

**A SURVEY ON PREVALENCE OF SKIN DISEASES  
IN DYEING DEPARTMENT OF GARMENT  
INDUSTRIES IN NARAYANGANJ DISTRICT**

*This dissertation is submitted to the Department of Pharmacy, East West University  
in the partial fulfillment of the requirements for the Degree of Bachelor of  
Pharmacy*

**Submitted To**

**Dr. Tasnuva Haque**

Assistant Professor

Department of Pharmacy

**Submitted By**

**Noor Nahar**

ID: 2014-1-70-016



**Department of Pharmacy  
East West University**

## **Declaration by the Research Candidate**

I, **Noor Nahar, ID: 2014-1-70-016** hereby declare that the dissertation entitled “A SURVEY ON PREVALENCE OF SKIN DISEASES IN DYEING DEPARTMENT OF GARMENT INDUSTRIES IN NARAYANGANJ DISTRICT” submitted by me to the Department of Pharmacy, East West University and in the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, under the supervision and guidance of **Dr. Tasnuva Haque**, Assistant Professor, Department of Pharmacy, East West University, Dhaka, Bangladesh.

-----  
**Noor Nahar**

**ID: 2014-1-70-016**

Department of Pharmacy,

East West University

Dhaka, Bangladesh.

## **Certificate by the Supervisor**

This is to certify that the dissertation entitled “A SURVEY ON PREVALENCE OF SKIN DISEASES IN DYEING DEPARTMENT OF GARMENT INDUSTRIES IN NARAYANGANJ DISTRICT” submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy is a trustworthy record of original and genuine research work carried out by **Noor Nahar, ID: 2014-1-70-016** under my supervision and guidance.

---

**Dr. Tasnuva Haque**

Assistant Professor

Department of Pharmacy

East West University

Dhaka, Bangladesh

## **Certificate by the Chairperson**

This is to certify that the dissertation entitled “A SURVEY ON PREVALENCE OF SKIN DISEASES IN DYEING DEPARTMENT OF GARMENT INDUSTRIES IN NARAYANGANJ DISTRICT” submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy is a trustworthy record of original and genuine research work carried out by **Noor Nahar, ID: 2014-1-70-016** under the supervision and guidance of **Dr. Tasnuva Haque**, Assistant Professor, Department of Pharmacy, East West University and no part of this project has been submitted to other degree.

-----

**Dr. Chowdhury Faiz Hossain**

**Associate Professor and Chairperson**

Department of Pharmacy

East West University



## **Acknowledgement**

First, all praise and glory are to ALLAH for all the bounties granted to me and only with His guidance and help this achievement has become possible.

I would like to express my deepest gratitude to my supervisor and respected teacher **Dr. Tasnuva Haque**, Assistant Professor, Department of Pharmacy, East West University, for her constant supervision, intense support, enthusiastic encouragements and constructive criticism during the thesis work. Her timely advice and encouragement have made it possible for me to accomplish the task as per schedule.

I put forward my most sincere regards and profound gratitude to **Dr. Chowdhury Faiz Hossain, Associate Professor and Chairperson**, Department of Pharmacy, East West University, for his inspiration in my study. He also paid attention for the purpose of my research work and extending the facilities to work.

I express my sincere thankfulness to my family for guiding me all through my life, including that for my research project. I also would like to thank **Toahera Jannat, Hafiza Sultana Eity, Eity Bormon, Adity Ghosh, Farhana Sharmin Shurovy** and my all friends, who gave me support for my research work.

During the course of this research work, a lot of experiences I have received which is of inestimable value for my life.

## **Dedication**

**My beloved parents; MD. Altafur Rahman and Afroza Rahman and also my brothers.**

## Table of contents

Serial No.	Contents	Page No.
	List of Tables	I
	List of Figures	II- III
	List of Abbreviations	I V
	Abstract	V
<b>Chapter 1</b>	<b>Introduction</b>	<b>1-18</b>
1.1	Overview of Bangladesh Garment Industry	1-3
1.2	Human skin	3-5
1.3	Common skin diseases in Bangladesh	5-7
1.4	Epidemiology of skin disease in Bangladesh	7-8
1.5	Prevalence of textile dermatitis	8-9
1.6	Occupational skin disorder	9-10
1.7	Commonly used dyeing chemicals in the textile industries	10-13
1.8	Health risk associated with dyeing chemicals	13-15
1.9	Literature review	15-18
1.10	Aim of this project	18
<b>Chapter 2</b>	<b>Method &amp; Materials</b>	<b>19-22</b>
2.1	Materials	19
2.2	Method	19
2.2.1	Literature review	20
2.2.2	Survey	20-21
2.2.3	Data analysis	21
<b>Chapter 3</b>	<b>Results &amp; Discussions</b>	<b>22-48</b>
3.1	Age range of the participants	22-23
3.2	Gender distribution of the respondents	23-24
3.3	Duration of working at the same position	24-25
3.4	Duration of work in the dyeing industry	26
3.5	Family history of skin disease	27-28

<b>Serial No.</b>	<b>Contents</b>	<b>Page No.</b>
3.6	Skin disease from childhood	28-29
3.7	Type of accommodation	30-31
3.8	Number of people living in a room	31-32
3.9	Roommate having any skin disease	32-33
3.10	Spreading of skin disease from roommate	34
3.11	Data representing the respondents who had or developed skin disease	34
3.12	When they first got the skin disease	35
3.13	Frequency of suffering from skin rashes	35-36
3.14	Hay fever, nasal allergic symptoms, eye allergic symptoms, asthma	36
3.15	Working hours per day	36
3.16	Symptoms of redness, dry, itchy skin etc. in the past 12 months	36
3.17	Part of the body where skin disease occurred	37
3.18	Frequency of recurring skin disease (weeks)	37
3.19	Possible reasons of starting the skin disease	38
3.20	The occupation when skin disease started	38
3.21	Visited a doctor for skin disease	39
3.22	Things at work made the skin disease worse	39
3.23	Thing outside the dyeing work made the skin disease worse	39
3.24	Did skin disease improve when they went away from work?	40
3.25	Skin disease affected the work	40
3.26	Sick listed or off to work because of skin disease	41
3.27	Negative influence on financial situation	41-42
3.28	Skin disease affected their lives in the last 12 months	42
3.29	Skin rash due to metals	42
3.30	Having dry skin	43
3.31	Skin itching when sweat	43-44
3.32	Use of protective gloves at work	44

<b>Serial No.</b>	<b>Contents</b>	<b>Page No.</b>
3.33	Type of gloves used at work	45
3.34	Skin symptoms as a result of wearing protective gloves	45-46
3.35	Have changed or stop using gloves due to skin problem	46
3.36	Washing hand per day at work	46
3.37	Overall health compared to others	47
3.38	Hours per day of activities outside of their work	47
3.39	Inform inline manager about skin disease	48
3.40	40 Had any safety training	48
<b>Chapter 4</b>	<b>Conclusion</b>	<b>49-51</b>
<b>Chapter 5</b>	<b>Reference</b>	<b>52-54</b>
	<b>Sample Survey Questionnaire</b>	<b>55</b>

<b>List of Tables</b>		
<b>Serial No.</b>	<b>Contents</b>	<b>Page No.</b>
1.1	List of chemicals commonly used in dyeing industries	12
1.2	Commonly used dyeing chemicals in Bangladesh	13
1.3	List of hazardous chemicals that commonly used in dyeing industries	16
<b>List of Figures</b>		
<b>Serial No.</b>	<b>Contents</b>	<b>Page No.</b>
1.1	Production unit of the garments industry	3
1.2	Dyeing unit of the garments industry	3
1.3	Anatomy of human skin	6
1.4	Different type of skin disease	8
2.1	Flow diagram of the methods used in order to conduct the survey on skin disorder of the people working in dyeing industries in Narayanganj	19
3.1	Graphical representation of age range of the participants who did not have any skin disease	22
3.2	Graphical representation of age range of the participants who had skin disease	22
3.3	Graphical representation of gender of the participants who did not have any skin disease	23
3.4	Graphical representation of gender of the participants who had skin disease	24
3.5	Graphical representation of duration the participants working at the same position who did not have any skin disease	24
3.6	Graphical representation of duration of working at the same position of the participants who had skin disease	25
3.7	Pie chart showing the duration of working in the dyeing industry of the participants who did not have any skin disease	26
3.8	Pie chart of duration of working in the dyeing industry of the	26

	participants who had skin disease	
3.9	Graphical representation of family history of skin disease of the participants who did not have any skin disease	27
3.10	Pie chart of family history of skin disease of the participants who had skin disease	28
3.11	Graphical representation of skin disease from childhood of the participants who did not have any skin disease	28
3.12	Graphical representation of skin disease from childhood of the participants who had skin disease	29
3.13	Graphical representation of type of accommodation of the participants who did not have any skin disease	30
3.14	Graphical representation of type of accommodation of the participants who had skin disease	30
3.15	Graphical representation of no. of people living in a room of the participants who did not have any skin disease	31
3.16	Graphical representation of no. of people living in a room of the participants who had skin disease	32
3.17	Graphical representation of roommate having any skin disease of the participants who did not have any skin disease	32
3.18	Graphical representation of roommate having any skin disease of the participants who had skin disease	33
3.19	Graphical representation of spreading of skin disease from roommate of the participants who had skin disease	34
3.20	Graphical representation of getting the skin disease for the first time	35
3.21	Graphical representation of frequency of suffering from skin rashes	35
3.22	Graphical representation of working hours per day	36
3.23	Graphical representation of frequency of recurring skin disease (weeks)	37

3.24	Graphical representation of possible reasons of initiating skin disease	38
3.25	Pie chart representing visiting a doctor for skin disease	39
3.26	Graphical representation of improvements of skin disease when go away from work	40
3.27	Graphical representation of sick listed or off to work because of skin disease	41
3.28	Graphical representation of negative influence on financial situation	41
3.29	Graphical representation of skin rash due to metals	42
3.30	Graphical representation of having dry skin	43
3.31	Pie chart showing the frequency of skin itching due to sweat	43
3.32	Pie chart representing the use of protective gloves at work	44
3.33	Graphical representation of type of gloves used at work	45
3.34	Graphical representation of skin symptoms as a result of wearing protective gloves	45
3.35	Pie chart representing the frequency of washing hand in a day	46
3.36	Graphical representation of overall health of the participants	47
3.37	Pie chart representing informing in the line manager about the skin disease	48



## **List of Abbreviations**

GDP = Gross Domestic Product

RMG = Ready-made garments

OSD = Occupational skin disease

RASTs = Radioallergosorbent tests

ACD = Allergic contact dermatitis

OACD = Occupational allergic contact dermatitis

## Abstract

The garment industry of Bangladesh has been the key export division and a main source of foreign exchange for the last 25 years. Dyeing is an important unit in the textile industry. But the occupation of dyeing worker carries a high risk for the development of occupational skin disease. There are several factors which increase the risk of textile workers for developing occupational skin disorders. Exposure to irritants and allergens including textile dyes can cause skin disorder. A preponderance of younger, unskilled, low-paid workers with low literacy levels, which make employee education/training challenging. Poor regulation and work safety conditions in some textile factories can also cause skin disorder. The aim of this project is to observe the prevalence of skin diseases in dyeing department of garment industries of Bangladesh. In addition, it was aimed to determine the health risk factors in the dyeing industries. Most of the dyeing workers are poor and uneducated or with minimum literacy. So they don't know which factors are responsible for their skin disease. The average dyeing company has not been actually found to care about the workers' health. Therefore, in this study it was also aimed to find out the responsible factors for causing skin diseases in the dyeing departments. The information will be helpful in finding out the factors related to the skin disorder and relevant safety procedures in garments department of textiles industries. A questionnaire based survey was conducted in the dyeing department of garment industries in Narayanganj district. A total of 130 people were surveyed in which 90 had skin disease. The questionnaire was prepared according to Nordic Occupational Skin Questionnaire. Five Dyeing industries were surveyed. From the survey it was found that the majority of respondents had dry skin, dermatitis and hand eczema as well. Some respondents had dandruff, allergic reaction, cellulites etc. From this study it was seen that working with the chemicals or using gloves for a long duration of period were the main reasons behind their skin disease. Here, it is very unfortunate to say that 100 percent respondents did not have any safety training. There was no such official training facilities for them from the company. So there is high risk of developing different types of skin disease like dermatitis, eczema, allergic reaction etc.

# **Chapter 1**

## **Introduction**

## 1.1 Overview of Bangladesh Garment Industry

Agriculture has been the backbone of economy and chief source of income for the people of Bangladesh. Government wants to decrease poverty by getting highest productivity from agriculture and achieve self-reliance in food production. Apart from agriculture, the country is much concerned about the growth of export division. Bangladesh have accelerated and changed her exports substantially from time to time. After Bangladesh came into being, jute and tea were the most export-oriented industries. However, with the continual perils of flood, falling jute fiber prices and a considerable decline in world demand, the role of the jute sector to the country's economy has deteriorated. After that, focus has been shifted to the function of production sector, especially in garment industry.

The garment industry of Bangladesh has been the key export division and a main source of foreign exchange for the last 25 years. At present, the country generates about \$5 billion worth of products each year by exporting garment. The industry provides employment to about 3 million workers of whom 90% are women. Two non-market elements have performed a vital function in confirming the garment industry's continual success; these elements are (a) quotas under Multi-Fiber Arrangement<sup>1</sup> (MFA) in the North American market and (b) special market entry to European markets. The whole procedure is strongly related with the trend of relocation of production.

According to the IMF (International Monetary Fund), Bangladesh's economy is the second fastest growing major economy of 2016, with 7.11 percent Gross Domestic Product (GDP) growth rate where the growth rate was 6.12% in 2015. Contribution of industry to the GDP was 28.1%, where RMG (ready-made garments) sector donate the biggest part. Since 2004, Bangladesh averaged a GDP growth of 6.5%, which has been importantly driven by its exports of readymade garments (Hasan et al., 2016).



**Figure 1.1 : Production unit of the garments industry**

(Kabir, 2016)



**Figure 1.2 : Dyeing unit of the garments industry**

(Source : Collected from dyeing industries of Narayanganj)

Dyeing is an important unit in the textile industry. So, dyeing workers are also important for the textile industry. But the occupation carries a high risk for the development of occupational skin disease. There are several factors which increase the risk of textile workers for developing occupational skin disorders. Exposure to irritants and allergens including textile dyes (particularly Disperse Blue 124, Disperse Blue 10 and Disperse Yellow 104), formaldehyde resins, rubber allergens and textile finishers can cause skin disorder. . A preponderance of younger, unskilled, low-paid workers with low literacy levels, which make employee education/training challenging. Poor regulation and work safety conditions in some textile factories can also cause skin disorder (Islam, 2011).

