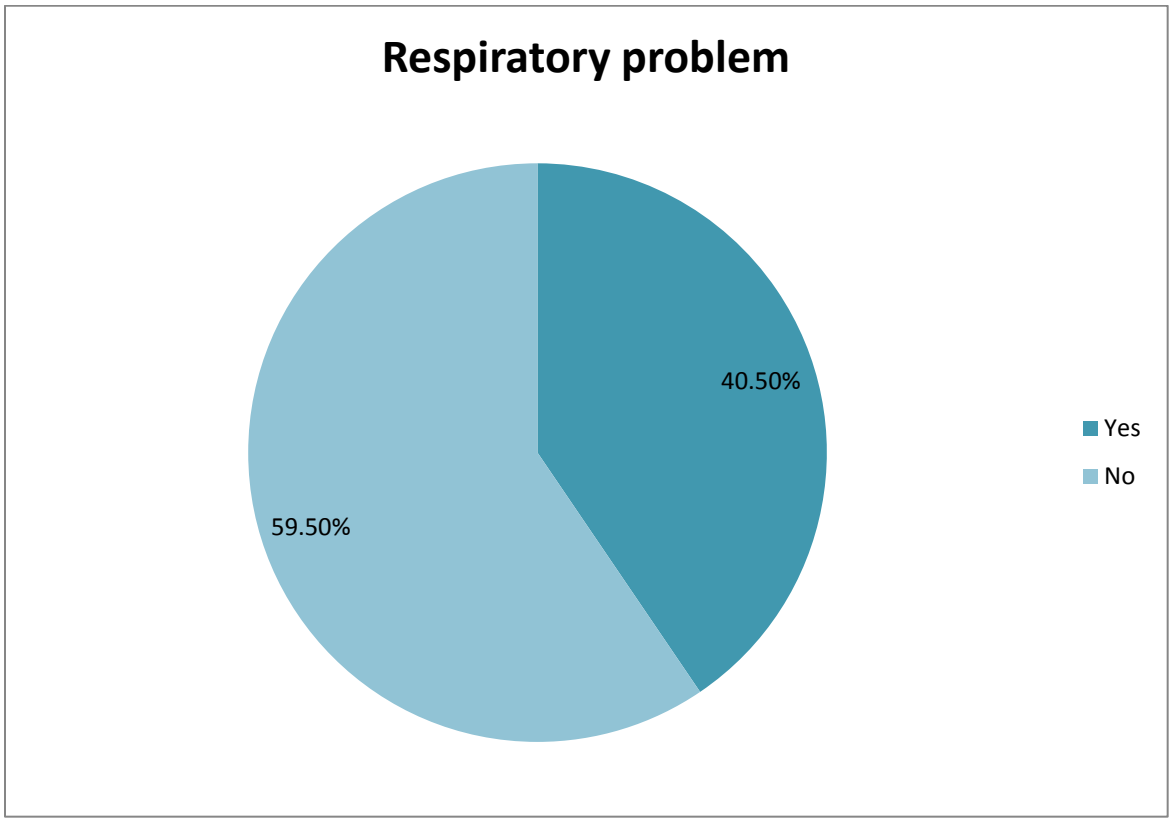


**Fig: 5.1.8: Respiratory problem**

Respiratory problem is another common problem. Out of 200 workers 40.5% workers have respiratory problem**.**

