EFFECT OF HEALTH AND HEALTH BEHAVIOURS ON ABSENTEEISM AMONG LABOUR FORCE OF SRI LANKA

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จุฬาลงกรณ์มหาวิทยาลัย
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บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
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ผลของสุขภาพและพฤติกรรมทางสุขภาพต่อการขาดงานของแรงงานในประเทศศรีลังกา

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จุฬาลงกรณ์มหาวิทยาลัย
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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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Field of Study	Health Economics and Health Care Management
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วีระวัฒน์ กันคานามาลาจ ชามินดา ประภาส วีระวัฒน์ : ผลของสุขภาพและพฤติกรรมทางสุขภาพต่อการขาดงานของแรงงานในประเทศศรีลังกา (EFFECT OF HEALTH AND HEALTH BEHAVIOURS ON ABSENTEEISM AMONG LABOUR FORCE OF SRI LANKA) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ธัชนันท์ โกมลไพศาล, 82 หน้า.

ผลผลิตทางเศรษฐกิจของประเทศถูกควบคุมโดยปัจจัยหลายประการ โดยมีแรงงานเป็นองค์ประกอบที่สำคัญ ปัญหาการขาดงานชองแรงงานย่อมขัดขวางเศรษฐกิจให้ไปไม่ถึงถึงศักยภาพสูงสุด

การศึกษานี้ใช้ข้อมูจากสำรวจแรงงานซึ่งจัดทำขึ้นโดยกรมสำมะโนประชากรและสถิติของประเทศศรีลังกาในปี พ.ศ. 2557 การสำรวจดำเนินการครอบคลุมทั้งประเทศและตลอดทั้งปีโดยมีกลุ่มตัวอย่าง 25,000 ครัวเรือน สุขภาพของแรงงานวัดโดยใช้สถานะทางสุขภาพที่ประเมินด้วยตนเอง ในขณะที่พฤติกรรมสุขภาพมุ่งเน้นที่พฤติกรรมการสูบบุหรี่และการบริโภคเครื่องดื่มแอลกอฮอล์ของแรงงาน

ผลการศึกษาโดยใช้แบบจำลองถดถอยโลจิสติกแสดงให้เห็นว่าลักษณะทางสังคม เช่น เพศ สถานภาพสมรส ความเจ็บป่วยแบบเรื้อรังและความเจ็บป่วยแบบเฉียบพลันเพิ่มความน่าจะเป็นที่แรงงานจะขาดงาน ในขณะที่ พฤติกรรมการสูบบุหรี่เพิ่มความน่าจะเป็นที่แรงงานจะขาดงาน การบริโภคเครื่องดื่มแอลกอฮอล์ก็มีผลเช่นเดียวกัน แรงงานที่ประเมินสถานะสุขภาพของตนว่าดีมีโอกาสที่จะขาดงานน้อยกว่า

ความเกี่ยวข้องระหว่างการขาดงานที่เพิ่มสูงขึ้นกับความเจ็บป่วย พฤติกรรมการการสูบบุหรี่และการบริโภคเครื่องดื่มแอลกอฮอล์บ่งชี้ความจำเป็นในเรื่องการให้บริการส่งเสริมสุขภาพและการป้องกันโรค

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Economic output of a country is moderated by many factors and out of which labour is an important element. Absenteeism among the labour force is impeding economy from realising full potential.

This study was conducted to find the effect of health and health behaviour on absenteeism of the labour force of Sri Lanka.

Study utilized secondary data generated from the annual labour force survey conducted by Department of Census and Statistics Sri Lanka in 2014 The survey was conducted to cover the whole country and throughout the year with a sample of 25,000 households. Health was measured from self-rated health status while health behaviour focused on smoking behaviour and alcohol consumption.

The results from logistic regressions indicated that sociodemographic characteristics such as gender, marital status and chronic illnesses and acute illnesses were all found to increase the likelihood of being absent. Smoking was found to increase likelihood of absence while alcohol consumption had similar effect. Good self-rated health status had a likelihood of decreasing absenteeism.

Higher absenteeism associated with illnesses, smoking and alcohol consumption highlights the need of preventive and promotion health services.

Field of Study: Health Economics and Health Care Management Student's Signature .....
Advisor's Signature .....

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1. Introduction

Economic output of a country is dependent on many factors out of which the labour force is one of the key element influencing the whole process. Contribution made by the labour force is moderated by many attributes and absenteeism among the labour force is one such attribute effecting the economic output. Absenteeism at workplace is in turn influenced by many factors and exploring the effect of such factors will help to gain valuable insights to minimize economic loses brought about by absenteeism.

1.1 Sri Lanka

Sri Lanka is a small island nation in the Indian Ocean belonging to the South Asian region with close proximity to the southernmost tip of India. The country has a long history and heritage extending more than 2,500 years. Due to its strategic location in the Indian Ocean, Sri Lanka was under colonial masters for an extended period of time. First to colonize was the Portuguese in the year 1505 which later was under Dutch rule as Portuguese were defeated by Dutch. Finally, the country was under the British rule as part of the empire in year 1815. A period extending over another century was under the British rule from which independence was gained in 1948. This extended period under foreign rule had made a big impact for the country and legacies of colonial masters are still visible (Gunawardena, 2005).

The land area of the country totalling to 65,610 sq. Km is occupied by 20.9 million inhabitants with a relatively higher population density 334 persons per sq. Km (Ministry of Health, Nutrition and Indigenous Medicine - Sri Lanka, 2017).

Administratively the country is divided into 9 provinces and each province is further divided to districts. The whole country has 25 districts where few districts collectively make a province. Additionally, the country could be broadly divided into 3 sectors based on different socio-economic and other characteristics as urban, rural and estate. Economy wise, Sri Lanka is classified as a Lower Middle Income Country (LMIC) with Gross Domestic Product for 2015 totalling to USD 82.3 billion and having Gross Domestic Product (GDP) per capita of United States Dollars (USD) 3,924 (Central Bank

of Sri Lanka, 2016). The economy is an agriculture reliant with a significant rural based production. Presently the focus is shifting from rural based agriculture to urban based services and industries. The main exports of the country have been agriculture based Tea, Rubber and Coconut together with exports related to garments and textiles (Central Bank of Sri Lanka, 2017). Additionally, foreign remittances by workers employed overseas has also been source of foreign exchange earnings for the country. Governance system for the country is based on a system with an executive president with multi-party democracy. Sri Lanka has a long history for democracy and had adopted the policy of Universal Franchise in the year 1931 just two years after Britain had adopted whilst being colony under Britain (Gunawardena, 2005). The change was part of reforms made by the lord Donoughmore commission and for the first time all people above age 21 years were given voting rights in the 1931 election.

Political power is mostly concentrated around the centre. However, a limited degree of devolution of power is visible to provincial level where some subjects are devolved to a variable degree.

Education and Health are two distinct areas where the country has a slightly different approach than the neighbouring countries of the region. Post-independence successive governments had continually invested in free education and free health over a sustained period of time. Education up to the bachelor degree level and whole spectrum of healthcare services are provided through public service providers.

Free education is provided through an extensive network of public schools and state universities. There is no involvement of user fees and the whole financial burden is serviced through general taxation. However, there are limited number of private schools engaged in the provision of education in local curriculum as well as international curricula funded by user fees. Private universities are present in very small scale compared to state run counterparts, offering education mostly with foreign collaborations.