## **1.2 Human skin**

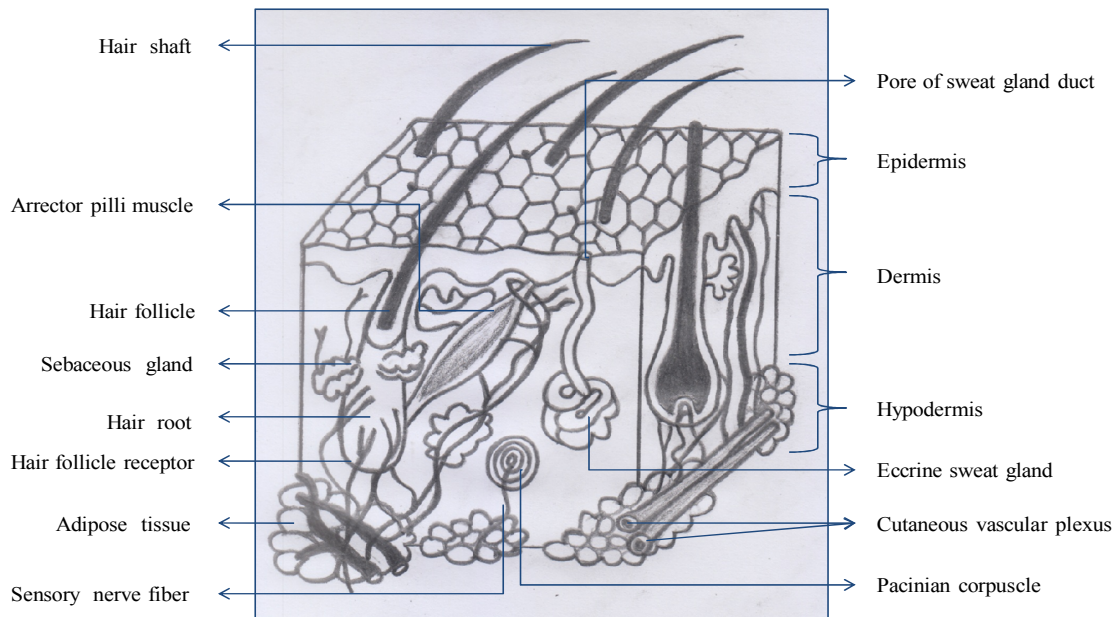
Skin is the largest organ in the body. It has two main layers: the epidermis and the dermis. These layers are supported by several other underlying structures. Skin's most important job is to create a barrier between the environment and your internal organs. Skin also regulates and controls various other functions. Any breach of the skin is considered a wound.

Skin is a defense barrier. Skin protects against trauma from water, chemicals, microorganisms, mechanical stress and irradiation. Skin regulates temperature. Skin regulates temperature by interacting with a brain structure called the hypothalamus. Skin manufactures hormones and neurotransmitters. Skin makes and uses hormones like vitamin D, steroids and thyroid hormones. Skin also makes neurotransmitters and hormones used in the brain. Skin assists the immune system. When a foreign material is present, special skin cells (called mast cells) trigger an immune reaction, which signals other components of the immune system to become active. Skin is a sensory organ. Skin helps us detect temperature, touch and vibration. Skin helps us communicate. Skin acts a signal for social and sexual communication.

Skin is self-sustaining. Millions of skin cells are shed every day, and new skin cells are regenerated to take their place. Humans are left with a brand new epidermis ever 35-45

days. The thinning of the outer epidermal layer can decrease a protein called collagen, which gives skin its ability to stretch and then return to shape. This means that older skin is more likely to wrinkle. Skin's pH becomes more neutral, making it more susceptible to infection. As we age, our skin becomes less acidic. Reduced acidity results in skin killing fewer bacteria than before. Skin becomes less firm and less elastic. Skin cells are replaced more slowly as we age. The aging process causes biochemical changes in the protein collagen, which gives skin its structure and its firmness, and the connective tissue elastin, which gives skin its elasticity. The rate of this change differs from individual to individual, depending on genetics, overall health, sun exposure, and skin care.

Skin has three layers. Epidermis is the outermost layer of the skin. The epidermis creates a waterproof barrier to hold moisture in and keep moisture out. The thickness of the epidermis varies depending on where it is located on the body. For example, it is thinner on the tympanic membrane of your eardrum and thicker on the sole of your foot. Dermis is the inner layer of the skin, which lies just beneath the epidermis. The dermis provides structure to the skin and is necessary for wound closure. The dermis contains sweat glands, which help regulate body temperature, and sebum, which keeps the skin from drying out. The deeper subcutaneous tissue (hypodermis) is made of fat and connective tissue. The skin's color is created by special cells called melanocytes, which produce the pigment melanin. Melanocytes are located in the epidermis (Orsted, 2016).



**Figure 1.3: Anatomy of human skin**

### **1.3 Common skin diseases in Bangladesh**

Skin disease is very common in Bangladesh. However, some common types of skin problem people facing in Bangladesh are listed below-

**Rash:** Nearly any change in the skin's appearance can be called a rash. Most rashes are from simple skin irritation; others result from medical conditions.

**Dermatitis:** A general term for inflammation of the skin. Atopic dermatitis (a type of eczema) is the most common form.

**Eczema:** Skin inflammation (dermatitis) causing an itchy rash. Most often, it's due to an overactive immune system.

**Psoriasis:** An autoimmune condition that can cause a variety of skin rashes. Silver, scaly plaques on the skin are the most common form.



Dandruff: A scaly condition of the scalp may be caused by seborrheic dermatitis, psoriasis, or eczema.

Acne: The most common skin condition, acne affects over 85% of people at some time in life.

Cellulitis: Inflammation of the dermis and subcutaneous tissues, usually due to an infection. A red, warm, often painful skin rash generally results.

Skin abscess (boil or furuncle): A localized skin infection creates a collection of pus under the skin. Some abscesses must be opened and drained by a doctor in order to be cured.

Warts: A virus infects the skin and causes the skin to grow excessively, creating a wart. Warts may be treated at home with chemicals, duct tape, or freezing, or removed by a physician.

Herpes: The herpes viruses HSV-1 and HSV-2 can cause periodic blisters or skin irritation around the lips or the genitals.

Hives: Raised, red, itchy patches on the skin that arise suddenly. Hives usually result from an allergic reaction.

Scabies: Tiny mites that burrow into the skin cause scabies. An intensely itchy rash in the webs of fingers, wrists, elbows, and buttocks is typical of scabies(Hoffman, 2014).



**Figure 1.4 : Different type of skin disease (Stoppler, 2017)**

### **1.4 Epidemiology of skin disease in Bangladesh**

Prevalence is defined as the proportion of a population found to have a disease over a specified period (period prevalence) or at a specific point in time (point prevalence). The prevalence of skin and skin-related diseases may change over time and vary depending on geographic areas, age distributions, and ethnic groups.

According to "World Bank Development Indicators Database, April 2006"- Bangladesh is the seventh most populous country in the world. The population is approximately 140 million in a land area of 55,598 square miles and the population density is 2,639 per square mile. Despite its huge population, extreme population density and high levels of poverty, Bangladesh has made significant progress in health in recent times. Most of the health indicators show steady gains and the health status of the population has improved. However the skin health status in Bangladesh cannot claim its partnership in the progress. It remains

static because skin care services are still based on the century-old concept which has failed to reach the whole population.

At present, skin care in Bangladesh means costly and time-consuming service provided by specialist or trainee dermatologists at the teaching and district hospitals or private clinics. Most of the work of dermatologists is concerned with curative care without paying much attention to preventive or public health measures of dermatology. Moreover, their skill and knowledge are under-utilized due to financial and technical limitations. Dermatologists often have to provide primary care due to unnecessary but unavoidable over-referral by the primary care physicians or by the patients themselves. Dermatologists in the private sector are trying to provide more sophisticated care, but it is only accessible to some rich people. Even in government hospitals, patients have to spend money almost for everything except the doctor's fee! This city-centric expensive skin care covers only around 20% of the total population. The remaining 80% of the poor, urban, semi-urban, rural and remote population have just no access to proper skin care (Barua , 2012).

### **1.5 Prevalence of textile dermatitis**

An article has been found which is based on ten publications from epidemiological studies of textile dermatitis among patients that seek care at dermatological clinics, published from 2004 until today. The number of patients enrolled in the studies ranged from 277 up to 3 325 and the prevalence data varied between 1.5% and 32.6%. The most recent study, a large European multicentre study, found that 3.6% of the tested patients had a contact allergy to disperse dyes which was assessed as clinically relevant in one third of the cases. This study, along with others, show that allergic reactions to textile dyes are more common among women than men and also more common in southern Europe compared with the northern parts. The available prevalence data are not based on a random population sample and the prevalence among the general population is not known.

According to the literature, textile dermatitis mostly occurs among consumers as lesions on the upper body, caused by tight clothing in synthetic material. However, occupational exposure may also be a problem, especially hand lesions from wearing work gloves. In

addition to prevalence data from clinical studies a survey among 858 patients with contact allergy in Sweden and Belgium showed that 18% of the patients suspected textiles as a cause of their skin problems, and that synthetic materials were the most common textile to give skin problems (Swedish Chemicals Agency, 2014)

## **1.6 Occupational skin disorder**

An occupational skin disease (OSD) is a skin disease that is caused or made worse by a work-related exposure. OSD is common in many jurisdictions it is the most common type of occupational disease. The incidence rate across all sectors is on average 4.63 cases per 10,000 full-time employees. OSD affects many different industries and occupations. OSD is more than just a rash sometimes the skin disease is so bad that an employee cannot work or carry out their usual activities at home. OSD is preventable. Early recognition and diagnosis of OSD leads to better outcomes.

The most common types of OSD include contact dermatitis; urticaria and skin cancer. The primary occupational skin disease is contact dermatitis. Contact dermatitis is a skin condition caused by contact with something that irritates the skin or causes an allergic reaction. Therefore there are two types of contact dermatitis: irritant contact dermatitis and allergic contact dermatitis. Each year, 1,000 claims are reported in Ontario for contact dermatitis. Irritant contact dermatitis is more common and accounts for 75–80% of cases while allergic contact dermatitis accounts for the rest. These forms of dermatitis are difficult to distinguish from one another, although allergic contact dermatitis can occur in other places on the body that did not come in contact with the allergy-causing material. Someone who has occupational contact dermatitis may experience redness, scaling/lacking, blistering, weeping, cracking, crusting or swelling of the skin as well as itching, pain and decreased mobility.

Urticaria is a skin condition that consists of hives, swelling and redness and results from contact with something that causes an allergic or non-allergic reaction. Contact urticaria is different from dermatitis. In particular, it usually occurs quickly following skin contact and disappears again within hours. Common causes of urticaria include latex proteins, cold or

heat, and some foods (e.g. nuts, eggs). Industries that require employees to wear single-use latex gloves are at high risk for this type of occupational skin disease, including health, emergency and public service employees. In recent years nitrile gloves have been used to replace latex gloves in order to prevent latex allergy. Nitrile gloves are believed to provide a comparable level of protection against chemical and biological agents and are more puncture resistant than latex gloves. However, manual dexterity may be compromised with nitrile glove use which may increase the risk of sharps injuries. Hence, in addition to sensitivities to a particular glove material, factors such as working practices, glove size, it, thickness and grip must also be taken into account when selecting the most appropriate glove type for an employee. Skin cancer is one of the most common types of cancer. Skin cancer accounts for about one-third of all cancers diagnosed in Ontario. While most skin cancers are not workplace related, there are well-recognized causes for those that are linked with occupation (Public Services Health & Safety Association, 2012).

Finally common skin disorder inducer in a dyeing industry were reported to be

1. Gloves
2. Dyeing chemicals and
3. Detergents

## **1.7 Commonly used dyeing chemicals in the textile industries**

Every chemical and auxiliaries have their own properties. In textile wet processing or textile dyeing industry, so many important chemicals and auxiliaries are vastly used which have been listed here (Table 1.1, Table 1.2).

**Table 1.1:** List of chemicals commonly used in dyeing industries

<b>Chemicals &amp; Auxiliaries</b>	<b>Commonly used chemical with its trade name</b>
<b>Solubilizing Agent</b>	Urea
<b>Reduction Inhibitor</b>	Lyoprint RG or Resist Salt
<b>Alkali</b>	Caustic, Soda Ash, Sodium-bi-Carbonate
<b>Binding Agent</b>	Helizarin Binder ETS, Imperon Binder MTP
<b>Wetting Agent</b>	Cibaflow Pad, Kieralon A, Sandozin EH
<b>Dispersing Agent</b>	Setamol BL, Setamol WA, Dispersogen P
<b>Antifoaming Agent</b>	Antimusol SF, Leonil KS-U
<b>Anti-migrating Agent</b>	Irgapadol MP, Size CA, Alginate, Emigen AS-U
<b>Electrolyte</b>	Glauber Salt

**Table 1.2:** Commonly used dyeing chemicals in Bangladesh

<b>Chemicals &amp; Auxiliaries</b>	<b>Commonly used chemicals</b>
<b>Basic Chemicals</b>	Acetic Acid, Oxalic Acid, Soda Ash, Sodium Hypo chloride, Sulphuric Acid
<b>Bleaching Agent</b>	Hydrogen peroxide 50%
<b>Salt or Electrolytes</b>	Glubar salt, Common Salt, Refined Salt, Caustic Soda, Caustic Soda Pear
<b>Detergent &amp; Scouring Agent</b>	Invadine DA, Invatex CS, Cibafluid C
<b>Anti foaming/Penetrating Agent</b>	Cibaflow Winch, Cibaflow C, Antifoam TC, Primasol NF
<b>Anti creasing Agent</b>	Ciba fluid P, Ciba fluid C, Primasol Winch
<b>Peroxide Stabilizer</b>	Lavatex, Prestozen PL, Stabilol P, Tinoclarito G-100
<b>Sequestering Agent</b>	Ladiqueast 1097, Dekol SM, SirrixAKLiq
<b>Peroxide Killer</b>	Invatex PC, Lorinol PK, Basopal PK
<b>Reactive Fixing Agent</b>	Cibafix Eco, Tinofix FRD, Cycianon E
<b>Mercerizing Wetting Agent</b>	Mercerol QWLF, Leophen MC
<b>After Soaping Agent</b>	Cibapor R Liq, Sandopour RSK, Geiclean AW
<b>Enzyme Finishing Agent</b>	Bio polish AL
<b>Optical Brightener for Cotton</b>	Uvitex BBT, Uvitex CIDN, Uvitex BHV
<b>Optical Brightener for Polyester</b>	Ultraphore BN Liq, Uvitex BHT, Ultraphore SFG Liq, Ultraphore SFR
<b>Leveling Agent for polyester</b>	Baso Winch PEL, Osimol ROL, Uniperol EL, Prote-Gal DP505
<b>Decolourant For Effluent Treatment</b>	Colfloc RD

(Solanki, 2016)

Commonly used dyes in Bangladesh are:

- GTW- Red
- RET-Yellow 4GL
- RET- Orange - 3R
- Ind - Navy- WB
- RET-Black - B
- REMA Blue RR
- REMA Red RR
- Indo – Yellow - WHR
- REMA Yellow RR
- Sulphure Black
- Rea – Red - FR
- Ultra Yellow RGB
- Ultra Red RGB
- Ultra Navy RGB
- Indoflix Black DN
- IndoflixChry 1D
- Indoflix Red ME3BL
- GTW Pink
- Syno White 4BK

(Source : Collected from dyeing industries of Narayanganj)

## **1.8 Health risk associated with dyeing chemicals**

Some reactive dyes are recognized respiratory sensitizers. Breathing in respiratory sensitizers can cause occupational asthma and, once a person is sensitized, re-exposure to even very small amounts of the same dye may result in allergic symptoms such as a runny or stuffy nose, watery or prickly eyes, wheezing, chest tightness and breathlessness. Some



dyes can cause allergic skin reactions. Dyes are hazards to health. It is essential to read the safety data sheet supplied with each hazardous product.

Adding sodium hydrosulphite, also known as sodium dithionite or 'hydros' to process vessels can cause serious injuries. This generally happens when the substance has been added too quickly and has solidified into a plug. The reaction is often so violent it causes the contents to erupt over the side of the vessel (Bapco et al, 2016).

## Hazardous chemicals

**Table 1.3:** List of hazardous chemicals that commonly used in dyeing industries

<b>Substance</b>	<b>risk</b>
<b>o-anisidine</b>	Dermal (skin contact with printed packing and foils and dyed textiles) and oral (sucking on textiles); identified risk for consumers.
<b>Acrylonitrile</b>	Dermal
<b>Hydrogen peroxide</b>	Dermal, inhalation, oral; concerns for eye irritation/corrosivity during bleaching.
<b>Azodyes</b>	Skin irritation
<b>Sodium hydrosulphite</b>	Skin irritation
<b>Sodium Hypochlorite</b>	Skin irritant & corrosive. skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering
<b>Sodium hydroxide</b>	Corrosive, irritant, permeator. Skin contact can produce inflammation and blistering.
<b>Sodium carbonate</b>	Skin irritant
<b>Acetic acid</b>	Corrosive, irritant, permeator. Skin contact may produce burns.
<b>Sulfuric acid</b>	Corrosive, irritant, permeator. Skin contact may produce burns.
<b>Oxalic acid</b>	Skin irritant & permeator. Skin contact can produce inflammation and blistering.
<b>Sodium sulfate decahydrate</b>	Skin irritant & permeator.
<b>Stabilol P</b>	Easily inflammable. Heating causes rise in pressure - increased danger of bursting and explosion.