**Graph -5.1.9: Skin changes among workers:**

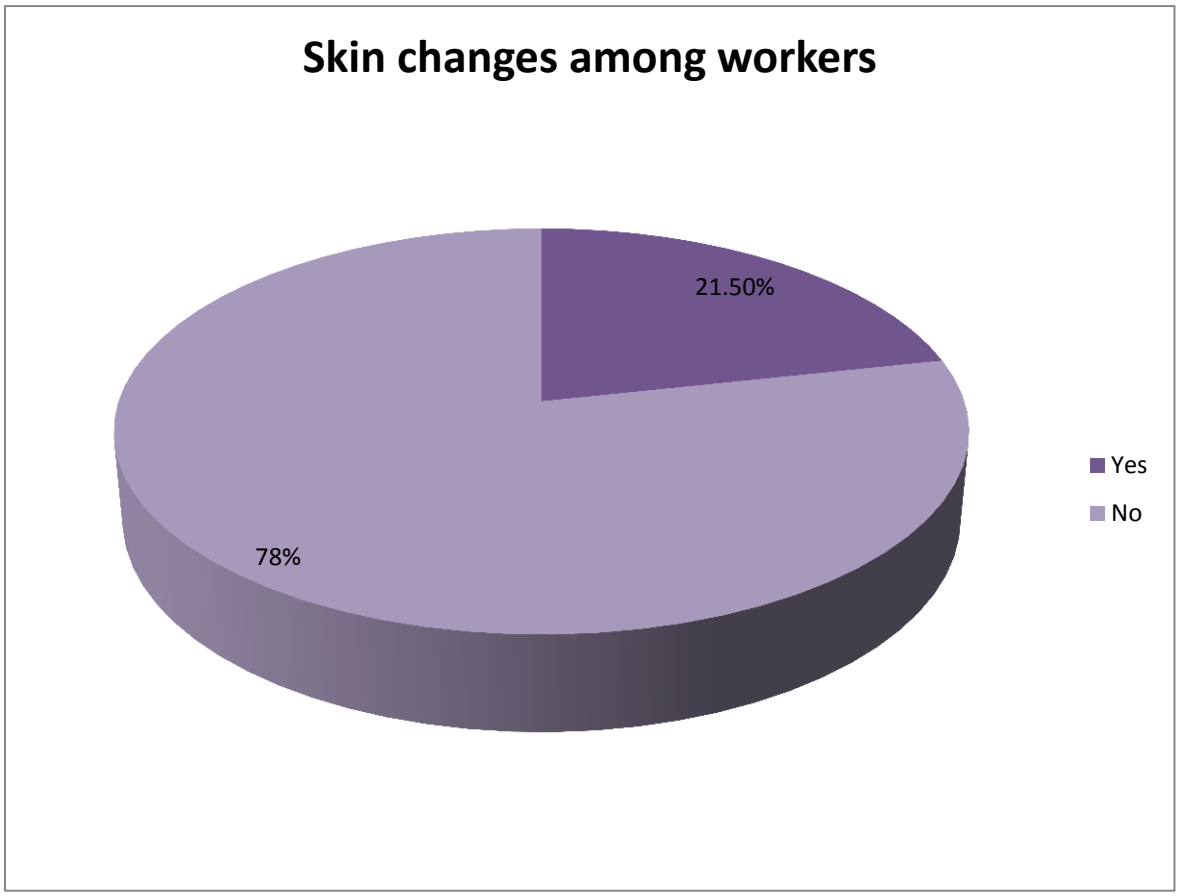


**Fig: 5.1.9: Skin changes among workers**

This study showed that among 200 workers,78% (167) workers had no history of skin changes and 21% (43) workers complaint skin problem such as skin rash, allergy etc.

**Table-5.2.9: Screening for HIV:**

| Variable | frequency | Percentage(%) |
|---|---|---|
| Yes | 19 | 9.5% |
| No | 181 | 80.5% |

This study showed that out of 200 workers 19 (9.5%) had done screening test for HIV and 252 (80.5%) were not tested for HIV

**Table-5.2.10: Percentage of Depression:**

| Variable | frequency | Percentage(%) |
|---|---|---|
| Yes | 67 | 33.5% |
| No | 133 | 66.5% |

In this study we see that many workers, about 33.5%(67) suffered depression and 66.5%(133) did not complains of depression.