Health system of Sri Lanka provides Universal Coverage through public provider system which is accessible for all citizens while maintaining zero user fees at the point of service delivery. Thus the public sector service provision is funded through tax revenue and covers 95% of inpatient services, 50% of outpatient services and almost exclusive

preventive services. Private sector services are limited to about 50% of outpatient care and about 5% of inpatient care. According to the National Health Account 2013, the country spends about 3.24% of GDP on health which accounts for about USD 105.09 as per capita health expenditure where public sector spends contributes about USD 61.82 and other sources about USD 43.27 (Ministry of Health, Nutrition and Indigenous Medicine - Sri Lanka, 2016).

The citizens of the country have been privileged to experience good health outcomes which sets them apart from other countries of the region. According to the latest statistics published in 2017 by the Ministry of Health in Sri Lanka the average life expectancy at birth for males are 72 years and for females are 78.6 years respectively, Infant Mortality Rate is 8.2 deaths per 1,000 live births and the Maternal Mortality Rate is 26.8 per 100,000 live births. (Ministry of Health, Nutrition and Indigenous Medicine - Sri Lanka, 2017).

1.2 Labour force Sri Lanka

The labour force of the country had benefitted from the policies of free education and free health for a long period thus the country has made considerable investment in the labour force. Which had placed in an advantageous position among the people in the region.

However, an unfortunate prolonged civil war had engulfed the country which had sustained for about three decades. During the civil war, many lives were lost and out of which majority were in the economically productive age group. Apart from the direct loss assets, large numbers were deployed for security forces which had made the country to commit substantial proportion of youth away from economic production. Now eight years since the end of the war, the economy is reviving.

According to the survey of 2015, the working age population of the country identified as people with age above 15 years of the country is 15,281,946 people and out of which the economically active population (Labour Force) is 8,804,548 (Department of

Census and Statistics Sri Lanka, 2016). Analysing the labour force distribution from 2011 to 2015 by category of industry, it is observed a trend of moving out of agriculture which has experienced a decline from 33.1% to 28.7%, an increase in the services sector increasing from 43% to 45.6% and increase of industrial sector from 24% to 25.8% (Central Bank of Sri Lanka, 2016). For the corresponding period unemployment rate has increased marginally from 4.2% to 4.7% (Department of Census and Statistics Sri Lanka, 2016).

Economically Active Population (Labour Force) comprising about 8.8 million people is distributed as 65.1% of males and 34.9% females. (Refer Table 01)

Table 1: Distribution of economically active population

Gender	**Economically Active (%)**	**Economically Inactive(%)**
Male	5,728,165	1,948,493
	(65.1)	(25.2)
Female	3,076,165	5,778,727
	(34.9)	(74.8)
Total	**8,804,548**	**7,727,220**
	(100)	**(100)**

(source: Labour Force Survey Annual Report 2014, Department of Census and Statistics, Sri Lanka)

1.3 Formal and Informal sector

Sri Lanka economy processes a significant informal sector. According to the estimates of the Department of Census and Statistics of Sri Lanka, about 59.5% employees are in the informal sector while the remainder constituting to about 40.5% are employed in the formal sector (Department of Census and Statistics Sri Lanka, 2015).

The Department of Census and Statistics of Sri Lanka in 2006 defined the criteria for formal and informal sector. In which formal sector was taken as all government employment and the private sector when they are registered under Employees

Provident Fund or Inland revenue department or maintaining formal accounts or regular employees to be greater than or equal to 10. Unlike the formal sector, the informal sector does not have any social security system and are associated with poor work conditions (Department of Census and Statistics Sri Lanka, 2015).

1.4 Health of the people

As a result of continued political commitment for free health, health professionals and policy makers were able incrementally improve the health system. Therefore, work done by health workforce over a long period of time had enable people to benefit in terms of good health outcomes.

Currently the country is experiencing an epidemiological transition which is the shift of disease patterns from Communicable Diseases to Non Communicable Diseases. However, the burden has not entirely shifted and as of now the country is faced with double burden of diseases where both types of diseases are raising concerns. Aging population and other factors like behavioural risk factors have significantly increased the burden of Non Communicable Diseases (NCD). However, few Communicable Diseases like Tuberculosis and Dengue are still posing significant threats to the health of the people.

Behavioural risk factors are increasingly assuming importance in the aetiology of NCD where two such behaviours like use of tobacco and harmful use of alcohol have significant influence. Sri Lanka is not different from most other countries as smoking and alcohol consumption has become a part of the social norm and the health authorities are making an effort to distance population from such engagement. A survey performed by Health Ministry with partnering with World Health Organization (WHO) in 2015 has indicated that 45.7% of men and 5.3% of women currently use some form of tobacco (including smokeless tobacco) whereas 34.8% of men are current alcohol users while 96.5% of women were lifetime abstainers (Ministry of Health, Nutrition and Indigenous Medicine - Sri Lanka, 2016).

Thus there is an interplay of many factors influencing the health status of the population.

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1.5 Economic impact of absenteeism

Absenteeism is effecting economies in terms of lost output and increased cost of production. At national level, lost output is very difficult to measure and is usually done by estimates. Increased cost of production is effecting at organizational level and has many facets.

Studies done across European Union has made estimates the effect of Absenteeism on Gross Domestic Product (GDP). Average estimation done across European Union member countries concludes that absence from work translates to a loss of about 2.5% of GDP (European Foundation for the Improvement of Living and Working Conditions, 2010).

Similar estimates done in Australia earlier had concluded that cost of Absenteeism with conservative estimate made by the National Institute of Labour Studies of Australia was about USD 7 billion for the year 1990 translating to about 2% of GDP (Wooden, 1992).

Absenteeism translates to increased cost of production of goods and services. Increased costs would have straight forward direct costs as well as hidden and indirect costs. The direct costs would add compensation paid to absent employees, resources spent on treatment for sickness etc. However, the hidden and indirect costs are not readily identifiable and measurable. These include more evident costs like the other employees having to work harder, deferring work, cutting down on services, temporary hiring, maintaining extra workforce for cover-up work etc. Additionally, it is pointed that inter-dependent work and highly skilled worker dependent work are most vulnerable for employee absenteeism (Australian Faculty of Occupational Medicine, 1999).

Australian Faculty of Occupational Medicine identifies a list of additional consequences of absenteeism of the work force.

- increased costs
- lower morale
- increased workloads
- frustrated managers and supervisors
- loss of productivity
- non achievement of objectives
- reduced provision of services
- decreased product quality
- increased training costs and loss of key skills and personnel
- increased supervisory and administrative costs
- adverse public perception and confidence
- adverse effects on consumers (Australian Faculty of Occupational Medicine, 1999).

When the costs faced at organization level due to Absenteeism are summed up, it translates into a significant value at national level. However, the calculations and estimations are done for more direct costs as hidden costs are quite difficult to measure.

However, comparisons across countries are not always possible as there are significant variations among definitions and due to different levels of reliability of data.

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1.6 Significance of the research

Sri Lanka belongs to Lower Middle Income Country (LMIC) category and is aspiring to improve economic condition of the country. Unlike many countries, high revenue generating resources like petroleum, gold, diamond etc. are not found within the country territory. Therefore, resource constraint is quite significant. Thus economic impetus has to come from another source.