(Nijkamp et al, 2014)

## 1.9 Literature review

### Paper 1

**Title:** Asthma, rhinitis, and dermatitis in workers exposed to reactive dyes

**Name of the journal:** British Journal of Industrial Medicine

**Year published:** 1993

**Summary:** A survey was conducted at 15 textile plants with dye houses in western Sweden. Employees with a history of work related rhinitis, asthma, or skin symptoms were offered a clinical and immunological investigation including skin prick tests, skin patch tests, and radioallergosorbent tests (RASTs) to detect specific allergy to reactive dyes. Among the 1142 employees, 162 were given sensitivity to reactive dyes and 10 of these (6%) reported work related respiratory or nasal symptoms. An allergy to reactive dyes could be confirmed in five (3%, 95% confidence interval 1-7%).

### Paper 2

**Title:** Survey of occupational allergic contact dermatitis and patch test among clothing employees in Beijing

**Name of the journal:** BioMed Research International

**Year published:** 2017

**Summary:** They investigate the prevalence of occupational allergic contact dermatitis and to identify the causative allergens among clothing employees in China, a cross-sectional study was conducted in 529 clothing employees at 12 clothing factories in Beijing. All employees were subjected to an interview using self-administered questionnaire and skin examination, and those who were diagnosed with occupational contact dermatitis (OCD) were patch tested. In the present survey, we found that the overall 1-year prevalence of OACD among the clothing employees was 8.5%. The 1-year prevalence of OACD among workers (10.8%) was significantly higher than that among managers (3.2%).

### **Paper 3**

**Title:** Patch Testing with a textile dye mix in a baseline series in two countries

**Name of the journal:** ActaDermVenereol

**Year published:** 2011

**Summary:** The main aim of this study was to investigate the outcome of patch testing with a textile dye mix 6.6%. A total of 2,049 patients from Sweden and 497 from Belgium were tested with the mix, consisting of Disperse (D) Blue 35, D Yellow 3, D Orange 1 and 3, D Red 1 and 17, 1.0% each, and D Blue 106 and D Blue 124, 0.3% each. Of the total number, 65 patients, 2.6%, tested positively to the mix, 4.2% of the Belgian patients and 2.1% of the Swedish patients. Contact allergy to the mix was significantly more common in the Belgian than in the Swedish patients.

### **Paper 4**

**Title:** Textile dermatitis in patients with contact sensitization in Israel a 4-year prospective study.

**Name of the journal:** *JEADV*

**Year published:** 2004

**Summary:** Six hundred and forty-four patients (441 female and 203 male), referred for the investigation of contact dermatitis, and suspected of having textile allergic contact dermatitis (ACD), were studied. All patients were patch tested with the standard series (TRUE Tests), textile colour and finish series (TCFS) clothing extracts and pieces of garment in some cases. Readings were performed on days 2, 3 and in many patients also on day 7. Eighty-three patients (12.9%) had an allergic reaction to a dye and/or resin allergen.

## **Paper 5**

**Title:** Patch testing with textile allergens: the mayo clinic experience.

**Name of the journal:** Dermatitis.

**Year published:** 2012

**Summary:** They performed a retrospective review of results in patients who underwent patch testing using a series of textile dyes and resins from January 1, 2000, through September 30, 2011. A total of 671 patients (mean age, 56.5 years; female, 65.9%) were patch tested with the textile series (42 dyes and resins). These patients were also generally tested with the standard patch test series (n = 620). Of the patients, 219 (32.6%) demonstrated allergic reaction to 1 or more textile dyes and resins, and 71 (10.6%) manifested irritant reactions. The most frequent allergens were disperse blue 106 1% (8.3%), disperse blue 124 1% (8.0%), and melamine formaldehyde 7% (8.0%). Of patients tested with the standard series, 36 (5.8%) showed a positive reaction to the traditional textile screening allergen p-phenylenediamine 1%.

### **1.10 Aim of this project**

The aim of this project is to observe the prevalence of skin diseases in dyeing department of garment industries of Bangladesh. In addition, it was aimed to determine the health risk factors in the dyeing industries. Most of the dyeing workers are poor and uneducated or with minimum literacy. So they don't know which factors are responsible for their skin disease. The average dyeing company has not been actually found to care about the workers' health. Therefore, in this study we are looking for the responsible factors for causing skin diseases in the dyeing departments. The information will be helpful in finding out the factors related to the skin disorder and relevant safety procedures in garments department of textiles industries.

# **Chapter 2**

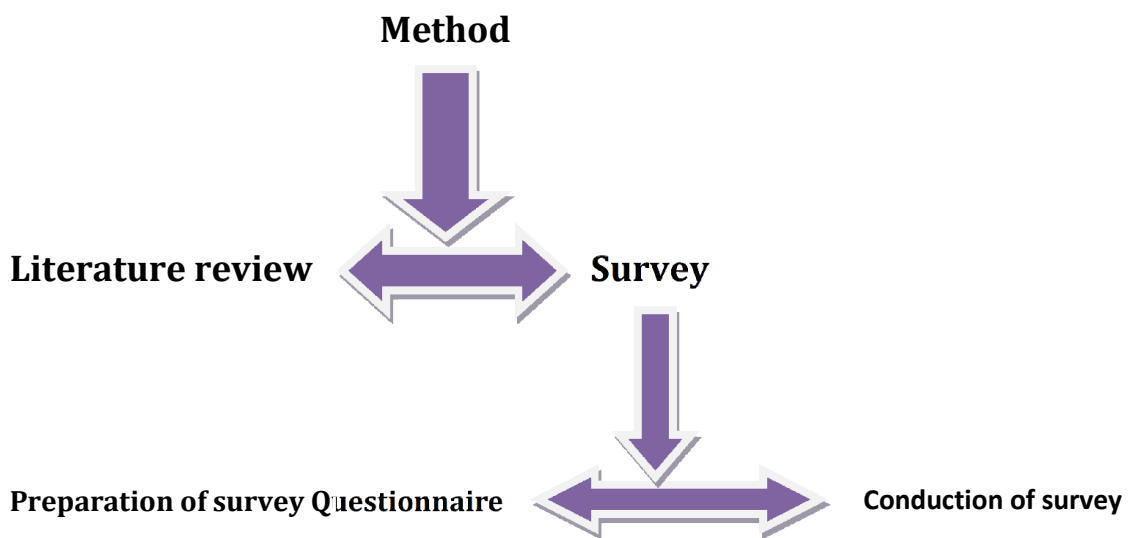
## **Method and Materials**

## 2.1 Materials

- Occupational skin disease based online papers, journals and articles were studied.
- The questionnaire was developed or modified from a model questionnaire based on Nordic Occupational Skin Questionnaire.
- People who work in the dyeing department of garment industries in Narayanganj of Bangladesh were the respondents.

## 2.2 Methods

The methods used to conduct the survey were summarized in Figure 1.



**Figure 2.1: Flow diagram of the methods used in order to conduct the survey on skin disorder of the people working in dyeing industries in Narayanganj**

### **2.2.1 Literature review**

- Searched journal articles in the google scholar and Pubmed using some key words, such as occupational skin disease, skin disease in dyeing industry, skin disease in textile, survey, Bangladesh, etc.
- The relevant papers were downloaded.

Then the papers were read carefully and found out the methods used to conduct such surveys.

### **2.2.2 Survey**

#### **Preparation of survey questionnaire**

The questionnaire was developed based on different findings in journals and research papers. Therefore, the questionnaire was developed by modifying a model questionnaire which was the Nordic Occupational Skin Questionnaire. The Questionnaire is attached in the appendix 1.

#### **Conduction of survey**

The data was collected based on the questionnaire written in English. People who work in the dyeing department of garment industries of Bangladesh (especially in industries situated in Narayanganj) were the respondents. At first oral consent was taken from the dyeing companies well as the workers working in the company. The data were collected by face to face interview. Due to the different levels of literacy, the questions were translated and explained to the workers in Bengali by myself. The answers of the question were also recorded by myself on the questionnaire while. I filled up the questionnaire according to



their answer/reply. A total of 130 individuals were interviewed. Ninety people were found to have skin disease and 40 people had no skin disease. People who had skin disease, were asked all the questions listed in the developed questionnaire. People who did not have skin disease, they were asked only personal information from the developed questionnaire.

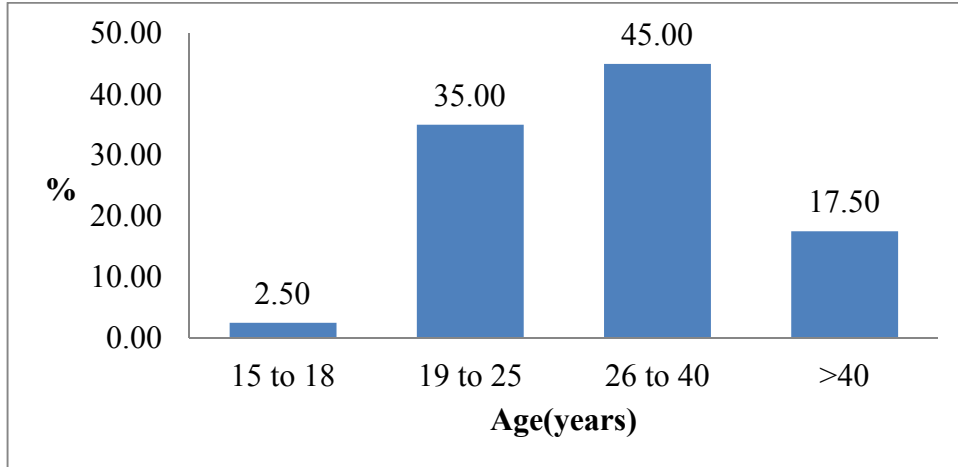
### **2.2.3 Data Analysis**

After collecting, all data were checked and analyzed in Microsoft Office Excel 2007. The data representation was performed by plotting in column diagrams and pie charts.

# **Chapter 3**

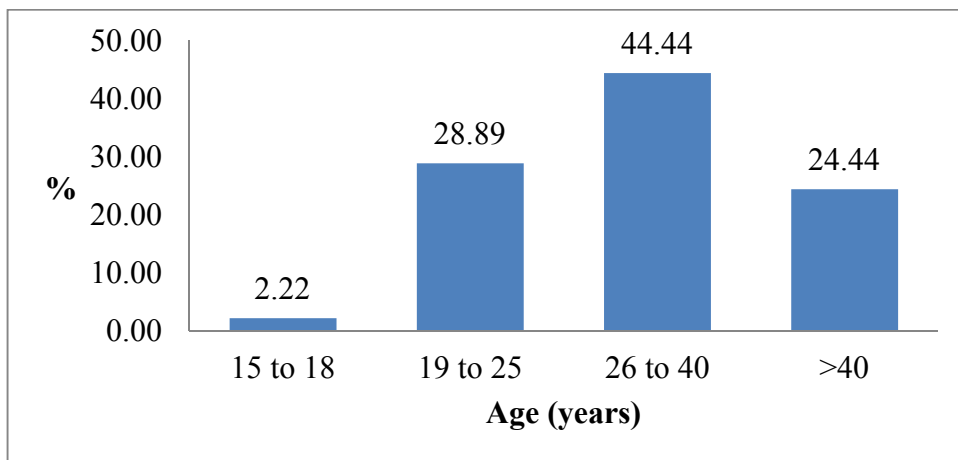
## **Results & Discussion**

### 3.1 Age range of the participants



**Figure 3.1.: Graphical representation of age range of the participants who did not have any skin disease**

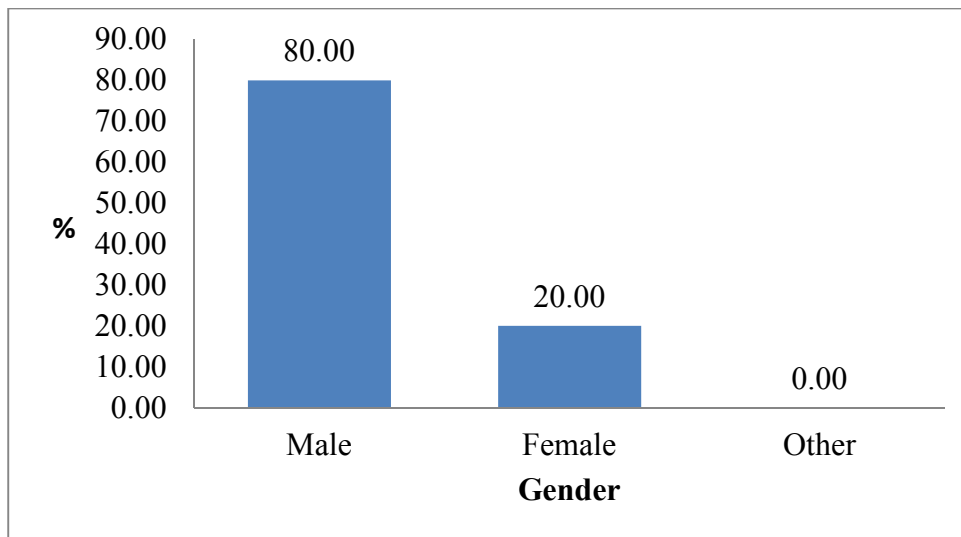
Among the population, the highest number of people was grouped into the range of 26 to 40 years and the least number of people were present in the range of 15 to 18 years.



**Figure 3.2: Graphical representation of age range of the participants who had skin disease**

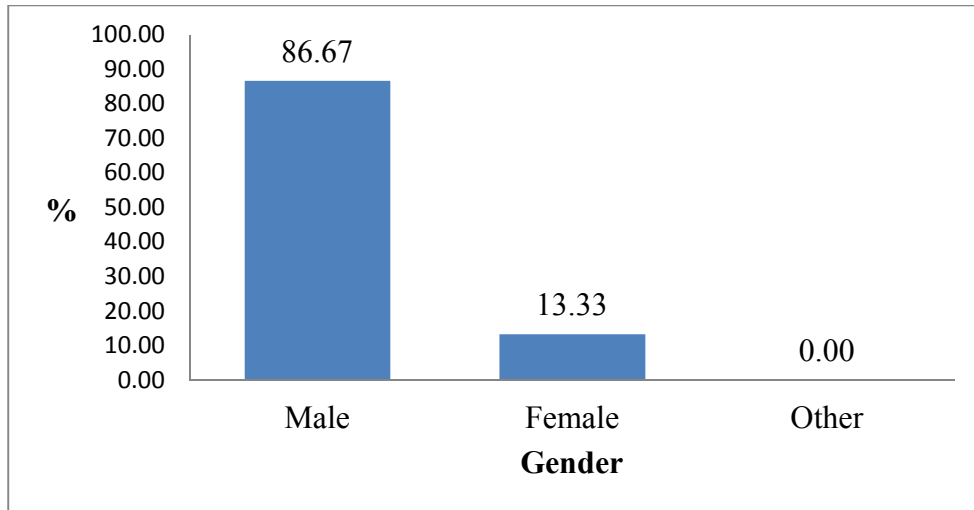
Among the population, the higher numbers of people who had skin disease were grouped into the range of 26 to 40 years and the least number of people were in the 15 to 18years range. From both figures it can be seen that most of the participants belong to 26 to 40years group.