**Graph-5.1.10: Distribution of workers by sore throat**

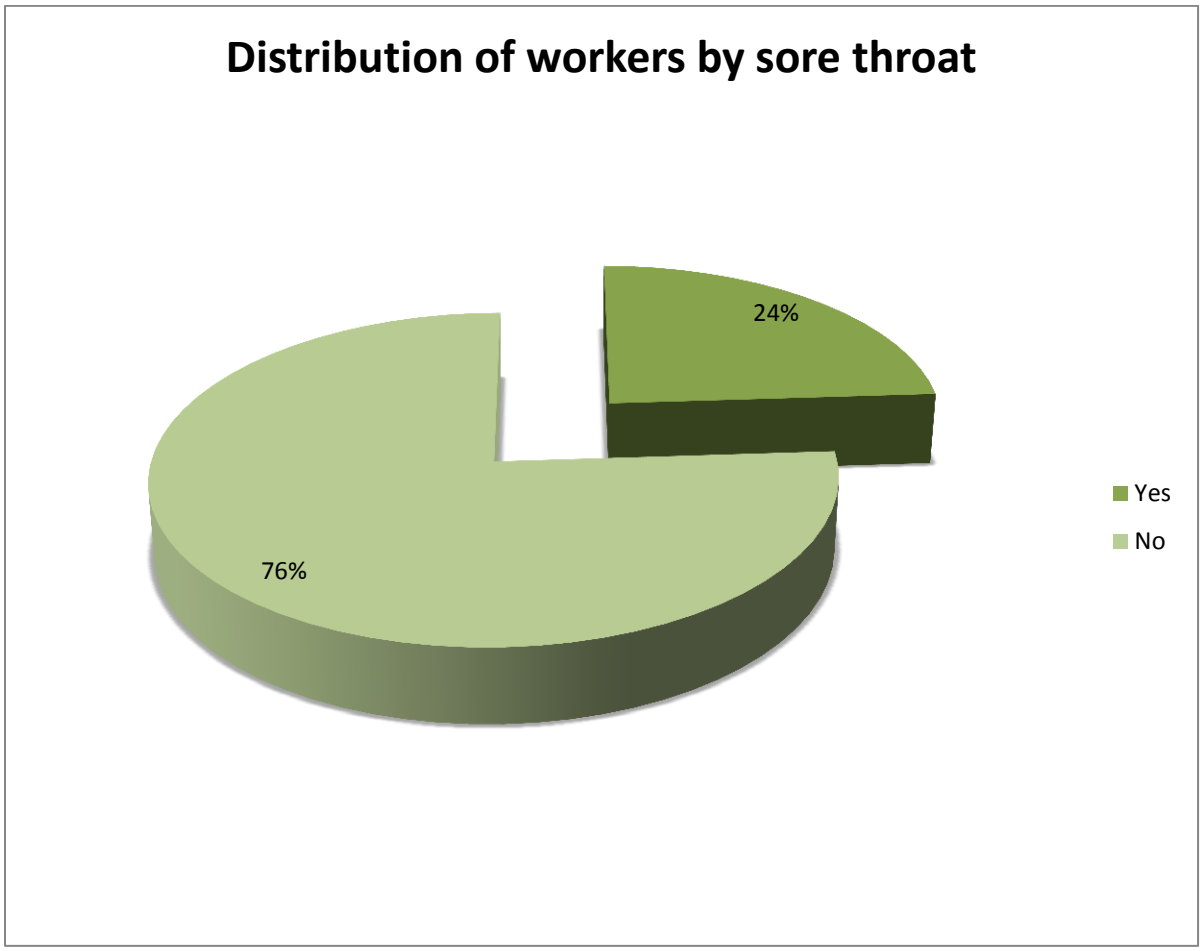


**Fig: 5.1.10: Distribution of workers by sore throat**

24% (n=48) of workers has sore throat problem 76% (n=152) has no sore throat problem.