Human Resource remains as a viable option for the provision of economic thrust. As the country is currently experiencing ideal demographic structure with low dependent ratio or the demographic dividend, it remains as a golden opportunity to propel the economy forward. Considering the fact that a good part of the window was spent on fighting the 30-year civil war which had consumed significant amount of lives and other resources and had ended in 2009, the remaining period of the window is even more crucial.

The biggest assistance in developing human resource had been the consistent policies of successive governments in the provision of free health and free education enabling the country to receive a relatively healthier and educated labour force. Therefore, current environment has become more conducive for development.

However, optimizing the available human resources is a challenge at organizational level as well as country level. One key issue impeding output is the absenteeism among the labour force. Each day losses are incurred in terms of output, increased costs, delays etc. due to absenteeism.

Many countries have given due emphasis to minimize such losses by studying the phenomenon and optimizing associated factors. However, in Sri Lanka no such studies have explored into absenteeism among the labour force.

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1.7 Research Question

What is the effect of Health Status on Absenteeism among the Labour force in Sri Lanka?

1.8 General Objective

To estimate the effect of Health and Health Behaviour on Absenteeism among the labour force of Sri Lanka

1.9 Specific Objectives

1. To estimate the effect of socio demographic factors on Absenteeism among the labour force of Sri Lanka.
2. To estimate the effect of Health Status on Absenteeism among the labour force of Sri Lanka.
3. To estimate the effect of Health Behaviour on Absenteeism among the labour force of Sri Lanka.

1.10 Scope

The study is designed to explore absenteeism among the labour force of Sri Lanka based on the secondary data generated from the Labour Force Survey of 2014 done by Department of Census and Statistics, Sri Lanka.

The scope is limited to the situation of year 2014 which is the year the survey was performed. The respondents were limited to individuals who are employed and between the age of 15 years to 59 years.

The questionnaire was based on primarily on employment details, economic variables, socio-demographic data and limited data on health related variables.

The survey is a nationally representative survey which had covered the entire country as a household survey and therefore the findings are generalizable to the whole country.

2. Literature Review

2.1 Introduction

Absenteeism is a phenomenon affecting all economies around the world impeding from realizing full potential. The magnitude of the effect may vary across countries. Variety of factors are influencing Absenteeism. Many of early studies were focused on Job satisfaction and related factors. Continuous scientific explorations have expanded the understanding of the phenomenon.

In early twentieth century, absenteeism was widespread in the United States which led to many studies. One of the earliest definition of Absenteeism proposed by Eleanor Kennedy, which depicted absenteeism as "*Failure of workers to report on the job when they are scheduled to work*" (Kennedy, 1943). A more pragmatic approach to the definition was proposed by William Noland in which he suggested as "*Absence of worker during a full shift that he is scheduled to work*" (Noland, 1945).

The definition was further evolved, an improvement was made by prof. Gibson who defined as "*Inability, and Inappropriateness, or unwillingness to work*" (Gibson, 1966).

2.2 Measuring Absenteeism

To manage absenteeism, measuring was essential to which is a challenge at national level as compared to organizational level. Self-employment and large informal sector further complicates measurements. Furthermore, lack of standardized definition for Absenteeism, makes it quite difficult for comparison across different studies, different states and different countries.

The in Absenteeism Rate varies from country to country. In a study done among member countries of European Union (EU), workers in Greece reported with 4.8 the lowest number of paid sick leave days followed by the Netherlands with 5.5 days while workers in Slovakia reported with 27.6 days the highest number of paid sick leave days among the EU member states (European Foundation for the Improvement of Living and Working Conditions, 2010).

However, in many countries absenteeism rates remain as an area with little exploration and no monitoring.

2.3 Health

Health of people of labour force is an important aspect which could influence absenteeism of the labour force. Historically, health was assumed to be a state free of diseases and the definition has evolved over time. World Health Organization by its constitution adopted in 1948 defines health as "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*". However, the definition has its own disadvantages that being too broad and vague measuring health is challenging.

The definition was subjected to much criticism, especially the word "complete" as advances in medical field increasingly discovered many imperfect states and the fact that many diseases are increasingly seen as a spectrum have been in the forefront. To decrease such ambiguity of the definition, new emphasis is laid on the three domains of health which are Physical, Mental and Social (Huber, Knottnerus, Green, Horst, & Jadad, 2011).

Measuring health status has been complicated over the years. Initially it was measured from the mortality rate of the population. Later on, indexes were used combining measures like mortality, morbidity, incidence etc. which later on progressed to life expectancy.

As the boundaries of the definition expanded into wellness, wellbeing, quality of life etc., many diverse tools were utilized to measure different aspects. Therefore it is emphasized to utilize appropriate tool for measuring for the required task (Garcia & McCarthy, 1994).

Sickness Absenteeism is another aspect of work place absenteeism where absenteeism is attributed for illness. However, most scholars have explored that even for Sickness Absenteeism, the underlying causes are more than sickness itself.

One of the early studies had yielded in a model suggesting workplace attendance is directly influenced by two principle factors. The suggested factors are

1. Motivation for attendance
2. Ability to come for work (Steers & Rhodes, 1978).

This model had served as the basis for many subsequent research and the model had undergone many refinements over time.

Effect of many different factors on absenteeism, was studied by Brooke Jr & Price and had come out with a causal model. The model utilizes five endogenous variables namely Job Satisfaction, Job Involvement, Commitment, Health Status and Alcohol involvement which is theorized to be intervening the effects of ten more Exogenous Variables (Brooke Jr & Price, 1989). The exogenous variables described and some endogenous variables also exert positive or negative influence on the endogenous variables and in turn they exert a positive or negative influence over Absenteeism. The model had focused mainly to organizational level factors in describing absenteeism where only health status and alcohol involvement being at outside organizational level. the Endogenous and Exogenous factors described are summarized in table 02.

Table 2: Endogenous and Exogenous factors of model of Brooke Jr & Price

Exogenous Factors	Endogenous Factors
1. Routinization	1. Job Satisfaction
2. Centralization	2. Job involvement
3. Pay	3. Commitment
4. Distributive Justice	4. Health Status
5. Role Ambiguity	5. Alcohol Involvement
6. Role Conflict	
7. Role Overload	
8. Work Involvement	
9. Organizational Permissiveness	
10. Kinship Responsibility	

(Source: Brooke Jr, P. P., & Price, J. L. (1989). The determinants of employee absenteeism: An emperical test of a causal model. *Journal of Occupational Psychology*, 1-19.)

2.4 Stress as cause for Absenteeism

Subsequent studies had focused more on stress on employees to be a primary reason for absenteeism. Many models were suggested in which stress was considered as a primary cause.

The effect of Organizational and Extra-organizational factors on absenteeism was studied by Hendrix et al. in the early nineties. The study was based on a model that Organizational and extra-organizational factors which are suggested to affect exogenously through Job Stress and Life Stress which act as mediators on the two exogenous variables respectively (Hendrix, Spencer, & Gibson, 1994).

Unlike the Brooke Jr & Price model, only two mediators were postulated which both being stress but caused by different settings.

