CHAPTER I
INTRODUCTION

Textile industry is the second largest industry in the world next to agriculture. Indian textile industry is one of the leading textile industries in the world and contributes nearly 14 per cent of the total industrial production of the country. It also contributes around 3 per cent to the GDP of the country and contributes substantially to the foreign exchange earned by the country. In India, textile industry is also the largest in the country in terms of employment generation, currently of generates employment to more than 35 million people (Pandey, 2010).

Industrialization is necessary for prosperity and at times for the survival of a nation. Production is the real wealth of a nation. Only initialization is not enough, real benefit is brought by continuous top performance of the workers which is only possible by their good health. Industrial workers constitute only a segment of general population and the factors that influence the health of population also apply equally to industrial workers (Jaiswal, 2007).

Textile industry is one of the major growing industries for export purpose and which require large number of workers. The textile industry is providing employment to numerous people in the country, but the emphasis on awareness about the environmental concern such as air, water and noise pollution during the processing from fiber to fabric is essential in the present circumstances (Senthilkumar, 2008).

Occupational health is branch of community medicine which deals with the effects of occupation of work place on human health (Park, 2009). Every occupation is associated with one or the other ill effects on health, one such occupational group is cotton textile workers (Hunter, 2000).
Ginning factory includes the sorting house, gin house and gutter section. Sorting involves the sorting of cotton according to quality. The seeds are separated from cotton in the gin house and collected in gutter (Jannet and Jayanthi, 2006).

In blow-room where the cotton bales are opened and cleaned, the dust levels are very high. Here the cotton is vigorously beaten several times to separate impurities, then in the carding section, the laps of cotton are drawn on a machine so that dust leaves, twigs etc can be separated. In this process, a lot of cotton dust is released in the carding room. The next stage of work is done in the spinning shed where the dust levels are also high (Dogra, 2004).

Cotton is a natural fiber used in production of cloth. When cotton is being processed it emits fine dust particle into the air. These particles are breathed into the lungs by the person working with the fiber and develop a permanent decrease in their breathing ability. The cotton dust related disease is known as brown lung (or) byssinosis and affects thousands of people in the textile industry who are exposed to large quantity of dust (Chrostek, 2004).

Textile dust enters the body by inhalation and fine dust containing fibers may be deposited in the alveoli. The fibers are insoluble. The dust deposited in the lung cause fibrosis, pleural plaques, bronchitis and lung cancer. Textile dust results in impaired lung function after long period of exposure. The symptoms are shortness of breath, chest pain and later bronchitis with increased sputum (Jaiswal, 2007).

Textile workers are exposed to airborne particulate from natural and synthetic fibrous material in their work environment (Oldenburg et al, 2007). Exposure to cotton dust in the textile industry has been associated with several work- specific and nonspecific respiratory symptoms (Wang et al, 2003).
Inhalation of dust is an important cause of interstitial lung disease in the tropical countries, such as India. The ocular and nasal irritation, byssinosis chronic bronchitis, persistent cough, non byssinotic work related chest tightness are being the most common symptoms complained by both cotton and synthetic fibre textile workers and the prevalence rate was higher among cotton workers than synthetic fibre textile workers (Jindal, 2001).

Industrial workers exposed to cotton dust have an allergic reaction which is similar to asthma attack. The allergic reaction causes the small airways in the lungs to contract so air cannot quickly leave the lungs. Any air that is already in the lungs at the time of attack has to force its way out of the body through narrowed lung passages which in turn produces wheeling sounds that are common during asthma attack (Gunnusdottir and Tomasson 2004).

The occurrence of respiratory symptoms represents the earliest response to cotton dust exposure followed by lung function changes. Early symptoms may be a risk factor for subsequent loss of pulmonary function in cotton textile workers (David, 2002). It leads to some systemic symptoms in exposed workers along with a number of other physical problems like hearing loss or noise problem, low back pain, respiratory symptoms and pulmonary function (Jaiswal, 2007).

Cotton textile women workers aged 35 years and above, who worked for 10 years in the noisy department prone to hypertension. Seventy per cent of the subjects were found to have raised systolic (or) diastolic blood pressure (Tiwai et al, 2003).

Cotton textile workers are susceptible to various respiratory morbid conditions, by virtue of work place and working condition are at risk of suffering from various chronic respiratory illness like byssinosis, chronic bronchitis due to exposure to the cotton dust in the work sites (Hunter, 2000).
Cotton dust when breathed in irritates the lungs and exposed workers experience the following symptoms, difficulty in breathing, chest tightness coughing and wheezing (Ziziya, 2002).