**Graph-5.1.11: Percentage of hearing loss:**

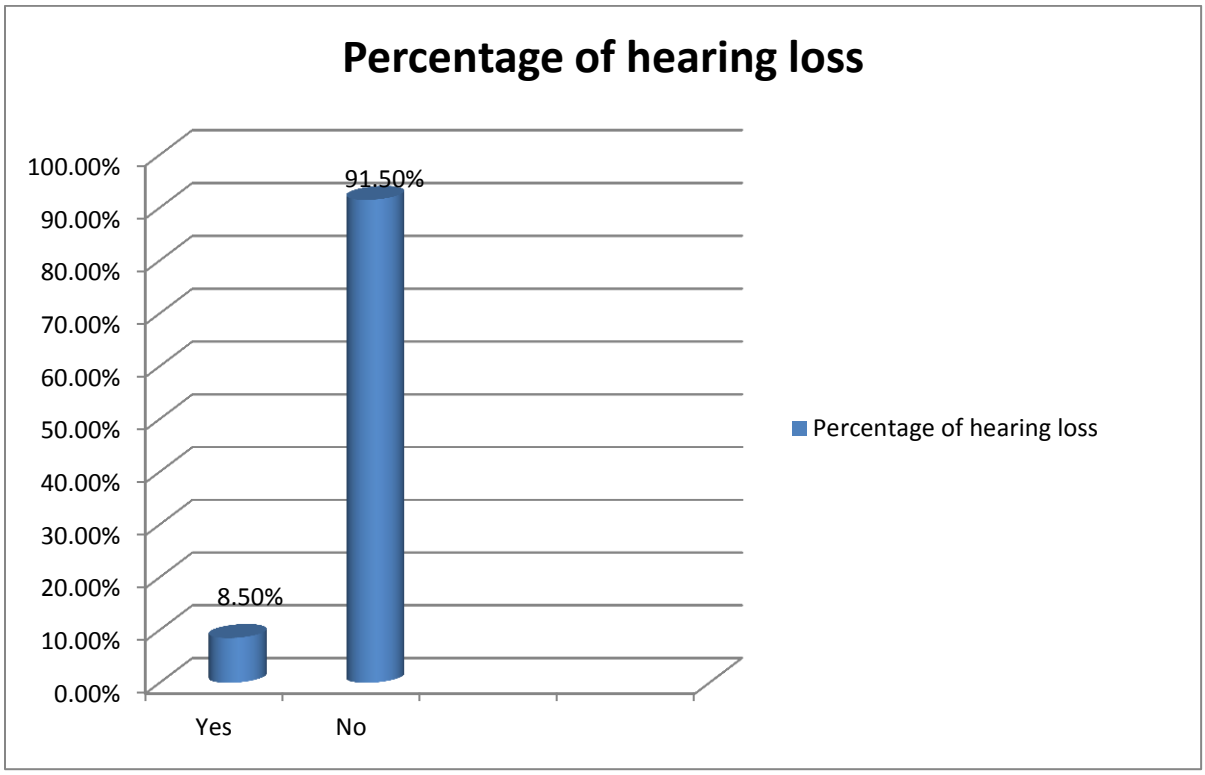


**Fig: 5.1.11: Percentage of hearing loss**

This study shown that 8.5% workers problem with hearing and 91.5% workers has no problem with hearing.

# Chapter 6

# Discussion

**Discussion 6.1**

Most of the health problems that the garment and spinning mills workers suffered arose from the occupational hazards including long working hours, absence of leave facilities, congested and over-crowded working conditions, absence of health facilities and safety measures, absence of staff amenities, lack of safe drinking water, lack of first aid box, safe working counseling or psychological counseling etc. Harrington & Gill (1989) reported that occupational health hazard is concerned with health hazard in relation to work environment of workers.

Almost all the workers in this sector suffer from various types of illness and diseases like the problems in their bones, complexity due to abortion, dermatitis, back pain, eye strain, pruritus, malnutrition, respiratory problems, hepatitis, gastric pain, fatigue, fever, abdomen pain, common cold, and helminthiasis.