Subsequent studies by Whitaker, focused mainly to explain absenteeism due to sickness. However, in doing so he described with extensive variables not confining to health. The work summarized possible factors into three levels and they are Macro level, Organizational level and Individual level (Whitaker, 2001). Unlike many other models, the proposed model does not identify intermediate factors interacting. List of factors proposed by Whitaker are as follows (refer table 03).

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Table 3: Factors effecting Sickness Absenteeism

Macro Level	Organizational Level	Individual Level
Climate	Nature of industry	Age
Epidemics	Working Conditions	Sex
Provision of Healthcare Services	Job Demands	Occupational status
Social Insurance Systems	Size of the enterprise	Job Satisfaction
Sickness certification practice	Characteristics of the workforce	Length of service
Taxation	Workforce availability	Personality
Pensionable age	Industrial Relations	Life Crisis
Social attitudes	Supervisory Quality	Family Responsibilities
Economic climate	Personnel policies	Social support
Availability of alternate employment	Labour turnover	Leisure activities
Unemployment	Provision of Occupational Health Services	Alcohol Intake
		Health Status of the individual

(Source: Whitaker, S. (2001). The Management of Sickness Absenteeism. *Occupational and Environmental Medicine*, 420-424.)

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2.5 Influence of socio-demographic characteristics

A study performed on federal government employees of the United States to explore the difference between females and males on Absenteeism. The study had proposed a model where exogenous factors mediate through two kinds of stress which are Job Stress and Life Stress. The results of the study point out that females are subjected to higher level of job stress compared to males and also a higher rate of absenteeism. The data had suggested that gender moderates the effects of stress. (Hendrix, Spencer, & Gibson, 1994)

In cross sectional study done in Central Sweden using postal questionnaire on a random sample of economically active people in age of 18 years to 84 years (N= 19,826) on self-rated health and absenteeism. The results found to have found to have a significant higher rate of sickness absence among women across all age groups who had recorded 90 days or more during the past one year (Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008; Brooke Jr & Price, 1989).

A study performed using nationally representative data from Germany of year 2009 had revealed significantly different rates of Absenteeism among males and females in health and postal sectors which had calculated to be 17.3 as compared to 15.6 paid sick leave days of male workers and 14.6 compared to 12.2 days per year respectively (Scheil-Adlung & Sander, 2010).

However, according to assessment of absence from workplace among 27 European Union member states in a comparison study done across member countries had indicated that the differences in rate of Absenteeism among males and females are not very clear (European Foundation for the Improvement of Living and Working Conditions, 2010).

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A study on Absenteeism focussing on comparison across gender was performed in United Kingdom using UK Family Expenditure Survey of the year 1993. The study included 4,229 people out of which 2,154 were male and 2,075 were female. Study had used probit model regression and the results had indicated that a strong positive correlation of absenteeism and age. Further variables exploring sociodemographic had indicated a significant negative correlation with marital status where unmarried people was having a higher absenteeism rate which is largely attributed to male gender. The results had concluded that an unmarried male is likely to be absent two times more than a married male, however effect of marital status on females were not significant. In women with children under 2 years had shown to significantly increase absenteeism while having children in age group of 2 to 5 years significantly increased the likelihood of male absenteeism (Bridges & Mumford, 2001).

A meta-analysis done to explore the relationship of age with employee absenteeism had concluded that an inverse relationship between age and absenteeism. In the analysis, the relationship was established for both voluntary as well as involuntary absenteeism (Martocchio, 1989).

2.6 Health Status

Out of many ways of measuring health status, the method of using self-rated health status is one of the simplest method. The method simply asks the participants to rate their health typically on a five point Lickert scale. It is the most commonly employed method in sociological research for the last 60 years (Jylha, 2009).

The important consideration for studies is the predictive power self-rated health status. In this regard a prospective study was done in Sweden involving a representative sample over 6,700 participants (about 20% of resident population of the area) representing age between 19 to 63 years with the main objective of exploring the value of self-rated health assessment in epidemiological studies. The participants were required to complete a questionnaire in the year 1980. Self-rated health status was recorded in 5 point lickert scale with an extra option of "cannot judge". Mortality of the cohort was followed for 10 years and 10 months up to year 1990. The results of the study had concluded self-rated health status are valid health status indicators for people in middle aged category (Miilunpalo, Vuori, Oja, Pasanen, & Urponen, 1997).

A population based study with over 43,000 participants exploring self-reported health status and sickness absenteeism was done in Sweden based on two hypotheses that individuals with long-term sickness absence would rate low self-rated health and the other being that women are more likely to rate psychiatric diagnosis compared to men and the men would likely have a higher diagnosis of musculoskeletal diagnosis in their self-rated health. The results of the study had concluded that individuals with long term sickness absence had lower self-rated health than the individuals who had not

been absent. On the second hypothesis, no sex difference between both diagnoses were found. (Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008).

Another population based longitudinal study done on 8 cohorts of Sweden, to investigate association between Self-Reported Health with Sick Leave, disability pension, in patient care, mortality. The study population was followed up an average of 10.5 years with a total of 100,251 person years. The results indicated a strong negative correlation between health status and absenteeism indicating better health status accompanying lower absenteeism rates (Halford, et al., 2012).

2.7 Behavioural Risk Factors

Behavioural risk factors have a significant impact of health in adult population. World Health Organization estimates that in South Asian region 62% of deaths are related to Non communicable Diseases amounting for about 8.5 million deaths per year. Out of which 48% are believed to be below 70 years of age translating to a significant proportion of economically productive population. Four major Non Communicable Diseases are identified to be responsible while four important modifiable risk factors are identified to have important role in the aetiology of the diseases. The four risk factors are Tobacco use, unhealthy diet, insufficient physical inactivity and harmful use of alcohol (World Health Organization SEARO, 2017).

The effect of Alcohol and smoking behaviour and their relationship with absenteeism at work place has been the focus of many studies.

Australian report by Australian Faculty of Occupational Medicine suggests that alcohol and tobacco both increase Absenteeism at workplace (Australian Faculty of Occupational Medicine, 1999).

A study done in Taiwan to estimate the productivity losses and financial cost on the employer's perspective concludes that smoking significantly increases the rate of Sickness Absenteeism for males and females as compared to non-smokers. The study also estimated for Taiwan, the excess absenteeism costs about USD 184 million per year using human capital approach on the assumption that excess absenteeism to equate to wages for the period. Even these estimates did not capture all hidden costs

and costs associated with premature deaths of employees attributed for diseases associated with smoking (Tsai, Wen, Cheng, & Huang, 2005).

Studying various behavioural risk factors on absenteeism and healthcare costs in US setting in a diversified company with over 45,000 participants had identified that smoking, overweight, excess alcohol, high blood pressure as important risk behaviours in ranking order in terms of costs. Annual excess illness costs per person at risk was highest in smokers at USD 960, Overweight at USD 401 and excess alcohol at USD 389 (Bertera, 1991).

A prospective cohort study was performed in US setting with employees of an airline reservation company where one objective was "*to evaluate the impact of smoking status on productivity and absenteeism measures*." The study included three groups of participants of 100 each representing current smokers, former smokers and people had never smoked. The participants were followed up for a period of four months. The results indicated that current smokers had the highest absenteeism rate among the three groups. It was also observed that never smokers had the lowest rate of absenteeism while the former smokers had intermediate value (Halpern, Shikiar, Rentz, & Khan, 2001).