### 3.2 Gender distribution of the respondents



**Figure 3.3: Graphical representation of gender of the participants who did not have any skin disease**

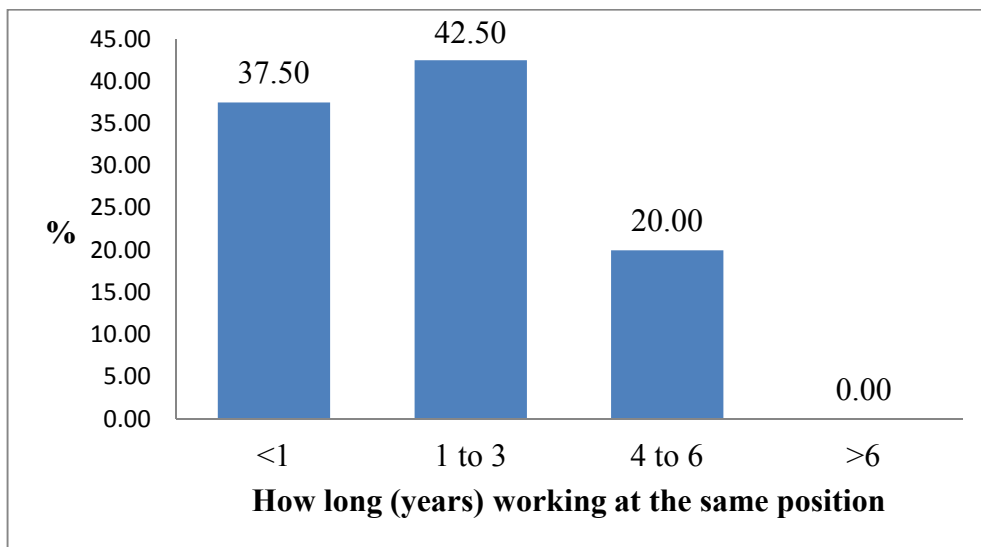
Figure 3.3 shows that 80% respondents were male and 20% respondents were female who did not have any skin disease.



**Figure 3.4: Graphical representation of gender of the participants who had skin disease**

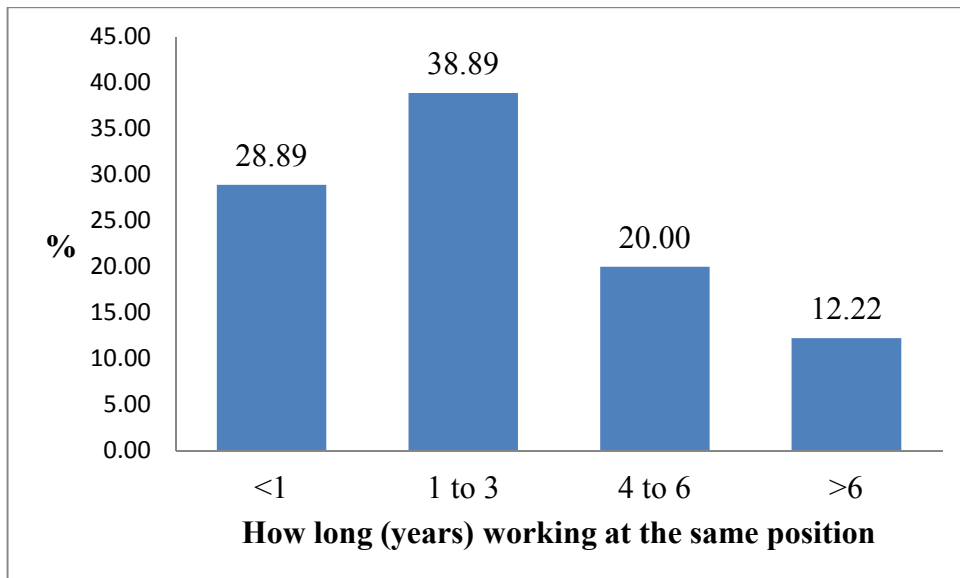
Figure 3.4 shows that 86.67% respondents were male and 13.33% respondents were female who had skin disease. Therefore, male participants tend to have more skin disease than female participants in the dyeing industries.

### 3.3 Duration of working at the same position



**Figure 3.5: Graphical representation of duration the participants working at the same position who did not have any skin disease**

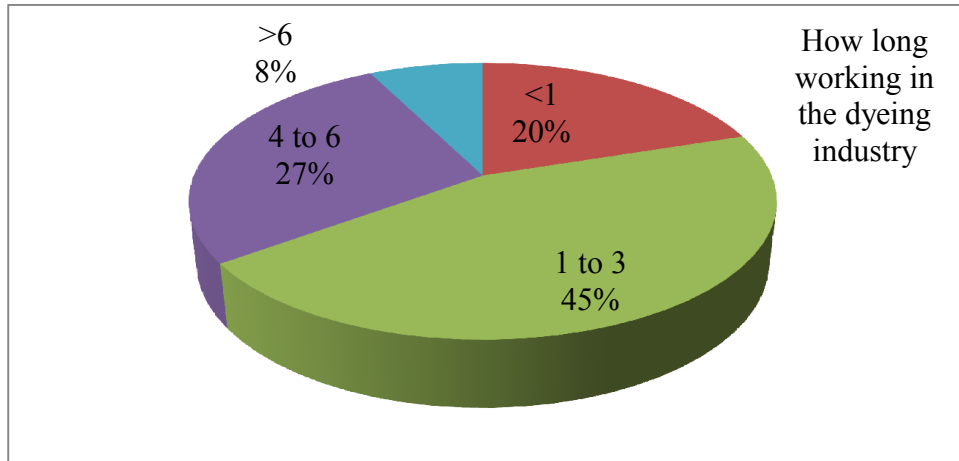
Figure 3.5 shows that most of the people who did not have skin disease in the industry worked up to 3 years at the same position in the industry. No response was observed for the people who worked more than 6 years in the same position.



**Figure 3.6: Graphical representation of duration of working at the same position of the participants who had skin disease**

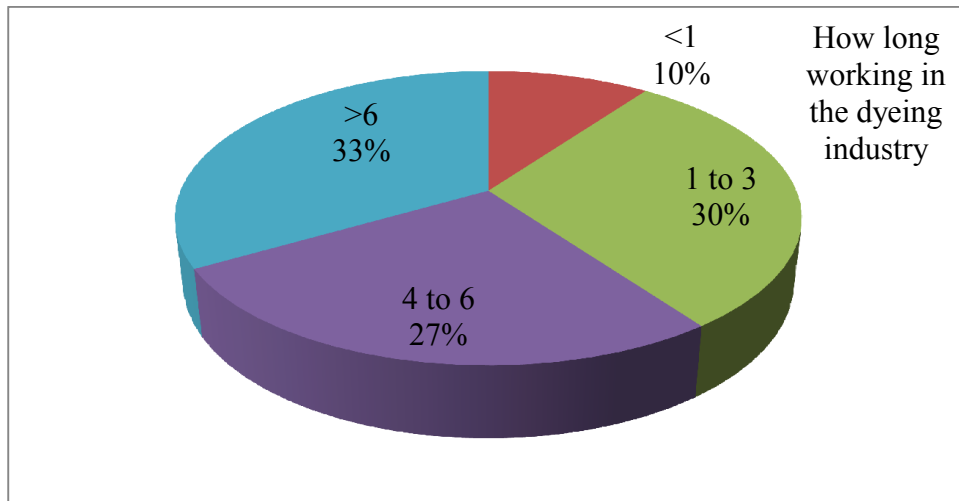
Figure 3.6 shows that people having skin disease mostly were working for 1 to 3 years in the same position. Compared with Figure 3.5, people tend to develop more skin disease when they worked longer in the same position. Therefore, about 12.22% people working in the same sector for more than 6 years had found to have skin disease.

### 3.4 Duration of work in the dyeing industry



**Figure 3.7: Pie chart showing the duration of working in the dyeing industry of the participants who did not have any skin disease**

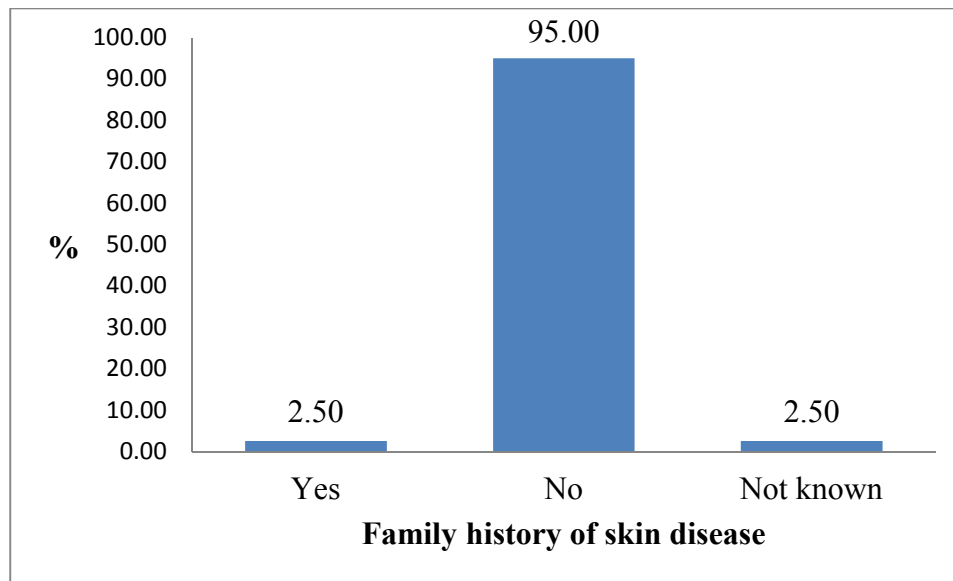
Most of the people (45%) who did not have skin disease worked 1 to 3 years in the dyeing industries (Figure 3.7). Only 8% people did not show any symptom of skin disease who were working more than 6 years in the dyeing industries.



**Figure 3.8: Pie chart of duration of working in the dyeing industry of the participants who had skin disease**

Figure 3.8 shows that on average people working longer in the dyeing industries from 1 to 6 years developed skin disease. Compared to Figure 3.7, approximately 4 times higher number of people (33%) responded to have skin disease who worked more than 6 years in a dyeing industry.

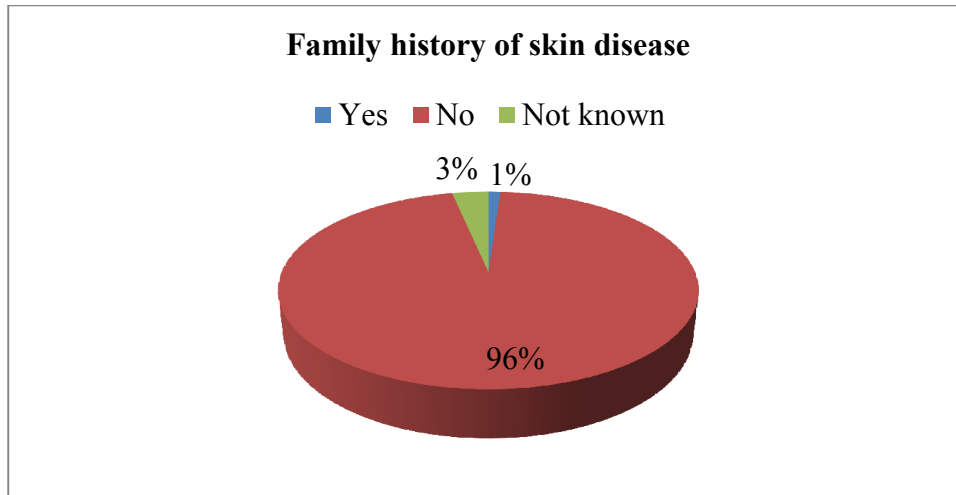
### 3.5 Family history of skin disease



**Figure 3.9: Graphical representation of family history of skin disease of the participants who did not have any skin disease**

Figure 3.9 represents that the majority respondents (95%) who did not have skin disease, also did not have any family history the same.

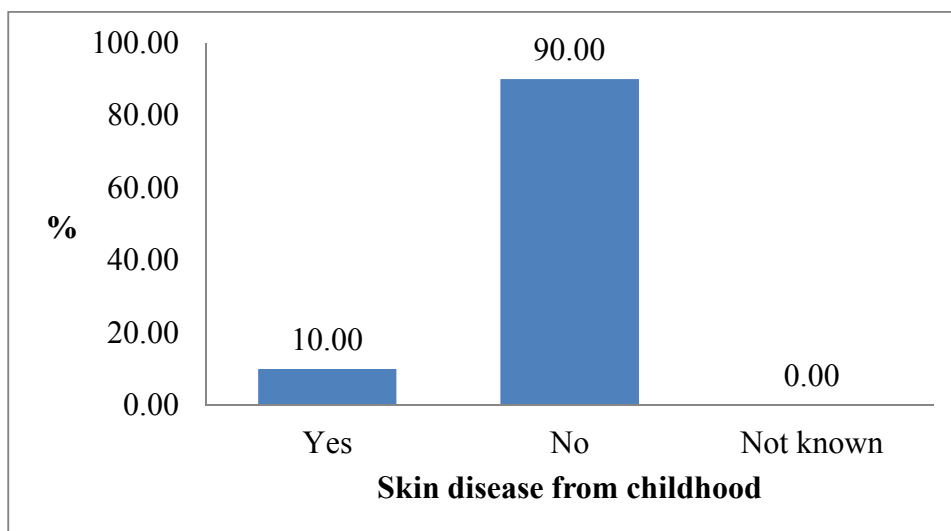




**Figure 3.10: Pie chart of family history of skin disease of the participants who had skin disease**

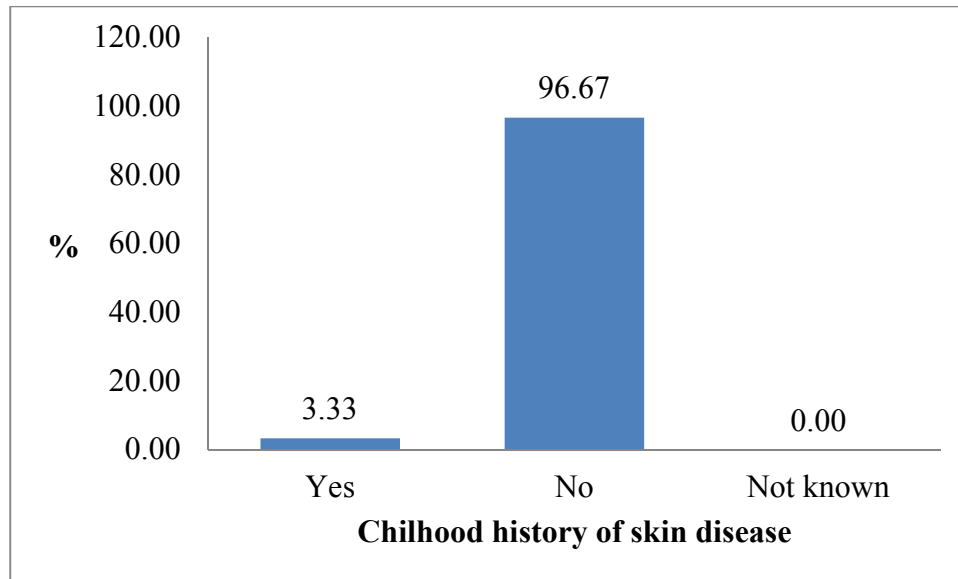
Similar to Figure 3.9, Figure 3.10 represents that people having skin disease did not have any family background of skin disease.