A recent effort of the World Health Organization (WHO) has provided insight into the global dimensions of several selected occupational health risks. WHO included five occupational risk factors in its comparative risk assessment in a unified framework of 26 major health risk factors contributing to the overall global burden of disease and injury. We trying to find common occupational health problem in garments, spinning and poultry firm worker.

In this study the total number of study sample was 200. There were total three classes of workers e.g. Garments worker; Spinning mills workers and Poultry firm Workers. The distribution of workers were Garments worker 22.5%,Spinning mills workers 40%,Poultry firm Workers 37.5%.Several age group working in Garments, Spinning mills and Poultry firm Maximum age was 59 years and minimum age 10 years. In this workers 69% are ranging from (15-30) years, 23% are ranging from (31-45) years and 8% are ranging from (46-60) years. The gender distribution of the workers were Male 62% and Female 38 %. Most of the workers 59% had weight ranging 46 to 65 Kg. Majority of the workers 69.5% work 8 to 12 hours per day and 30.5% work 12 to16 hours per day.55.5% of workers are married and 44.5% of workers are unmarried.

Vaccination is important for all type of workers we found that 37% of workers take Pneumonia vaccine, 13.5% taken tetanus and 11.5% taken Hepatitis B vaccine. Out of 200 workers we found that 48% workers intake caffeine & 113% workers didn't intake caffeine. Studying constitutional symptoms we have seen that out of 200 workers 59.5% felt fatigue/weakness during their duty and 39.5% did not feel fatigue/weakness. In this study loss of appetite of workers was found in 29.5% and Nausea or Vomiting was found in11.5% (n=23). Change in bowel movements or constipation was found in 9%, workers. Nausea or vomiting was found in 11.5% (n=23) workers. Painful bowel movements or constipation was found in 9%. Frequent diarrhea was found in 5.5%, workers. Stomach/abdominal pains was found 17% heartburn was found in 38.5% workers. 14% of workers suffering in blurred vision and 90% workers had no difficulty in vision. 10.5% suffered in neck pain 89.5% workers had no history of neck pain. Joint pain, Back pain were very common. Out of two hundred joint pain was found in 26.5% and Back pain was found in 13.5%. This study shown that 8.5% workers problem with hearing and 91.5% workers has no problem with hearing.

Respiratory problem is another common problem. Out of 200 workers 40.5% workers had respiratory problem. 78% workers had no history of skin changes and 21% workers complaint skin problem such as skin rash, allergy etc. 9.5% had done screening test for HIV and 252 (80.5%) were not tested for HIV. In this study we see that many workers, about 67 (33.5%) suffered depression and 66.5% did not complains of depression. 24% of workers has sore throat problem 76% has no sore throat problem.

# Chapter 7

# Conclusion

## Conclusion

The high level of presence of gastrointestinal symptoms is due to the work environment. Presence of cardiovascular, musculoskeletal symptoms e.g. joint pain, back pain is due to the nature of their occupations. Working environment should be improved. Further study is required to get more information about their health conditions. The burden of occupational health problems is staggering in both human and economic costs, and workers in the developing world bear this burden disproportionately. Moreover, the most vulnerable—children and the poor—are also disproportionately at risk. Compounding this tragedy is that many effective and economically feasible interventions are available to address these largely preventable health conditions.

In this study we have tried to analyze different aspects of physical and mental health of workers. Although occupation is not associated with many of the health indicators, some health problems like weakness, decreased appetite, respiratory problems, neck stiffness, insomnia and depressive illness are more prevalent among workers. We also found that our workers are accustomed to work in an unhygienic environment. And these health problems are because of working in an unhygienic environment, always exposed to infectious agents, insufficient nutrition and stress related to their job. This group of workers plays an important role in Economical development. So we should take measures to improve health status of this group of workers to build our economy more strong.

# Chapter 8

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