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In another study done on the labour force of United States, to estimate the cost of two Non Communicable Diseases and three risk factors (Diabetes, Hypertension, Obesity, Physical Inactivity and Smoking). The data was obtained from de-identified commercial health care claims database (N=127,143). Statistical analysis was based on a zero inflation Poisson regression model. From the model it was evident that current smoker controlled for other variables will miss 1.07 days per year than a non-smoker (at 95% confidence interval). The cost estimates were worked on the basis of human capital theory and estimated cost from smoking through excess absenteeism was about USD 3.6 billion for year 2015 to the country (Asay, Roy, Lang, Payne, & Howard, 2016).

A study was performed to estimate the economic cost of excessive alcohol consumption in U.S. for the year 2006. Out of many different costs estimated lost productivity of labour was estimated to be 72.2% of a total cost of US Dollars 223.5 billion. Productivity loss had included losses associated with premature mortality, decreased productivity, absenteeism and victims of alcohol related crime. Working of costs were based on Human Capital theory and calculated on estimated earnings (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011).

2.8 Sri Lankan context

Situation in Sri Lanka, with regard to disease conditions and behavioural risk factors have been studied under the guidance of Ministry of Health and the Department of Census and Statistics in various studies. However, Absenteeism among the labour force and its relations to disease conditions remains as a largely unexplored area. As most studies and relevant data are available to settings quite different from Sri Lanka, direct adoption of such results are not scientific Therefore, there is a well-defined gap to fill in existing knowledge by undertaking the study.

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2.9 Conceptual Framework

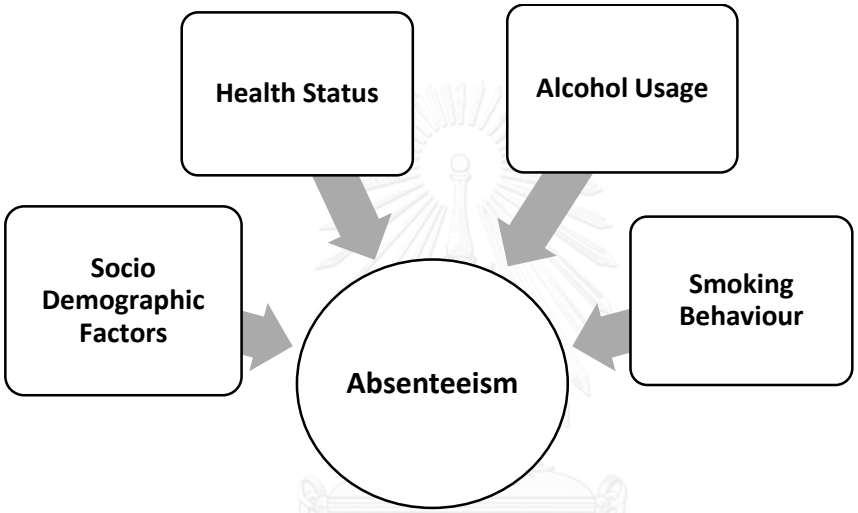
The proposed study is based on the work suggested by Whitaker. According to his work he had identified factors effecting at three different levels and for this study, factors effecting at individual level were focused. The framework focusses on socio-demographic factors, health status, smoking behaviour and alcohol consumption of individuals.

Health is measured by self-declared health status on Lickert scale.
Health behaviour is represented by four important dimensions as identified by World Health Organization and they are tobacco use, unhealthy diet, insufficient physical activity and harmful use of alcohol (World Health Organization SEARO, 2017). Out of

the four health behaviours, smoking behaviour and alcohol consumption is included in the study owing to limitations of availability of data.

Sociodemographic variables are included to control the effect exerted by them on health status and health behaviour.

Figure 1: Conceptual Framework



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3. Methodology

3.1 Research design

The study will be conducted using secondary data generated from the National Labour Force survey covering the entire country conducted in the year 2014 by the Department of Census and Statistics, Sri Lanka. In addition to the routine survey on labour force, an additional section on health related questions were added to the 2014 survey.

The survey was performed during 12 calendar months in the year 2014. As it was population based survey and was done by visiting the households of participants which involved multiple visits to the selected households.

The survey data was generated following a descriptive cross sectional study using an interviewer administered questionnaire.

3.2 Tool

The survey instrument used was an interviewer administered questionnaire. The questionnaire consisted of two parts. First, the standard labour force questionnaire used routinely to extract information about the labour force. The second part which consisted of a health module designed to enumerate health related data.

3.3 Inclusion and exclusion criteria

The survey was performed as a population based survey and the current study, inclusion and exclusion criteria were applied additionally to the criteria applied in the survey.

Age was considered an important criterion to apply for the data as the survey had captured all population above five years of age.

The formal definition of labour force of Sri Lanka which states people above 15 years of age (Department of Census and Statistics Sri Lanka, 2016). Applying the definition, the minimal age of participants was set at 15 years. However, the definition does not

cover an upper age limit. The official retirement age of public services is set at 55 years of age and beyond which extensions are given till 60 years which is the compulsory retirement age. However only under special circumstances extensions are given till 63 years. For the study, the official compulsory retirement age was considered and the upper age limit of participants were set at 60 years.

As the focus of the current study was on absenteeism of population engaged in economic activity, the second criterion was applied to ensure that participants are engaged in economic activity.

Inclusion and exclusion criteria applied for the study above the initial criteria of the survey are stated below.

3.3.1 Inclusion Criteria

1. Age above 15 years and less than 60 years
2. Engaged in economic activity as an employee or on own account

3.3.2 Exclusion Criteria

1. Age less than 15 years and more than 60 years
2. Not engaged in economic activities (unemployed/students etc)

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3.4 Sampling

Sampling was performed done using the work already performed for the 2011 National Census conducted by the Department of Census and Statistics of Sri Lanka.

3.4.1 Sample Frame

The survey was to cover the whole country and whole population was the sampling frame. The master sampling frame prepared for the last census (2011) was used. Two stage stratified sampling process was adopted. A sample of 25,000 housing units were selected.

3.4.2 Sample size

The sample size was worked on considering historical data. In 1990, a total of 8,000 housing units were enumerated where 2,000 representing each quarter. During the years 2004, an annual sample of 20,000 households were utilized to obtain a better distribution of the 25 districts. From 2011 onwards an annual sample of 25,000 households are used for the survey.

3.4.3 Sample Allocation

The survey employed 2,500 Primary Sampling Units (PSU). These PSU's are distributed among 25 districts which also covers urban, rural and estate sectors. The allocated sample for each district is equally distributed along 12 months.

From the PSU a secondary sampling unit (census block) was selected randomly. Each census block consisted of 10 households which upon selection was used in enumeration.

The allocation of sample on district and province wise is given in table 04.