### 3.6 Skin disease from childhood



**Figure 3.11: Graphical representation of skin disease from childhood of the participants who did not have any skin disease**

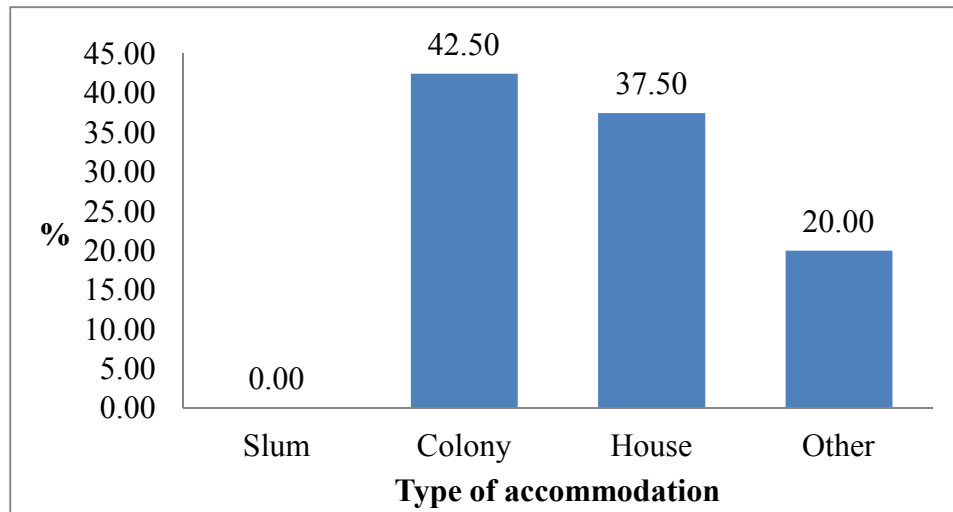
Figure 3.11 show that 90% of the participants did not have skin disease also did not show any symptom of skin disease in their childhood.



**Figure 3.12: Graphical representation of skin disease from childhood of the participants who had skin disease**

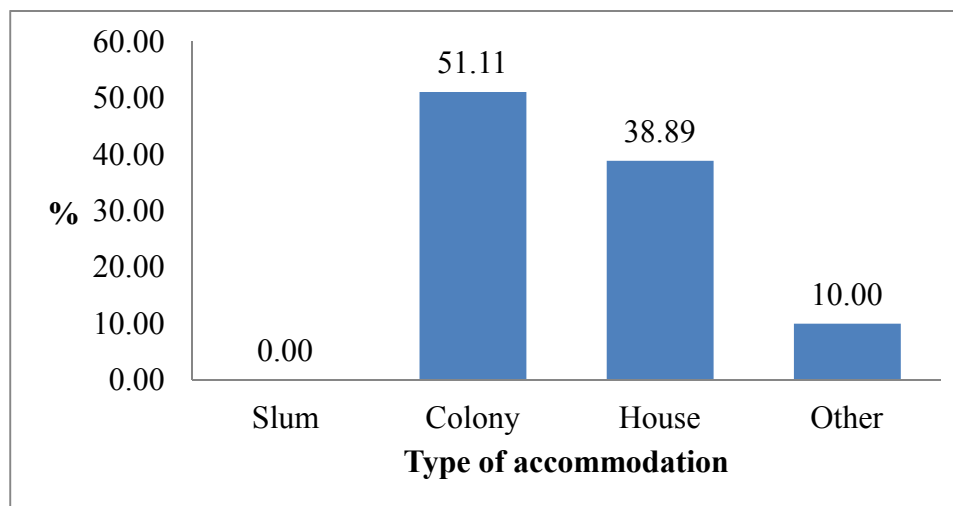
From Figure 3.12, it can be seen that most of the people (96.67%) did not have skin disease in their childhood who developed skin disease later in their life.

### 3.7 Type of accommodation



**Figure 3.13: Graphical representation of type of accommodation of the participants who did not have any skin disease**

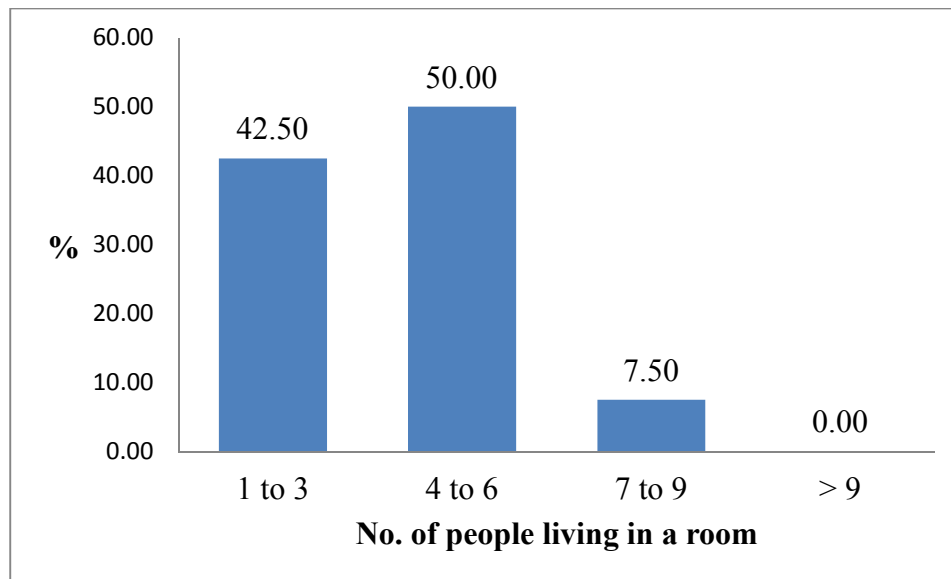
Figure 3.13 shows that the majority respondents who did not have skin disease lived in colony or houses. No respondents lived in slum.



**Figure 3.14: Graphical representation of type of accommodation of the participants who had skin disease**

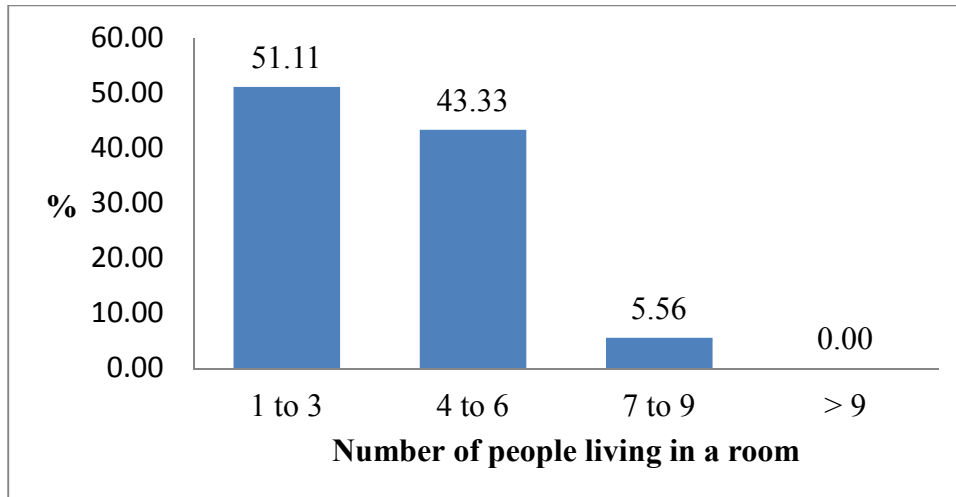
Similar to Figure 3.13, Figure 3.14 also shows that people having skin disease lived in either colony or houses and no one lived in the slum. Therefore, development of skin disease may not be due to the living standards of the participants.

### 3.8 Number of people living in a room



**Figure 3.15: Graphical representation of no. of people living in a room of the participants who did not have any skin disease**

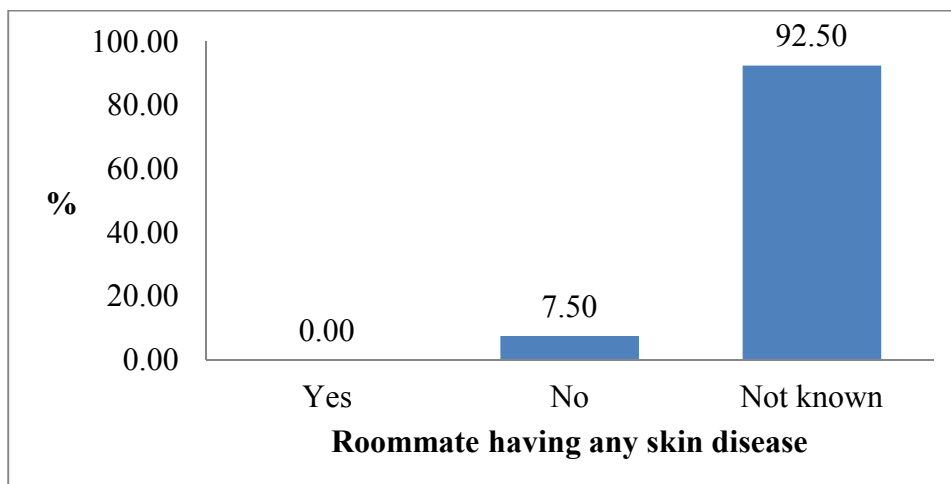
Figure 3.15 shows that 50% people lived in a crowded room (with 4 to 6 other people) but did not develop any skin problem.



**Figure 3.16: Graphical representation of no. of people living in a room of the participants who had skin disease**

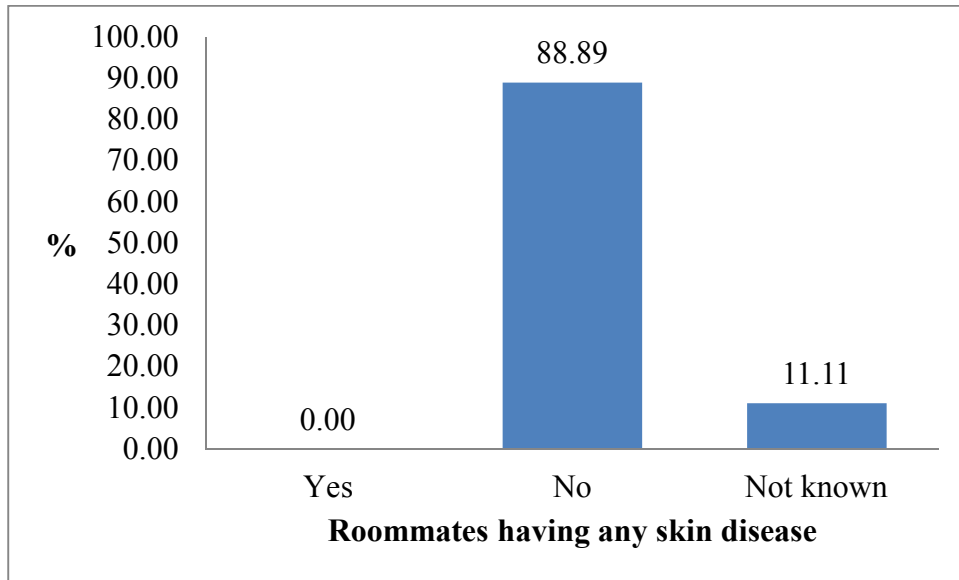
Unlike Figure 3.15, Figure 3.16 shows that although comparatively less number of people lived in the same room (1 to 3), 51.11% people developed skin disease. Therefore, development of skin disease may not be due to lying with too many people.

### 3.9 Roommate having any skin disease



**Figure 3.17: Graphical representation of roommate having any skin disease of the participants who did not have any skin disease**

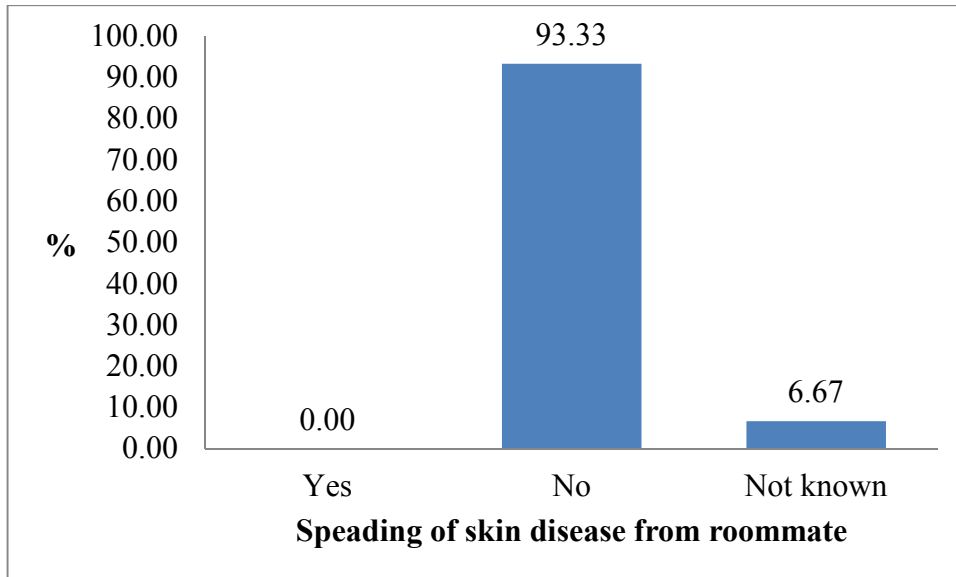
Figure 3.17 shows that people who did not have skin disease were not aware of their roommate's skin disease (92.50%).



**Figure 3.18: Graphical representation of roommate having any skin disease of the participants who had skin disease**

Figure 3.18 shows that 88.89% people having skin disease confirmed that their roommates did not have any skin disease. Therefore, people with skin disease may not be infected or transmitted by their roommates.

### 3.10 Spreading of skin disease from roommate



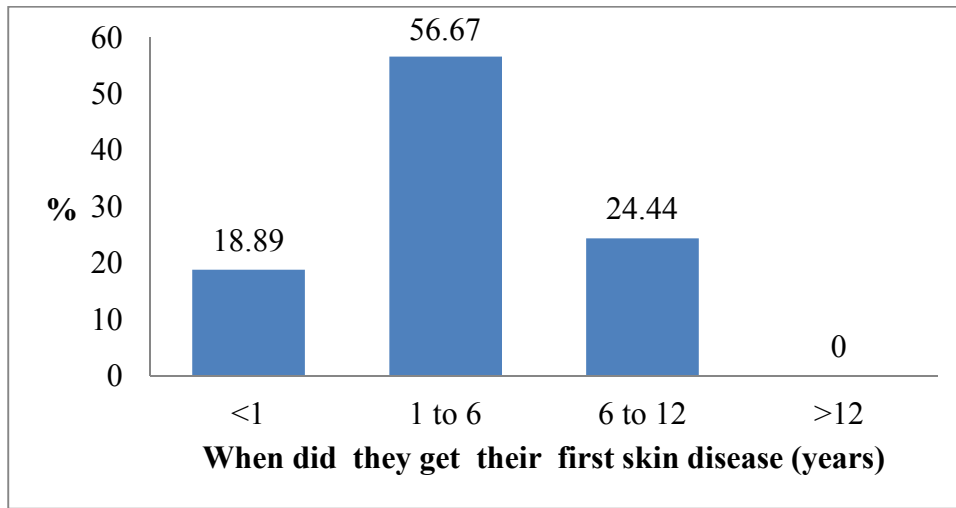
**Figure 3.19: Graphical representation of spreading of skin disease from roommate of the participants who had skin disease**

Figure 3.19 shows that 93% people having skin disease did not think that the disease was spread from their roommates.