Occupational disease reflects health hazards brought as by exposure in the work environment. Due to lack of education, unaware of hazards of their occupation, general backwardness in the sanitation, poor nutrition and climatic proneness of this geographic region to epidemic aggravate their health hazards from work environment (Wang et al, 2003).

Musculoskeletal problems (69.4 per cent) were the commonest health problem. The body area commonly affected was neck (64.10 per cent) low back (41.03 per cent), hand (51.02 per cent), wrist finger (23.01 per cent), and shoulder (68.05 per cent). The common symptoms were pain (69.23 per cent), weakness (38.46 per cent) and stiffness (23.08 per cent) of the affected parts among the textile women workers (Haglind et al, 2002).

Other morbidities that detected among cotton textile women workers were generalized weakness (14.29 per cent) acidity and heart burn (26.79 per cent) menstrual problem (5.36 per cent), insomnia (2.5 per cent) injury (9.8 per cent) anaemia (89 per cent) angular stomatitis (14. 29 per cent) odema (7.14 per cent) hypertension (16.07 per cent) and malnutrition (37.50 per cent) (Guo et al, 2004).

Today is an era of women who have diverse role to play in society. Often they handle two (or) more tasks simultaneously. They are therefore prone to suffer from work-related diseases which are further complicated by social, psychological and physiological issues. Nutritional and respiratory status is related in a variety of ways malnutrition either in isolation (or) as the result of acute or chronic illness impair the respiratory function by weakening diaphragmatic contraction. The link between diet and the pulmonary system is
especially clear in patients with limited respiratory reserve and \( \text{CO}_2 \) retention (Charbel, 2010).

Malnutrition can cause anaemia due to deficits of haemoglobin molecules, RBC and the patient with low haemoglobin count experience weakness affecting all muscles including those used for breathing (Web, 2000). Nutritional depletion in workers with respiratory disease is common and it has a negative impact on respiratory and peripheral muscle function. Therefore, assisting patients with respiratory disorder to attain and maintain optimal nutritional status is critical to enhance their physical well being and function (Raherison et al, 2009). It is important that people with respiratory disease should eat good source of protein at least twice a day to help to maintain strong respiratory muscle (Romieu, 2011).

Despite steady gains through 20\(^{th}\) century in the field of nutrition more than one billion of people are ill (or) disabled as a result of micronutrient deficiency and over 2 billion people are at risk. Illness and condition brought about by micronutrient deficiency include depression, dementia, low work capacity and loss of bone and muscle strength. These conditions, many of which are reversible directly affect the health of employee and their work performance quality. Thus an adequate supply of micronutrient for the workforce is paramount. Iron deficiency anemia affects hundreds of million workers (Haos and Brown lie 2001). Anaemia and milder level of iron deficiency decrease physical work capacity and productivity in repetitive task, yet can be inexpensively remedial by supplementation. The main micronutrient deficiencies are iron and iodine. Other deficiency include folic acid, vitamin B6 and vitamin C (Merchant et al,2006)

Anaemia and more mild levels of iron deficiency impair immune function and was associated with reduced work output among women cotton mill workers. The effect of iron supplementation (ferrous fumarate) on the iron
status and physical work capacity was studied in anaemic middle class women. It was observed that 60 per cent of the subjects were suffering from mild to moderate iron deficiency anaemia (Busta, 2005).

Butler et al (2004) reported that soy foods may reduce the development of chronic respiratory symptoms, especially productive cough. It has been suggested that flavonoids from soy foods act as an anti-inflammatory agent in the lung, and can protect against tobacco carcinogens for smokers. Supplementation coupled with short term yoga and exercise increased the lung volume and improvement seen in forced vital capacity (Matirosyan, 2007).

Although the textile industry in India has a large population for many years health hazard of the women working in these ginning and spinning factories has been overlooked. Moreover all the studies conducted so far, were confined to selected area and there is no recent study which portrays clearly the health and nutritional status of ginning and spinning workers. Working women have multiple roles to play as a wife, a mother and an employee. Being subject to dual demands of home and workplace, they are liable to have crises of adjustment which may cause stress and strain (Kailer, 1995). Considering these information, an attempt has been made in this study to assess health status of women working in textile industries.

**General Objective**

The general objective of the present investigation is to seek information about work pattern, nutritional and health status of textile women workers and a special emphasis is made on correcting their micronutrient deficiency through intervention programme.
Specific Objectives

- To study the socio economic background and work pattern of women working in ginning and spinning units of textile industries.

- To assess their nutritional and health status.

- To formulate and evaluate micronutrient fortified soy biscuits.

- To test the efficacy of micronutrient fortified soy biscuit supplementation on haematological indices and respiratory conditions of selected ginning women workers.

- To provide awareness on nutritional importance among cotton textile ginning women workers.