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Table 4: District wise Sampling Unit distribution with district population

District	Province	Primary Sampling Units	Population as in 2012 Census
Colombo	Western	2,270	2,324,349
Gampaha		2,590	2,304,833
Kalutara		1,250	1,221,948
Kandy	Central	2,150	1,375,382
Mathale		570	484,531
Nuwara-Eliya		590	711,644
Galle	Southern	1,300	1,063,334
Matara		1,200	814,048
Hambanthota		1,000	599,903
Jaffna	Nothern	600	583,882
Mannar		360	99,570
Vavuniya		360	172,115
Mullaitivu		360	92,238
Kilinochchi		360	113,510
Batticaloa	Eastern	860	526,567
Ampara		1,010	649,402
Trincomalee		500	379,541
Kurunegala	North-Western	2,100	1,618,465
Puttalam		680	762,396
Anuradhapura	North-Central	670	860,575
Polonnaruwa		530	406,088
Badulla	Uva	890	815,405
Moneragala		460	451,058
Ratnapura	Sabaragamuwa	1,180	1,088,007
Kegalle		1,160	840,648
Total		25,000	20,359,439

(source: Sri Lanka Labour Force Survey: Annual Bulletin 2015)

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3.5 Data collection

Data collection was performed by the field staff of Department of Census and Statistics, Sri Lanka. A training for the data collectors were done prior to the data collection work. The process in each district was supervised by an official in the rank of Deputy Director/ Senior Statistician/ Statistician attached to the relevant District Secretariat. Direct supervision of field work was also performed on a regular basis.

Field work was performed during the entire 12 months of the year 2014. Primary sampling units were distributed in such a way to cover each district and four quarters of the year.

Enumeration was done at household level with multiple visits to ensure completeness (Department of Census and Statistics Sri Lanka, 2016).

3.6. Dependent Variable

The dependent variable is a dummy variable which indicates whether the participant had been absent for work or not. It was derived from the data available from the survey.

First a continuous variable was created to measure of the number of hours of work missed by the participant during the reference week expressed as a percentage out of number of hours expected to work during the week. The variable was created mathematically using the data generated from the questionnaire.

$$\textit{Percentage of hours missed} = \frac{\textit{hrs usually work for a week} - \textit{of hrs actually work during reference week}}{\textit{hrs usually work for a week}}$$

There were some participants working more than the usual amount in the reference week, rendering a negative value for the percentage of hours missed. The values less than zero was approximated as zero indicating that they have not missed any work during the reference period.

The dependent variable, “absence” was created as a dummy variable from the above variable (percentage of hours missed). The specification was set as when the variable percentage of hours missed is greater than 0, the dependent variable to assume as “1” and when the variable percentage of hours missed is zero, the dependent variable to assume “0”.

3.7 Explanatory Variables

Many different explanatory variables measuring different aspects were used for regression. The variables are listed in table 05.

3.7.1 Socio Demographics

1. Age

According to the definition of Labour Force of the Government of Sri Lanka, the members are considered to be people above 15 years. In the labour force, there is no upper age limit. For the current study, official retirement age of 60 years was applied and the participants were selected from 15 years upwards to below 60years.

The variable was operationalized as age in completed years where the variable has only integers from 15 to 59, thus resulting in a range of values from 15 to 59.

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2. Gender

The gender of the participant was enquired to whether male or female was and grouped to two mutually exclusive groups. Gender was denoted by dummy variable, “male” foe which was assigned “1” when the participant was male and “0” when participant was female.

3. Marital Status

In the survey questionnaire, marital status of the participants was grouped into five mutually exclusive categories. They are single (never married), Married (currently married), Widow, Divorced (currently divorced) and Separated (currently separated).

For the study, the five categories were grouped into two broader categories where the first being the married group and the other group being a collection of all people who are not currently married. In the dummy variable created, participants who are married was assigned “1” whereas the others assigned “0”.

4. Education level

The survey had extracted education level of participants in detail. Education of participants were split in to 18 levels ranging from no formal education to post graduate level. The study had re-categorized education level to 5 groups.

The first group being the participants without any formal education where the category represented people who never had any formal schooling. Such participants were assigned to dummy variable “edu1” for which was assigned ”1” and “0” was assigned for all other education levels.

The second category represented participants who had education up to primary level in school. Such participants had a maximum of six years of formal schooling. The participants with the described education level was denoted with dummy variable “edu2” for which was assigned “1” and “0” for participants having education level not satisfying the described specification for the category.

The third category represented participants who had formal education to secondary level representing up to the General Certificate in Education Ordinary Level(GCEOL) which represented 7 to 11 years of formal schooling. The participants with the stated education level was represented by dummy variable “edu3” for which “1” was assigned and for all other education levels “0” was assigned.

The fourth group represents participants who had attained education level up to advanced level or having studied up to General Certificate in Education Advanced Level (GCEAL) where participants had attended 12 to 13 years of formal schooling. They are grouped in dummy variable “edu4” where “1” is assigned and others are assigned “0”.

The fifth group represented participants who had some form of tertiary level education beyond formal schools. Such participants are represented from “edu5” where “1” is

assigned and for all other levels “0” is assigned. This group was chosen to represent the reference group.

3.7.2 Behavioural Risk Factors

1. Smoking

Smoking behaviour of the participants were enquired, as whether the participant is a current smoker. The answer was recorded as “yes” or “no” and for the study a dummy variable was created. Self-confirmation as a current smoker was recorded in the dummy variable “smoke” as “1” and being a non-smoker was recorded as “0”.

2. Alcohol consumption

The questionnaire had enquired whether the participant is a current user of alcohol. The answer was recorded in the “yes” or “no” format and for the study a dummy variable was created to explain the behaviour related to alcohol consumption. Self-confirmation of the concerned behaviour was recorded as “1” and non-use was recorded as “0” in the dummy variable.

3.7.3 Health Status

Health status of the participants were recorded as self-declared level and did not involve any objective measurements or verification. The respondents were asked to rate their health status in a five point Lickert scale having options as poor, normal, good, very good and excellent. The choices were recorded by the survey.

For the study, the five choices were grouped into two. The first group included the responders who had rated health status as “*excellent*”, “*very good*” or “*good*”. A dummy variable “goodh” was created and assigned “1” to such responders. The second group included participants who had recorded health status as “normal” or “poor” which was assigned “0”.

3.7.4 Presence of Chronic Illnesses

Participants were enquired about their chronic illnesses suffered during past three months which lasted more than four weeks. Participants with chronic diseases were assigned “1” in a dummy variable “chronic”. Participants without such illnesses were assigned “0” in the same variable.

3.7.5 Presence of Acute Illness

Participants were enquired about any acute illness suffered during the past one month. Participants with such illnesses were assigned “1” in a dummy variable “acute”. Participants without such illness during the past ne month were assigned “0”.

3.7.6 Formal Sector

Participants who are employees were enquired about their employment rights in terms of pension of government employees and Employee Provident Fund (EPF)/ Employee Trust Fund (ETF) in the non-government sector. Being employed in the formal sector should have membership of either one such scheme. When participant is a member of such scheme “1” is assigned to a dummy variable called “formal” and “0” is assigned for participants with no such membership.

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3.7.7 Public sector

Participants who are employed in the public sector was assigned “1” for the dummy variable “govempl” while participants not employed by the government sector were assigned “0”.

3.8 Expected Sign of coefficients

All coefficients were considered individually to predict the effect which it would exert on absenteeism. The summary of expected signs and explanations are given in table 05.

Age taken as a continuous variable, is expected to show a positive relationship. Where increasing age is predicted to increase absenteeism rate which is mainly explained through increasing other commitments outside work and progressive deterioration of health conditions (Martocchio, 1989).