### 3.11 Data representing the respondents who had or developed skin disease

In 130 respondents, 90 respondents had different types of skin disease. The majority of respondents had dry skin, dermatitis and hand eczema as well. Some respondents had dandruff, allergic reaction, cellulites etc. The rest of the questions were only asked to the people who had or developed skin disease in any time of their life. Therefore, section 3.12 to onwards represented the results that were obtained from the participants having skin disease

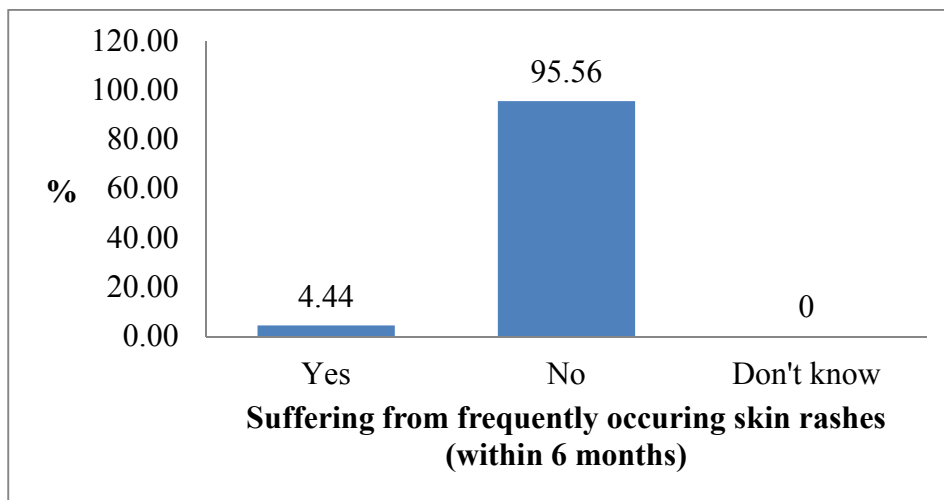
### 3.12 When they first got the skin disease



**Figure 3.20: Graphical representation of getting the skin disease for the first time**

Figure 3.20 shows that after starting their job in the dyeing industry, the majority of the respondents (56.67%) have got their skin disease within 1 to 6 years and 24.44% within 6 to 12 years. Only 18.89% got skin disease within 1 year of starting their job.

### 3.13 Frequency of suffering from skin rashes



**Figure 3.21: Graphical representation of frequency of suffering from skin rashes**

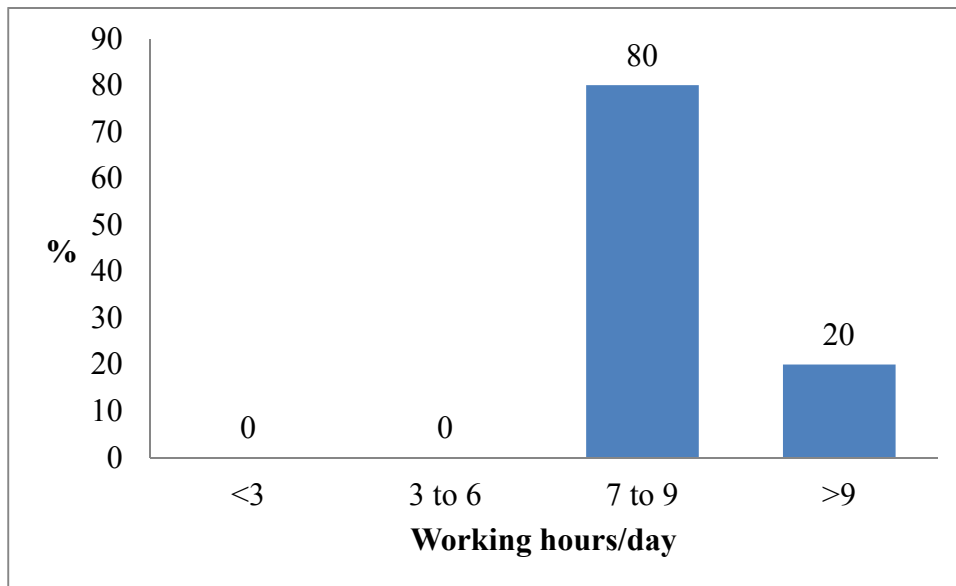


Figure 3.21 shows that the majority of respondents (95.56%) said that the skin rashes did not happen very frequently (within 6 months).

### 3.14 Hay fever, nasal allergic symptoms , eye allergic symptoms, asthma

All (100%) respondents did not have any of these symptoms.

### 3.15 Working hours per day



**Figure 3.22: Graphical representation of working hours per day**

Figure 3.22 shows that 80% people worked for 7 to 9 hours a day and 20%% worked more than 9 hours a day.

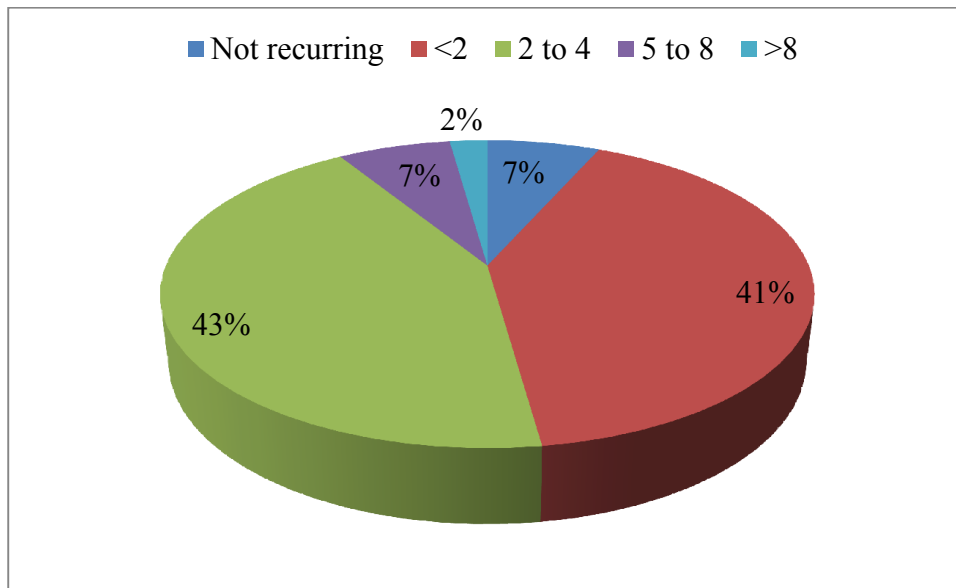
### 3.16 Symptoms of redness, dry, itchy skin etc. in the past 12 months

100%respondents said that they had either redness, dry or itchy skin in the last 12 months.

### 3.17 Part of the body where skin disease occurred

Here, the majority respondents had skin disease in their hand & leg. Skin disease was less reported in the other part (e.g. face, forehead, genital area) of their body by the respondents.

### 3.18 Frequency of recurring skin disease (weeks)



**Figure 3.23: Graphical representation of frequency of recurring skin disease (weeks)**

Figure 3.23 shows that 43% cases skin disease recurs within 2 to 4 weeks and 41% cases in less than 2 weeks time.

### 3.19 Possible reasons of starting the skin disease

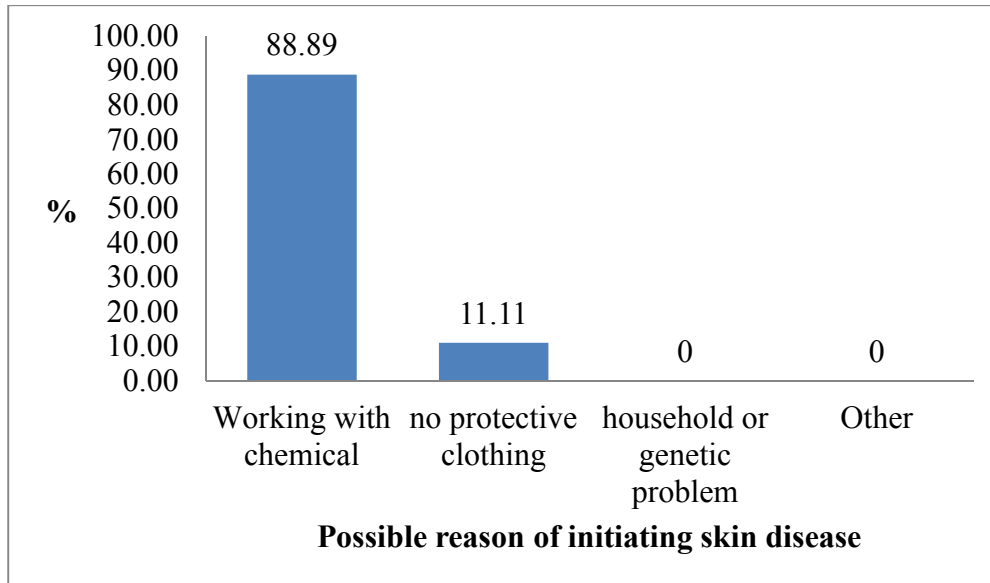


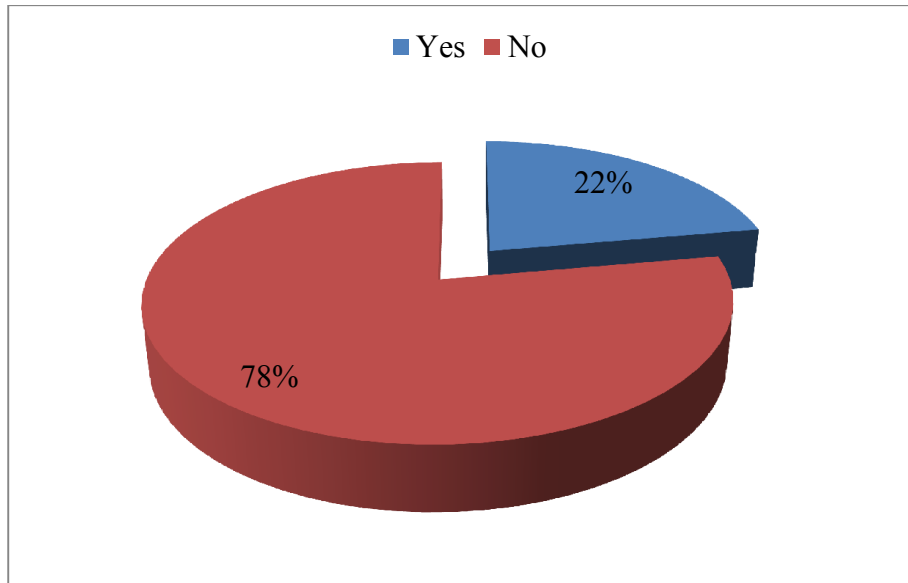
Figure 3.24: Graphical representation of possible reasons of initiating skin disease

Figure 3.24 shows that the majority respondents (88.89%) said that working with the chemicals was the main reason behind their skin disease. Some respondents said that because of not using protective clothing (such as gloves) during work was the reason of skin disease.

### 3.20 The occupation when skin disease started

The 100% respondents said that they were in the same job when their skin disease started.

### 3.21 Visited a doctor for skin disease



**Figure 3.25: Pie chart representing visiting a doctor for skin disease**

Figure 3.25 shows that, 22 percent respondents visited doctor because of their skin diseases and 78percentdid not. People who went to the doctor could barely remember the dosage form (tablet, ointment, cream) that prescribed by their physician or doctor.

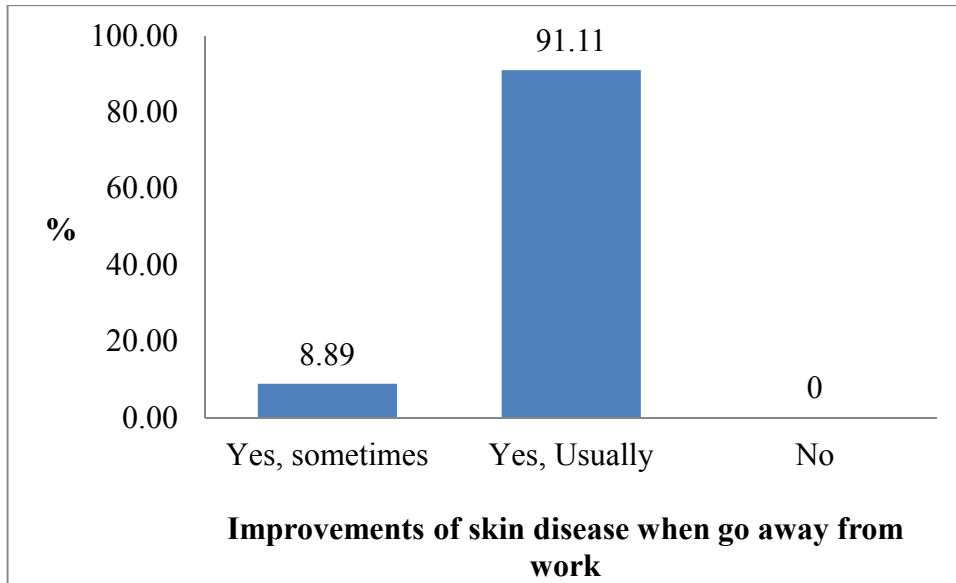
### 3.22 Things at work made the skin disease worse

The majority respondents said that working with the dyeing chemicals made the skin disease worse. Some respondents said that working without safety clothing were a responsible factor.

### 3.23 Thing outside the dyeing work made the skin disease worse

Here, the majority respondents answered that in their households, too much working with water or using soaps and shampoos made the skin disease worse.

### 3.24 Did skin disease improve when they went away from work?



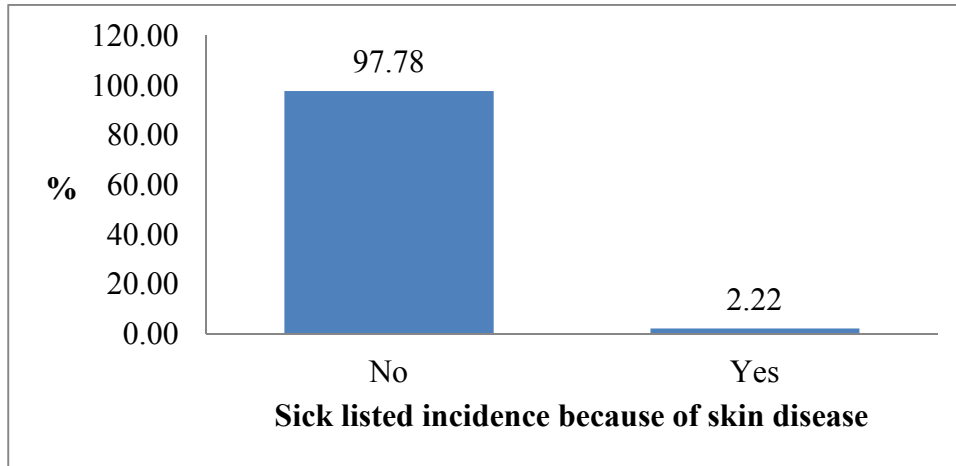
**Figure 3.26: Graphical representation of improvements of skin disease when go away from work**

Figure 3.26 shows that usually if they were away from the work, the skin condition gets better (91.11%).

### 3.25 Skin disease affected the work

Here, the 100% respondents said that they had to use gloves because of their skin disease.

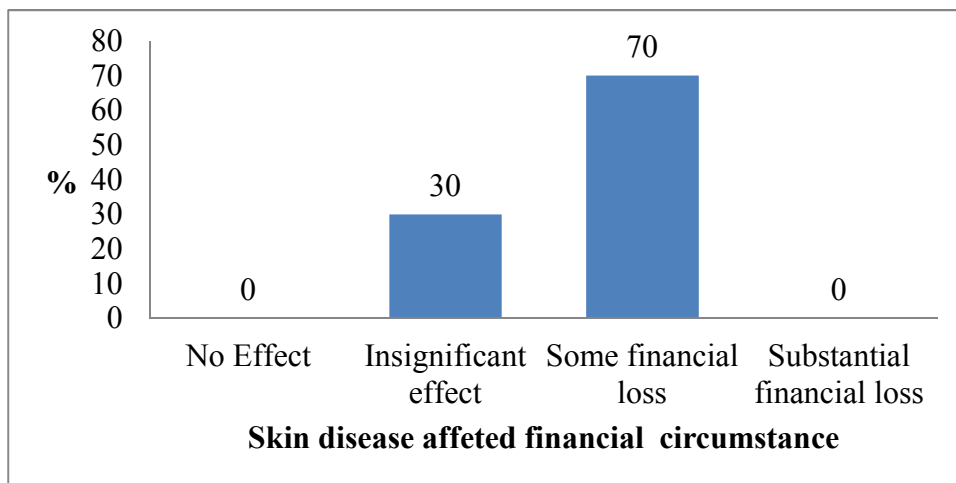
### 3.26 Sick listed or off to work because of skin disease



**Figure 3.27: Graphical representation of sick listed or off to work because of skin disease**

Figure 3.27 shows that 2.22 %respondents were either took sick leave or were absent in their work due to their skin disease.97.78% answered that they never took any day off because of their skin disease.

