INTRODUCTION

Non communicable diseases (NCDs) are chronic degenerative diseases characterized by long duration, slow progression, multiple risk factors, non contiguous origin, functional impairment and incurability. NCDs such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes, are by far the leading cause of mortality in the world, representing 63% of all deaths. Out of the 36 million people who died from chronic disease in 2008, nine million were under 60 and ninety per cent of these premature deaths occurred in low- and middle-income countries (WHO factsheet on Chronic Diseases 2012). It has aptly been termed as the "Neglected Epidemic" by the World Health Organization.

Low and middle income countries such as India are facing a tremendous burden of NCDs which is expected to escalate rapidly in the coming decade. Contrary to popular belief where developing countries are believed to be straining under the pressure of rampant under nutrition, data clearly shows that in present time, over nutrition and its related problems have overtaken under nutrition. Developing countries such as India are now facing an economically draining dual burden of malnutrition. According to WHO data, NCDs were responsible for 53% of all deaths in India in 2011 (WHO NCD Country profiles 2011). Increasing burden of NCDs is a threat to a nation's economic prosperity as well as an individual's well-being. In addition to being a health problem, it is also a developmental challenge. It is disturbing to see that a large proportion (9 million) of the NCD burden is borne by people under the age of 60 years i.e. productive age population.

Research shows that India suffers a greater loss in economically productive life due to cardiovascular (CVD) deaths compared to other countries: by 2030, this will be equivalent to 17.9 million years lost among 35–64 year-olds (World Diabetes Foundation 2009). At the household level, unhealthy behaviours, poor physical status, and the high cost of NCD-related health care, lead to loss of household income. People often become trapped in a dangerous cycle where poverty and NCDs continually reinforce one another. While measuring the economic impacts of NCDs remains a relatively complex and under-developed discipline, they invariably affect low- and middle-income countries and households more severely because they have the least financial cushion to withstand the economic consequences of NCDs. The World Health Report 2010 states that each year, 100 million people are pushed into poverty because they have to pay directly for health services; in some countries, this may represent 5% of the population forced into poverty each year. Financial hardship is not restricted to low- and middle-income

countries: almost 4 million people in six countries (Greece, Hungary, Mexico, Poland, Portugal and the Republic of Korea) reported forms of financial hardship caused by paying for health care. The report indicates that direct out-of pocket payments still represent more than 50% of total health expenditures in a large number of low & middle income countries.

In low-resource settings, treatment for cardiovascular disease, cancer, diabetes or chronic lung disease can quickly drain household resources, driving families into impoverishment. NCDs exacerbate social inequity because most payments for health care in low & middle income countries are private and out-of-pocket; such costs weigh more heavily on those least able to afford them, increasing the risk of impoverishment. If those who become sick or die are the main income earners, NCDs can force a drastic cut in spending on food and education, the liquidation of family assets and a loss of care and investment in children. Where males are the primary income earners, widowhood or the burden of caring for a permanently disabled partner are routes to poverty. The high rate of disability due to NCDs is a particular burden on women and children. This may result in children losing opportunities for schooling, women losing the main sustenance for their families, and families losing their stability.

In some countries, the lowest income households have the highest levels of NCD risk factors, with negative consequences on household income. Data from Nepal indicate that the poor spent 10% of their income on cigarettes (Karki et al 2003). In India, the risk of distress borrowing and distress selling of assets was notably higher for hospitalized patients who are smokers (Bonu et al 2005).

The NCD epidemic is making its presence felt very prominently among the productive age group. Various studies carried out on Indian industrial population show high prevalence of NCD as well as its risk factors in productive age (18-69 years) population (Prabhakaran et al 2005, Reddy et al 2006, Kaur et al 2007). Earlier studies carried out in the department of Foods and Nutrition, The Maharaja Sayajirao University of Baroda have also shown high prevalence of NCDs & their risk factors in industrial productive workforce of Baroda city (Mehan et al 2007, Mehan et al 2008 and Mehan et al 2011). Premature death is a major consideration when evaluating the impact of NCDs on a given population, with approximately 44% of all NCD deaths occurring before the age of 70. In low & middle income countries, a higher proportion (48%) of all NCD deaths are estimated to occur in people under the age of 70, compared with high-income countries (26%). The difference is even more marked for NCD deaths in younger age ranges. In low & middle-income countries, 29% of NCD deaths occur among people under the age of 60, compared to 13% in high income countries (WHO Global Health Observatory on Premature NCD Deaths 2013). The NCD risk factor in STEPS surveys in South East Asian region (2003-2005) as

reported by the WHO Regional office for SEAR region show the prevalence of risk factors among 25-64 year olds to be as follows: Current smokers 16-32%, current consumers of alcohol 3-41%, inadequate fruit and vegetable intake 81-99%, physical inactivity 4-24%, overweight & obesity 9-44%, hypertension 8-42%, high fasting blood glucose 4-9%, raised cholesterol 13-54% (World Diabetes Foundation 2009). In absence of more recent data, the figures presented above are considered for representation of burden of disease in countries.