Gender as being measured from dummy variable which measures being male is expected to show a negative relationship. As many studies around the world had concluded that females have a higher absenteeism rate and therefore being male is expected to have a lower rate compared to the reference group (Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008), (Scheil-Adlung & Sander, 2010).

Marital status increases commitments outside the workplace of an individual person. Literature suggests that married people have a lower absenteeism rate than unmarried people (Bridges & Mumford, 2001). However, in the study the size of the family or age of children is not considered. Considering the above fact and the cultural factors, author predicts a higher rate of absenteeism in married individuals.

Education level is expected to have a positive relationship as the author expects that higher education level would translate into better jobs which is lot less physically demanding and also with a better living conditions. All contributing to decreased absenteeism.

Smoking behaviour measured through a dummy variable was expected to have a positive relationship. The expectation was based on research findings published which had concluded that smoking does increase absenteeism (Asay, Roy, Lang, Payne, & Howard, 2016) (Bertera, 1991) (Halpern, Shikiar, Rentz, & Khan, 2001), (Tsai, Wen, Cheng, & Huang, 2005).

Alcohol consumption is also on the lines of smoking and expected to have a positive sign (Australian Faculty of Occupational Medicine, 1999), (Bertera, 1991) (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011).

Health status is measured through a dummy variable which records self-declared health status as good. Therefore, it is expected to have a negative relationship as good health is expected to reduce absenteeism in comparison to the group with bad health which is the comparison group (Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008) (Halford, et al., 2012).

Illnesses are divided to acute illnesses and chronic illnesses which are recorded separately. However, both types of illnesses are expected to have similar effect by increasing absenteeism as poor health to decrease the capacity to work. Thus both variables are expected to show positive sign in results (Kessler, Greenberg, Mickelson, Meneaded, & Wang, 2001).

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Table 5: Details of variables, expected sign and explanation

Definition	Name	Type	Expected Sign	Explanation
Age	Age	Continuous	+	Increasing age to increase health issues and other commitments (Martocchio, 1989)
Gender	Male	Dummy	-	Existing literature [(Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008), (Scheil-Adlung & Sander, 2010)]
Marital status	Mar	Dummy	+	Being married increases commitments (Bridges & Mumford, 2001),
Education – No formal schooling	edu1	Dummy	+	As education level increases, the absenteeism to go down as work to become less physically demanding
Education – up to primary level (max 6 years)	edu2	Dummy	+	
Education- up to GCE (O/L) level (7 to 11 years schooling)	edu3	Dummy	+	
Education- up to GCE (A/L) level (12 to 13 years schooling)	edu4	Dummy	+	
Education – tertiary level **(Reference group)**	edu5			
Smoking Behaviour	Smoke	Dummy	+	Existing literature [(Asay, Roy, Lang, Payne, & Howard, 2016) (Bertera, 1991) (Halpern, Shikiar, Rentz, & Khan, 2001), (Tsai, Wen, Cheng, & Huang, 2005)]
Alcohol consumption	Alc	Dummy	+	Existing literature [(Australian Faculty of Occupational Medicine, 1999) (Bertera, 1991)

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				(Bouchery, Harwood, Sacks, Simon, & Brewer, 2011)]
Self-stated health Very good or excellent	Goodh	Dummy	-	Better health to increase capacity to work [(Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008), (Halford, et al., 2012)]
Presence of chronic disease lasting more than 4 weeks during past 3 months		Dummy	+	Presence of illness increases the risk of being absent [(Kessler, Greenberg, Mickelson, Meneaded, & Wang, 2001)]
Having an acute illness during past 4 weeks	Acute	Dummy	+	Presence of illness increases the risk of being absent
Employment in the formal sector	formal	Dummy	-	Better working conditions
Employment in public sector	govempl		-	More stable employment conditions

3.9 Regression Model

The regression was done with five models. First model (Model A) had only the main variables of the study while fifth model (Model E) had the full specifications and other models with varying number of independent variables. The attributes used as independent variables in each of the five models are given in table 06.

The first model (Model A) focuses on the main variables focussed in the study which are smoking behaviour, alcohol consumption and health status. The second model (Model B) adds chronic diseases to the three variables of the previous model. By the addition of the variable, the model controls the effect of chronic diseases on the three previously described variables. The third model (Model C) focusses on socio-demographic variables and the variable on acute diseases. Fourth model (Model D) combines socio-demographic variables and the main variables of the study as described in Model A. Thereby controlling the effect of socio-demographic variables

on the three main variables of the study. The fifth model (Model E) is the full specification of the regression.

Table 6: Independent variable measures of each regression model

Model A	Model B	Model C	Model D	Model E
Smoking	Smoking	Age	Age	Age
Alcohol	Alcohol	Gender	Gender	Gender
Health Status	Health Status	Marital Status	Marital Status	Marital Status
	Chronic Dis.	Education	Education	Education
		Acute Dis.	Smoking	Smoking
			Alcohol	Alcohol
			Health Status	Health Status
				Chronic Dis.
				Acute Dis.

regression model is as follows,

$$Y^{l} = \beta_{0} + \beta_{1}\,Age + \beta_{2}\,male + \beta\,mar + \beta_{4}\,edu1 + \beta_{5}\,edu2 + \beta_{6}\,edu3 + \beta_{7}\,edu4 + \beta_{8}smoke + \beta_{9}\,alc + \beta_{10}\,goodh + \beta_{11}\,chronic + \beta_{12}\,acute + \epsilon$$

Statistical analysis was done using the above model with logistic regression.

3.10 Sensitivity Analysis

Sensitivity analysis of the model was performed by changing the specification of the dependent variable. Apart from the basic model, four different regressions were performed. The threshold for absence were changed from zero in basic model to 25%, 50%, 75% and 100%.

Depending on the threshold level of each model, the dependent variable was assigned as “1” for regression when the variable “percentage of hours missed” satisfied the set

criteria. Changed specifications of dependent variable in each model is summarized in table 07.

Table 7: Changing specifications of Dependent variable for Sensitivity Analysis

Description	Model 1	Model 2	Model 3	Model 4	Model 5
Threshold level of Dependent Variable from the variable "percentage of hours missed"	> 0	> 0.25	> 0.50	> 0.75	= 1.00

3.11 Subsample analysis

Two subsample analysis were performed using the same data set. The first subsample analysis was done on to assess the effect of formal and informal sector employees on absenteeism and the second was to assess the effect on government employees and private sector employees.

3.11.1 Subsample 1 – Formal sector employees

Formal sector employees are recognised from the government and have better working conditions and benefits. The employers are registered by law and are tax payers. Public sector employees and private sector employees who are registered in the labour department are considered as formal sector. These employees are members of social security systems either as pension scheme of government employees or private sector Employee Provident Fund (EPF) and Employee Trust Fund (ETF) for which contributions made mandatory by labour law. These two groups together constitute the formal sector employees. The informal sector employees do not have such benefits scheme.

Participants were categorized to formal sector and informal sector based on their employment benefits.

A new dummy variable was created as "formal" where the participant was of the formal sector employee "1" was assigned and when the employee was from the

informal sector the variable was assigned as “0”. In the analysis, being employed in the formal sector was taken for regression and the being employed in the informal sector was the reference group.