### 3.27 Negative influence on financial situation



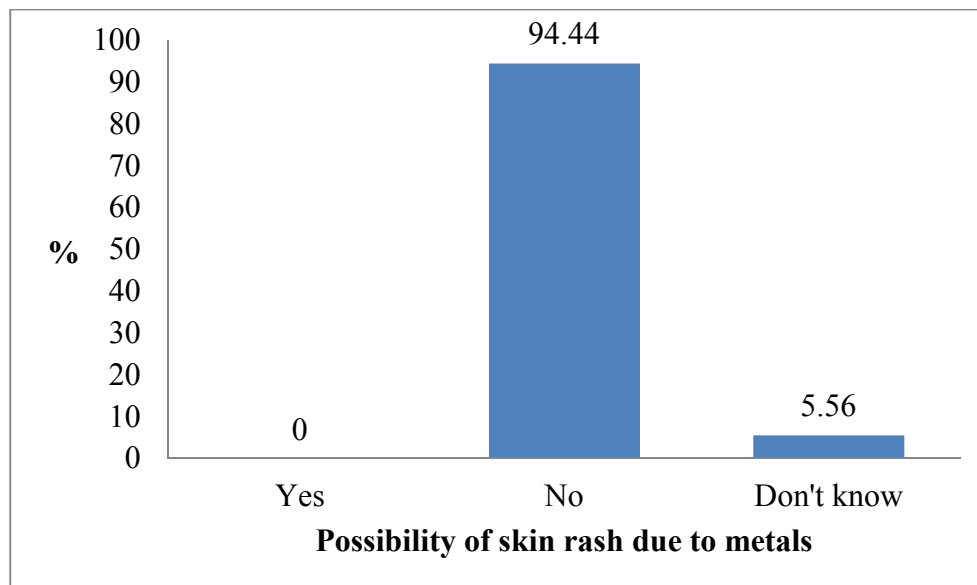
**Figure 3.28: Graphical representation of negative influence on financial situation**

Figure 3.28 shows that 70 percent respondents had some financial loss and 30 percent respondents had insignificant financial loss due to their skin disease which may involve not able to go to work or they had to buy medicine for the treatment of their skin disease.

### 3.28 Skin disease affected their lives in the last 12 months

Among the population, the majority respondent answered that their mood were mainly affected by their skin disease. Some respondents said that their daily activities and social activities also were affected because of their skin disease.

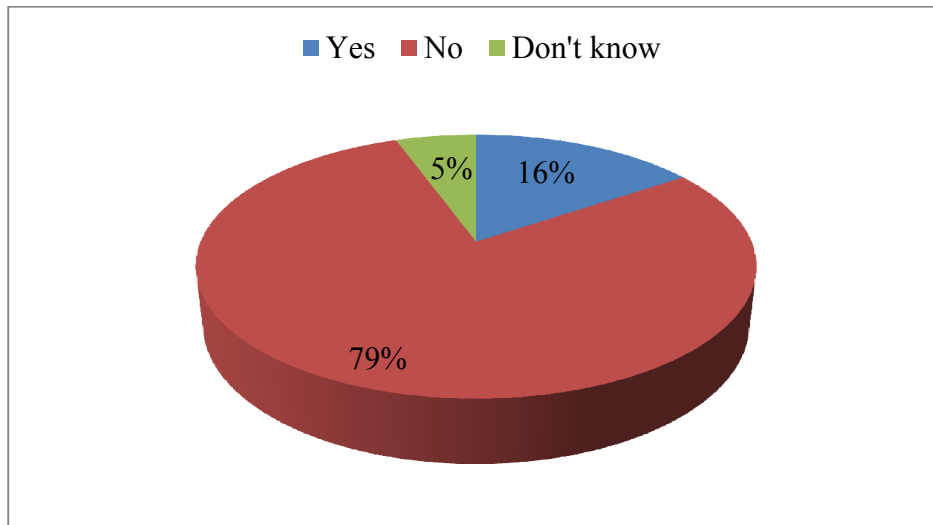
### 3.29 Skin rash due to metals



**Figure 3.29: Graphical representation of skin rash due to metals**

Figure 3.29 shows that 94.44% respondents said that they did not had skin rash due to metal buttons, metal fasteners, metal costume jewellery (for example earrings) or other metal objects. Only 5.56% respondents said that they had skin rash due to metal objects.

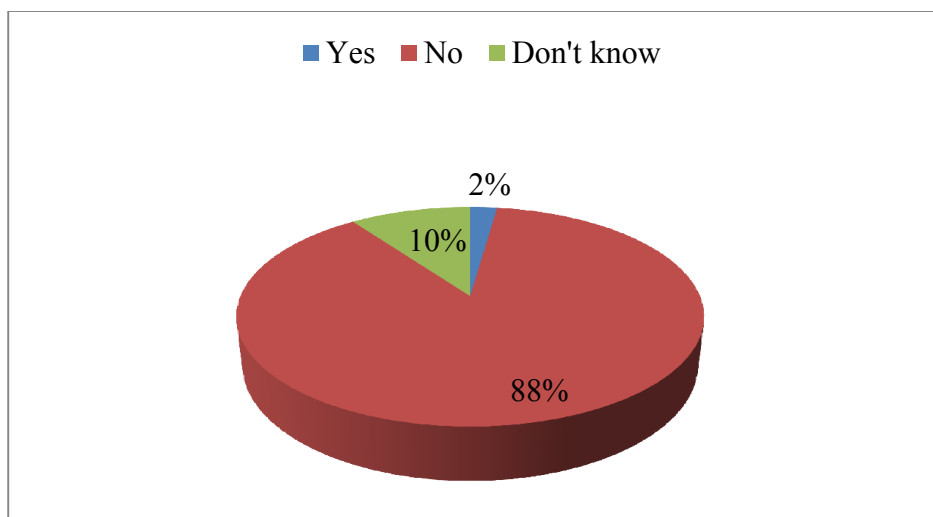
### 3.30 Having dry skin



**Figure 3.30: Graphical representation of having dry skin**

Figure 3.30 shows that 79% respondents did not have dry skin. 15 percent respondents had dry skin. Only a few 6 percent respondents did not know about this.

### 3.31 Skin itching when sweat

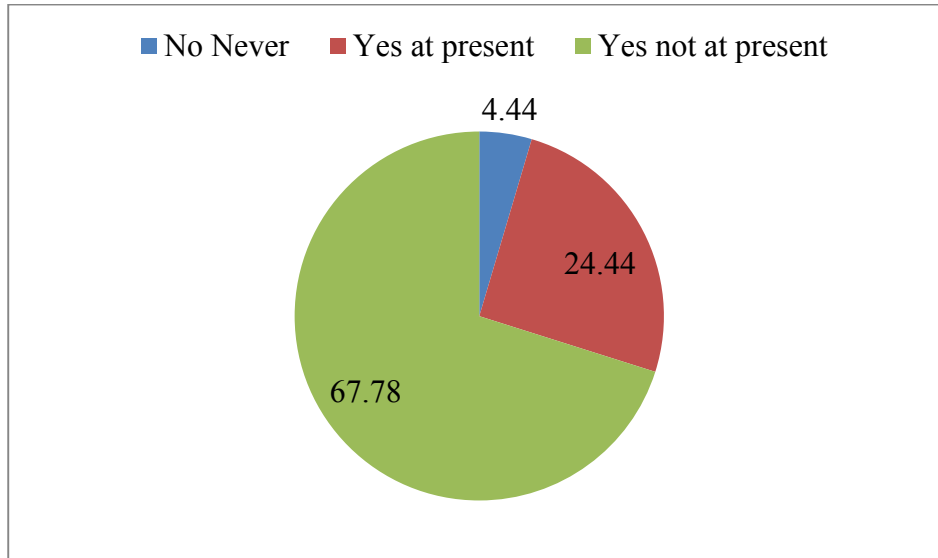


**Figure 3.31: Pie chart showing the frequency of skin itching due to sweat**



Figure 3.31 shows that 88% respondents did not experience itchy skin when they sweat. 10% respondents had experience itchy skin while sweating. Only 2% respondents did not know about this.

### 3.32 Use of protective gloves at work

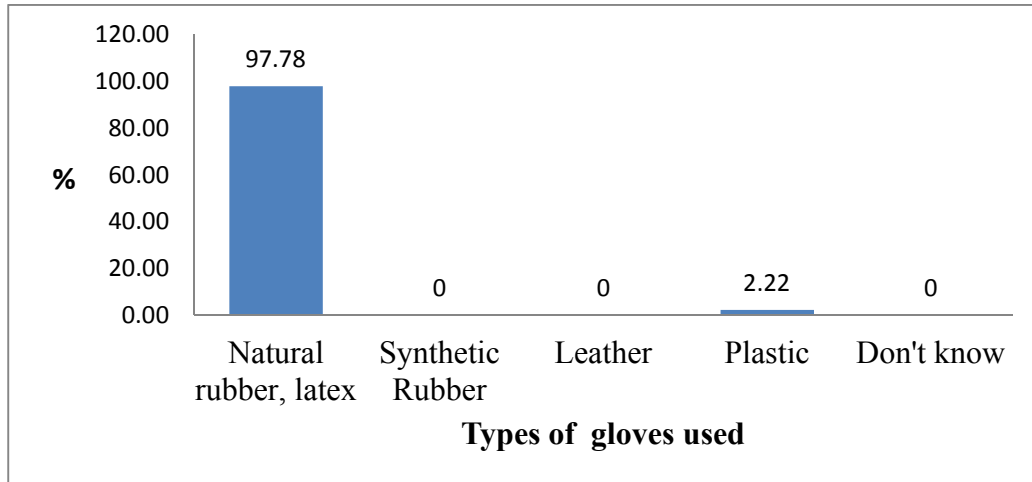


**Figure 3.32: Pie chart representing the use of protective gloves at work**

Figure 3.32 shows that 67.78% respondents usually wore protective gloves. However, they were not seen to wear protective gloves while they were surveyed. This was due to the limited number of protective gloves available in the industry. If their protective gloves destroyed, lost, ruined, they have to inform their in charge or supervisor to get a new protective gloves. But it takes long to arrive. So they had to share or alternatively used protective gloves at work.

Whereas, 24.44% respondents start wearing protective gloves recently. Only a few (4.44%) respondents never wore protective gloves at work.

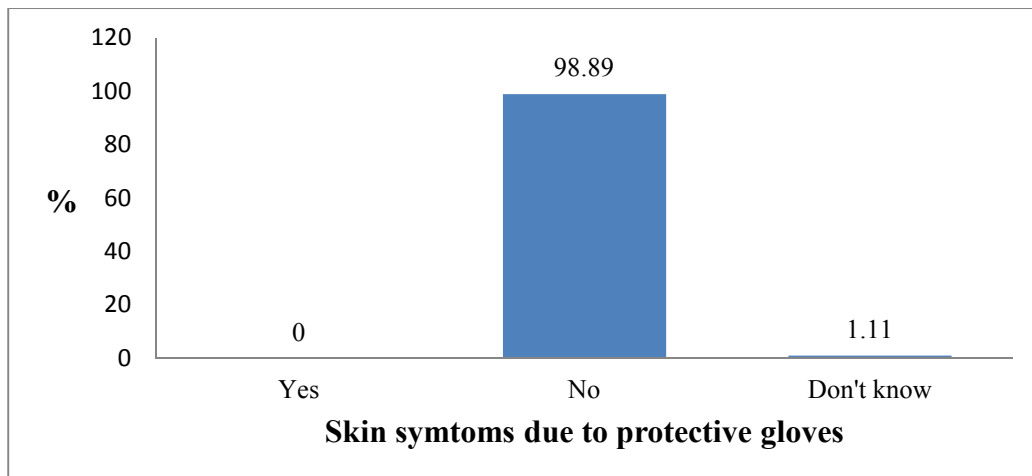
### 3.33 Type of gloves used at work



**Figure 3.33: Graphical representation of type of gloves used at work**

Figure 3.33 shows that 97.78% respondents used natural rubber or latex type of protective gloves at work. Only a few 2.22 percent respondents used plastic type of protective gloves.

### 3.34 Skin symptoms as a result of wearing protective gloves



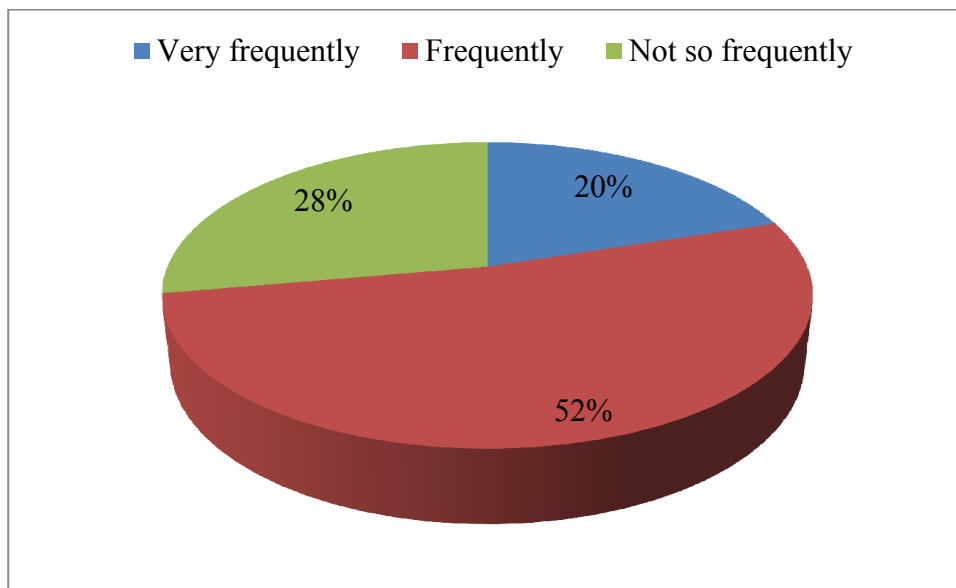
**Figure 3.34: Graphical representation of skin symptoms as a result of wearing protective gloves**

Figure 3.34 shows that 98.89 people did not have any skin symptom due to protective gloves.

### 3.35 Have changed or stop using gloves due to skin problem

Here, 100% respondents said that they did not have changed or stop using gloves due to skin problem.