This is the direct result of the various changes that have taken place in the workplace in the last decade. Urbanization has brought along with it several changes in the workplace such as replacement of manual labour by desk jobs, increased workload, increased stress levels, more money power & availability of convenience foods which are rich in calories and poor in nutrients are the root cause of NCD burden among the productive age population. It is well documented in literature that urban population has a higher prevalence of NCD risk factors as well as their actual prevalence compared to the rural populace (Chaddha et al 1997, Gopalan 1997, Ramachandran 1998, Shetty 2002, Lubree et al 2002).

Today, growing number of young people are spending long working hours at their workplace, in a competitive environment. They are, hence at an increased risk of falling into unhealthy lifestyle habits such as increased consumption of junk food coupled with sedentary lifestyle resulting in overweight, obesity, hypertension, diabetes & heart disease. A study conducted by Allender et al (2009) on Indian population established a relationship between urbanicity and NCD risk factors. The study results indicate that among men, urbanicity was positively associated with smoking, high body mass index (BMI), high blood pressure and low physical activity; among women, urbanicity was associated with low physical activity and high BMI.

NCDs are largely preventable by means of effective interventions that tackle shared risk factors, namely tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. If the major risk factors for chronic disease were eliminated, around three-quarters of heart disease, stroke and type 2 diabetes would be prevented; and 40% of cancer would be prevented (WHO Ten facts on NCDs 2012). It is thus imperative to intervene and break this vicious cycle in order to control the growing NCD epidemic among productive age individuals.

The WHO Global Plan of Action on Worker's Health (2007) also stipulates the need to address all aspects of worker's health including – promotion of health at work and improved response from health systems to workers' health. WHO has suggested "settings approach" as an effective strategy for conducting health promotion programmes. A multi sectorial, settings approach has also been advocated in the Jakarta Declaration of 1997 as well as the Ottawa Charter of 1986 (WHO 1997, WHO 1986). Out of the different settings suggested, 'workplace' is one of the most

important settings affecting the physical, mental, economic and social well-being of the workers, and thereby the health of their families, community and society. It also offers an ideal setting and the infrastructure to support national health promotion programmes for large audiences.

It is well-documented in literature that workplace wellness programmes have been successful in bringing about positive health changes in employees in addition to being cost effective for the employers. The Chairman of Johnson & Johnson, James Burke established 2 health related goals in the late 1970s: encourage employees to become the healthiest in the world and reduce the cost of health care for the firm. The company started a wide-range of employee health promotion programmes including nutrition education, onsite fitness and other services. Between 1995 and 2010 the percentage of employees who smoked declined by more than two-thirds and those with high blood pressure or who were physically inactive declined by more than half (Berry et al 2010).

A worksite-based study evaluated clinical efficacy and cost-effectiveness of a 6-month health intervention using cardiac rehabilitation and exercise training. Employees (n=308) and spouses (n=31) were randomized to receive the intervention (n=185) v/s usual care (n=154). Significant improvements were demonstrated in body fat (-9%, p = 0.001), high-density lipoprotein cholesterol (+13%, p = 0.0001), diastolic blood pressure (-2%, p = 0.01), health habits (-60%, p = 0.0001), and total health risk (-25%, p = 0.0001) in addition to other mental health parameters. Of employees categorized as high risk at baseline, 57% were converted to low-risk status. Average employee annual claim costs decreased 48% (p = 0.002) for the 12 months after the intervention, whereas control employees' costs remained unchanged (-16%, p = NS), thus creating a sixfold return on investment. In conclusion, worksite health intervention decreased total health risk and markedly decreased medical claim costs within 12 months (Milani and Lavie 2009).

Similar results were reported by a 2010 meta-analysis of 15 workplace health promotion studies where researchers found that on average $3.37 in health care costs was saved for every dollar spent over 3 years (Baicker et al 2010). That finding echoes earlier analyses of peer-reviewed studies (Aldana 2001, Chapman 2005, Pelletier 2005).

Keeping this in mind, the present study was planned with a central aim of designing and implementing a health promotion programme in a selected industry located in an urban Indian city and thereafter, evaluating the impact of the same on the knowledge, attitude and practices as well as nutritional profile of the employees.

Broad Objective

To evaluate the impact of a nutrition health promotion programme in an industry located in an urban Indian city on the knowledge, attitude and practices as well as nutritional and health profile of employees.

Specific Objectives

- To assess the existing nutrition and health related policies, canteen facility and recreational activities in industry using pretested, standardized and adapted Worksite Wellness Index (Texas State Department of Health Services 2004).
- To assess the prevalence of NCDs and their risk factors among the employees by WHO STEPS approach (Bonita et al 2001) using pretested, standardized and adapted WHO STEPS questionnaire (WHO STEPWISE Approach 2008).
- To evaluate knowledge, attitude and practices of employees regarding NCDs and principles of healthy lifestyle using a pretested, standardized questionnaire.
- To develop and implement a nutrition health promotion programme in the industry.
- To identify the bottlenecks and facilitating factors in implementing a nutrition health promotion programme in a workplace setting.
- To evaluate the effectiveness of the nutrition health promotion programme on knowledge, attitude and practices as well as nutrition and health profile of employees after an intervention period of 6 months.