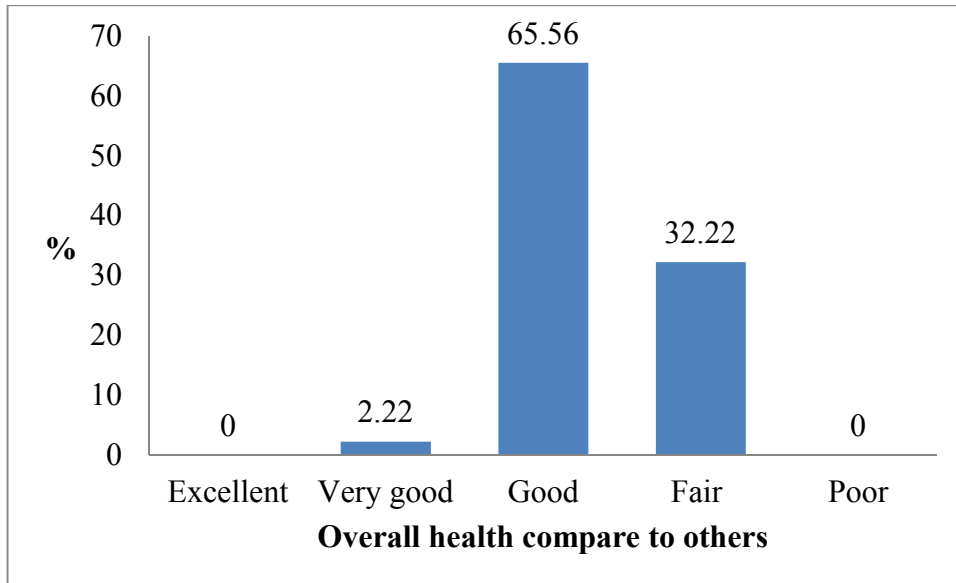
### 3.36 Washing hand per day at work



**Figure 3.36: Pie chart representing the frequency of washing hand in a day**

Figure 3.36 shows that 52% respondents said that they frequently washed their hands. 28% respondents said that they washed their hand very frequently. 20 percent respondents said that they washed their hand not so frequently. Therefore, their skin problem may be due to too much water contact.

### 3.37 Overall health compared to others



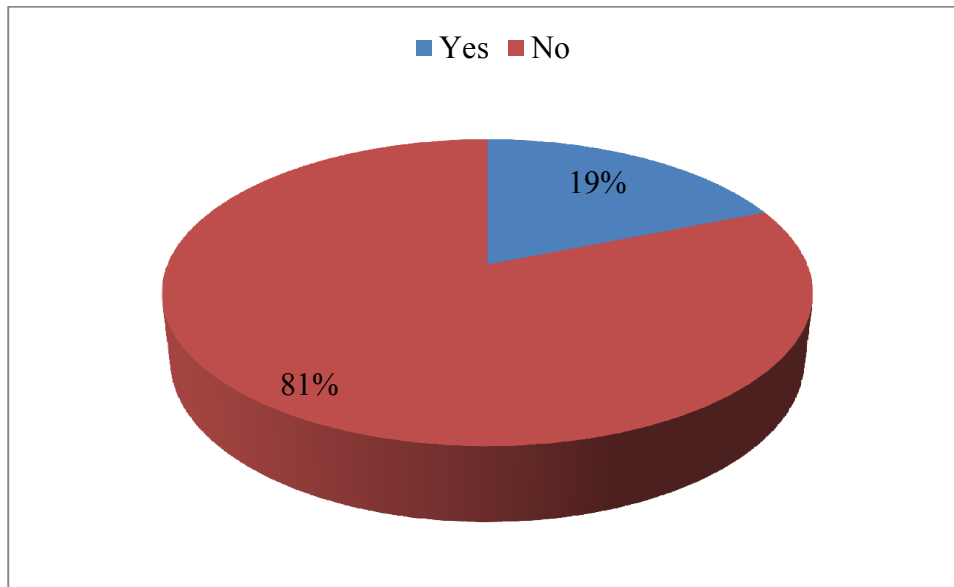
**Figure 3.37: Graphical representation of overall health of the participants**

Figure 3.37 shows that 65.56% respondents rated their health condition as good. 32.22% respondents rated their health condition as fair and only 2.22 % respondents rated their health very good.

### 3.38 Hours per day of activities outside of their work

The majority respondents said that they spend some time (approximately 0-0.5 hours) for washing or cleaning their cloths regularly. Some respondents said that they spend some time (approximately 1-2 hours) for preparing food and caring children regularly.

### 3.39 Inform inline manager about skin disease



**Figure 3.39: Pie chart representing informing in the line manager about the skin disease**

Figure 3.39 shows that only 19% respondents informed their line managers about their skin disease while most of the people (81%) did not inform. If some workers inform their line manager about the skin disease, they do not listen to him/her or suggest him/her to go to doctor for treatment. The company did not even bear the treatment cost of the workers. Therefore, most of the people did not feel the need to inform their line manager about their skin disease.

### 3.40 Had any safety training

Here, 100 percent respondents gave negative answer. In most cases the fresher usually suffered very much for this. They had to learn all the things from their seniors in their free times. Since everyone barely has free time, the fresher needed long time to learn all the safety things. There were no such official training facilities for them from the company.

# **Chapter 4**

## **Conclusion**

The objective of this study was to get a picture of overall condition of the prevalence of skin disease in the dyeing industry. This study concludes that the prevalence of skin diseases in dyeing department of garment industries in Narayanganj district of Bangladesh. Most of the dyeing workers are poor and uneducated or with minimum literacy. So they don't know the factors responsible for their skin disease. The authorities of most of the dyeing companies were actually not found to care about the workers' health. In this study we were looking for finding out the responsible factors for causing skin diseases in the dyeing departments. The information will be helpful in locating the factors related to the skin disorder and relevant safety procedures in dyeing department of textiles industries. From the present study it was seen that among 130 respondents 86.67% respondents were male and 13.33% respondents were female who had skin disease. Therefore, male participants tend to have more skin disease than female participants in the dyeing industries. From this study it was seen that people tend to develop more skin disease when they worked longer in the same position. The majority respondents did not have any family history of skin disease. Most of the people did not have skin disease in their childhood. Development of skin disease may not be due to the living standards of the participants. Therefore, people with skin disease may not be infected or transmitted by their roommates. In 130 respondents, 90 respondents had different types of skin disease. The majority of respondents had dry skin, dermatitis and hand eczema as well. Some respondents had dandruff, allergic reaction, cellulites etc. The majority of the respondents have got their skin disease within 1 to 6 years. All (100%) respondents did not have nasal allergic symptoms, eye allergic symptoms, asthma. 80% people worked for 7 to 9 hours a day and 20% worked more than 9 hours a day. 100% respondents said that they had either redness, dry or itchy skin in the last 12 months. Here, the majority respondents had skin disease in their hand & leg. Skin disease was less reported in the other part of their body by the respondents. From this study it was seen that working with the chemicals or using gloves for a long duration of period were the main reasons behind their skin disease. The 100% respondents were in the same job when their skin disease started. About 22 percent respondents visited doctor because of their skin diseases. People who went to the doctor could barely remember the drug and the dosage form (tablet, ointment, cream) that prescribed by their physician or doctor. From this study it was seen that usually if they

were away from the work, the skin condition gets better (91.11%). They had to use gloves because of their skin disease. Most of the participants never took any day off because of their skin disease. About 70 percent respondents had some financial loss and 30 percent respondents had insignificant financial loss due to their skin disease which may involve not able to go to work or they had to buy medicine for the treatment of their skin disease. Among the population, the majority respondent answered that their mood were mainly affected by their skin disease. Some respondents said that their daily activities and social activities also were affected because of their skin disease. Most of the participants did not had skin rash due to metal buttons, metal fasteners, metal costume jewellery (for example earrings) or other metal objects. About 15 percent respondents suffered from dry skin. About 88% respondents did not experience itchy skin when they sweat. From this study it was seen that 67.78% respondents usually wore protective gloves. However, they were not seen to wear protective gloves while they were surveyed. This was due to the limited number of protective gloves available in the industry. If their protective gloves destroyed, lost, ruined, they have to inform their line manager or supervisor to get a new protective gloves. However, as it takes long to arrive, they had to share or alternatively used protective gloves at work. Natural rubber or latex type of protective gloves was used mostly at the dyeing industries. Only a few percent respondents used plastic type of protective gloves. Most of the participants did not have any skin symptom due to protective gloves. They did not have changed or stop using gloves due to skin problem. From this study it was seen that respondents frequently washed their hands because they works with chemicals. Therefore, their skin problem may arise due to too much water contact. About 65.56% respondents rated their health condition as good, 32.22% respondents rated their health condition as fair and only 2.22 % respondents rated their health very good. Only 19% respondents informed their line managers about their skin disease while most of the people (81%) did not informed. If some workers inform their line manager about the skin disease, they do not listen to him/her or suggest him/her to go to doctor for treatment. The company did not even compensate the treatment cost of the workers. Therefore, most of the people did not feel the need to inform their line manager about their skin disease. Here, it is very unfortunate to say that 100 percent respondents did not had any safety training. In most cases the fresher usually suffered very much for this.



They had to learn all the things from their seniors in their free times. Since everyone barely has free time. Therefore, the fresher needed long time to learn all the safety things. There was no such official training facilities for them from the company.

# **Chapter 5**

## **References**

## References:

- Kabir, F. (2016) Historical Background of Garment Industry in Bangladesh. *Textile Aid*. [Online] Available from: <http://textileaid.blogspot.com/2014/06/historical-background-of-garment.html>. [Accessed 12 December 2017].
- Hasan, K., Mia, M., Rahman, M., Ullah, A., and Ullah, M. (2016) Role of Textile and Clothing Industries in the Growth and Development of Trade & Business Strategies of Bangladesh in the Global Economy. *International Journal of Textile Science*. [Online] 5(3). p.39-48. Available from: <http://article.sapub.org/10.5923.j.textile.20160503.01.html>. [Accessed 12 December 2017].
- Islam, M., Mahmud, K., Faruq, O. and Billah, M. (2011) Textile Dyeing Industries in Bangladesh for Sustainable Development. *ResearchGate*. [Online] Available from: [https://www.researchgate.net/publication/270279978\\_Textile\\_Dyeing\\_Industries\\_in\\_Bangladesh\\_for\\_sustainable\\_development](https://www.researchgate.net/publication/270279978_Textile_Dyeing_Industries_in_Bangladesh_for_sustainable_development). [Accessed 12 December 2017].
- Orsted, H., Keast, D., Lalande, F., Kuhunki, J., Jin, S., Haley, J. and Evans, R. (2016) Skin: Anatomy, Physiology and Wound Healing. *Wound Care Canada*. [Online] Available from: <https://www.woundscanada.ca/patient-or-caregiver/preventing-and-managing-wounds/basic-skin-physiology>[Accessed 12 December 2017].
- Hoffman, M. (2014) Skin problems and treatment. *WebMD*. [Online] Available from: <https://www.webmd.com/skin-problems-and-treatments/picture-of-the-skin#1>. [Accessed 12 December 2017].
- Stoppler, M., William, C. and Shiel J. (2017) Cellulitis. *MedicineNet*. [Online] Available from: <https://www.medicinenet.com/cellulitis/article.htm>. [Accessed 12 December 2017].
- Barua, P. (2012) Skin health in Bangladesh: An overview. *Indian J DermatolVenereolLeprol*. [Online] 78. p.133-4. Available from: <http://www.ijdv1.com/article.asp?issn=0378-6323;year=2012;volume=78;issue=2;spage=133;epage=134;aulast=Barua>. [Accessed 12 December 2017].

Agency. (2014) *Chemicals in textile*. [Online]. Sweden : Swedish Chemicals Agency. Available from: <https://www.kemi.se/files/8040fb7a4f2547b7bad522c399c0b649/report6-14-chemicals-in-textiles.pdf> [Accessed 12 December 2017].

Association. (2012) *Occupational Skin Disease – It is More Than Just a Rash*. [Online]. Canada : Public Services Health & Safety Association. Available from:<https://www.pshsa.ca/wp-content/uploads/2013/07/OIFFCAEN0313-Occupational-Skin-Disease-more-than-just-a-rash-English-HR.pdf> [Accessed 12 December 2017].

Solanki, U. (2016) Which chemicals are mostly used in textile industries? *Quora*. [Online]. Available from: <https://www.quora.com/Which-chemicals-are-mostly-used-in-textile-industries>. [Accessed 12 December 2017].

Bapco, J., Mensalis, K. and Grant, D. (2016) Common Occupational Disorders: Asthma, COPD, Dermatitis, and Musculoskeletal Disorders. *American Family Physician*. [Online]. 93(12). p.1000-1006. Available from: <https://www.aafp.org/afp/2016/0615/p1000.html>. [Accessed 12 December 2017].

Nijkamp, M. (2014) Hazardous substances in textile Products. *National Institute for Public Health and the Environment*. [Online]. p.2014-0155. Available from: [https://www.google.com/search?q=Hazardous+substances+in+textile+Products.National+Institute+for+Public+Health+and+the+Environment.&rlz=1C1CHBD\\_enBD746BD768&oq=Hazardous+substances+in+textile+Products.National+Institute+for+Public+Health+and+the+Environment.&aqs=chrome..69i57.716j0j7&sourceid=chrome&ie=UTF-8#](https://www.google.com/search?q=Hazardous+substances+in+textile+Products.National+Institute+for+Public+Health+and+the+Environment.&rlz=1C1CHBD_enBD746BD768&oq=Hazardous+substances+in+textile+Products.National+Institute+for+Public+Health+and+the+Environment.&aqs=chrome..69i57.716j0j7&sourceid=chrome&ie=UTF-8#). [Accessed 12 December 2017].

Ryberg, K., Goossens, A., Isaksson, M., Zimerson, E. and Bruzel, M. (2011) Patch Testing with a Textile Dye Mix in a Baseline Series in Two Countries. *Acta Derm Venereol*. 91. p. 422–427. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/21547346>. [Accessed 12 December 2017].

Chen, Y., Gao, B., Cheng, H. and Lin, L. (2017) Survey of Occupational Allergic Contact Dermatitis and Patch Test among Clothing Employees in Beijing. *Hindawi BioMed*

*Research International*. 3102358. p.10. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28396866>. [Accessed 12 December 2017].

Nilsson, R., Nordlinder, R., Wass U., Meding, B. and Belin, L. (1993) Asthma, rhinitis, and dermatitis in workers exposed to reactive dyes. *British Journal of Industrial Medicine*. 50.p. 65-70. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1061236/>. [Accessed 12 December 2017].

Lsaksson, M., Ryberg, B., Goossens, A. and Bruze, M. (2015) Recommendation to include a textile dye mix in the European baseline Series. *Contact Dermatitis*.73. p.15–20. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/25925831>. [Accessed 12 December 2017].

Wentworth, A., Richardson, D. and Davis, M. (2012) Patch testing with textile allergens: the mayo clinic experience. *Dermatitis*. 23(6). p.269-74. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23169208>. [Accessed 12 December 2017].

Singhi, M., Menghani, P., Gupta, L. and Kachhawa, D. (2005) Bansal MOccupational contact dermatitis among the traditional 'tie and dye' cottage industry in Western Rajasthan. *Indian J Dermatol Venereol Leprol*. [Online]. 71(5). p.329-32. Available from: <http://www.ijdvl.com/article.asp?issn=0378-6323;year=2005;volume=71;issue=5;spage=329;epage=332;aulast=Singhi>. Available from: [Accessed 12 December 2017].

## Sample Survey Questionnaire

**Title of the survey:** Prevalence of skin diseases in dyeing department of garment industries of Bangladesh.

**Type of people who will participate in this survey:** People who work in the dyeing department of garment industries of Bangladesh.

**Industry surveyed:**

**Name of the participant and signature (if possible):**

**Date:**

Due to the different level of literacy, the questions were translated and explained to the people in Bengali by the survey conductor, Ms. Noor Nahar. The answers of the question were also recorded by the survey conductor on the questionnaire while surveying them.

### Personal information

1. Name \_\_\_\_\_

2. Age \_\_\_\_\_

- a. 15-18                      b. 18-25                      c. 25-40                      d. > 40

Please specify.....

3. Gender \_\_\_\_\_

- a. male                      b. female                      c. other

4. Name of the company \_\_\_\_\_

5. Workplace \_\_\_\_\_

6. Post/ position \_\_\_\_\_

7. How long working in the same position?

- a. < 1 year                      b. 2-3 years                      c. 3-5 years                      d. > 5 years

Please specify \_\_\_\_\_

8. How long (total including other jobs) have you been working in dyeing industries?

- a. < 1 year                      b. 2-3 years                      c. 3-5 years                      d. > 5 years

Please specify \_\_\_\_\_

9. Major activity at current work \_\_\_\_\_