Logistic regression was performed with the same model with the addition of the new variable “formal” on the sub sample consisting of participants who had responded to the question enquiring of their employment status.

Different specifications were used in the regression to explore Omitted Variable Bias in the model. A total of five specifications tried including the full specifications. The first specification (Model F) has smoking, alcohol usage and health status as the variables which are the main variables focussed in the study. The next model (model G) adds the variable on chronic diseases to control for chronic diseases of the three variables of the first model (Model F). Third model (Model H) focuses on socio-demographic variables including the variable on sector of employment. Fourth model (Model I) combines variables of Model F and Model H whereby the variables in focus are controlled for socio demographic attributes. The last model (Model J) include all the variables explaining the effect of variables further.

Characteristics used in each regression model is summarized in table 8.

Table 8: Characteristics used as independent variables in regression models of subsample 1

Model F	Model G	Model H	Model I	Model J
Smoking	Smoking	Age	Age	Age
Alcohol	Alcohol	Gender	Gender	Gender
Health Status	Health Status	Marital Status	Marital Status	Marital Status
	Chronic Dis.	Education	Education	Education
		Acute Dis.	Smoking	Smoking
		Formal sector	Alcohol	Alcohol
			Health Status	Health Status
			Formal sector	Chronic Dis.
				Acute Dis.
				Formal sector

Regression model for subsample 1 is as follows.

$$Y^{l} = \beta_{0} + \beta_{1}\,Age + \beta_{2}\,male + \beta\,mar + \beta_{4}\,edu1 + \beta_{5}\,edu2 + \beta_{6}\,edu3 + \beta_{7}\,edu4 + \beta_{8}smoke + \beta_{9}\,alc + \beta_{10}\,goodh + \beta_{11}\,chronic + \beta_{12}\,acute + \beta_{13}\,formal + \epsilon$$

3.11.2 Subsample 2 – Public sector employees

The second sub sample analysis was done explore the effect on absenteeism by being a public servant or not. The employees were enquired about their employer whether it is the public service or private sector.

A new dummy variable was created as "govempl" and participants in public sector was assign as "1" on the variable whereas in participants who are employed in the private sector (non-government sector) was assigned as "0". Being employed in the public sector was considered for regression whereas being employed in the private sector (non-government sector) was considered as the reference group.

Logistic regression was performed with the model taken for the study with the inclusion of the new variable "govempl".

Following a similar path to subsample 1, subsample 2 was also performed with different regression models to control the effect of different variables and to explore the effect of Omitted Variable Bias. A total of five models were used in which the fifth model (Model O) was the model with all explanatory variables. The details of characteristics used in the sub sample 2 regression models are listed in table 09.

The first model (Model K), include the main characteristics explored in the study. Therefore, the model has variables relating to Smoking behaviour, alcohol consumption and health status. The next model (Model L) comprise of the variables of the previous model with the addition of variable relating to chronic diseases. This is done to control effect of chronic diseases on the other three variables. The next model (Model M) include socio demographic variables and the variable related to being public

employee. Fourth model (Model N) combines variables of the first model (Model K) with the variables of fourth model (Model N). This model achieves control of socio demographic variables and public sector employment on the three main variable. The last model (Model O) is with the full list of explanatory variables where addition of variables relating to chronic diseases and acute diseases are added to the fourth model (Model N)

Table 9: Characteristics used as independent variables in regression models of subsample 2

Model K	Model L	Model M	Model N	Model O
Smoking	Smoking	Age	Age	Age
Alcohol	Alcohol	Gender	Gender	Gender
Health Status	Health Status	Marital Status	Marital Status	Marital Status
	Chronic Dis.	Education	Education	Education
		Acute Dis.	Smoking	Smoking
		Gov.	Alcohol	Alcohol
		employee	Health Status	Health Status
			Gov.	Chronic Dis.
			employee	Acute Dis.
				Gov.
				employee

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Regression model for subsample 2 is as follows,

$$Y^{l} = \beta_{0} + \beta_{1}\,Age + \beta_{2}\,male + \beta\,mar + \beta_{4}\,edu1 + \beta_{5}\,edu2 + \beta_{6}\,edu3 + \beta_{7}\,edu4 + \beta_{8}smoke + \beta_{9}\,alc + \beta_{10}\,goodh + \beta_{11}\,chronic + \beta_{12}\,acute + \beta_{13}\,govempl + \epsilon$$

4 Results and Discussion

4.1 Socio-demographic characters

The results related to socio-demographic variables are given below in table 10.

Table 10: Distribution of socio-demographic characteristics

Description	Male (%)	Female (%)	Total (%)
Gender	17,750 (65.77)	9,237 (34.23)	26,987 (100.0)
Age			
15-19	495 (1.83)	226 (0.84)	721 (2.67)
20-24	1,508 (5.59)	742 (2.75)	2,250 (8.34)
25-29	1,937 (7.18)	1,007 (3.73)	2,944 (10.91)
30-34	2,621 (9.71)	1,235 (4.58)	3,856 (14.29)
35-39	2,478 (9.18)	1,275 (4.72)	3,753 (13.91)
40-44	2,296 (8.51)	1,361 (5.04)	3,657 (13.55)
45-49	2,385 (8.84)	1,326 (4.91)	3,711 (13.75)
50-54	2,279 (8.44)	1,216 (4.51)	3,495 (12.95)
55-59	1,751 (6.49)	849 (3.15)	2,600 (9.63)
Marital Status			
Married	13,789 (51.08)	6,656 (24.67)	20,445 (75.75)
Unmarried	3,961 (14.69)	2,581 (9.56)	6,542 (24.25)
Education Level			
No formal education	267 (0.99)	261 (0.97)	528 (1.96)
Primary level education	2,373 (8.79)	1,071 (3.97)	3,444 (12.76)
Secondary Level Education	11,388 (42.20)	4,607 (17.07)	15,995 (59.27)
Advanced Level	3,106 (11.51)	2,516 (9.32)	5,622 (20.83)
Tertiary level education	616 (2.28)	782 (2.90)	1,398 (5.18)
Absence in reference week	4,254(15.76%)	1,806 (6.69%)	6,060 (22.46%)
No Absence in Reference week	13,456 (50.01%)	7,431 (27.54%)	20,927 (77.54%)

N= 26,987 **(source: Author's calculations)**

4.1.1 Absence

Absence of participants in the reference week were taken for the study. A total of 6,060 (22.46%) of participants had absence from work in the reference period while 20,927 (77.54%) participants had worked throughout the reference period. Out of the total participants, 15.76% of males and 6.69% of females were absent.

Analysing the gender separately, 24.0% of males and 19.6% of females were absent. The absenteeism for males were higher by 4.4% than that of females.

4.1.2 Gender

The gender distribution of the participants of the study show that out of 26,987 participants 17,750 (65.77%) are male and the remaining participants totalling to 9,237 (34.23%) are female.

According to the last census done in Sri Lanka in the year 2012, economically active population over 15 years was 7,335,432 and out of which 70.76% were male accounting for 5,190,607 whereas females were 2.144,735 constituting the balance percentage of 29.23% (Department of Census and Statistics Sri Lanka, 2013). The labour force survey 2015 estimates a total of 8,214,473 people in the labour force with 5,255,593 males constituting 63.97% and females in labour force as 2,880,542 constituting the balanced percentage of 36.02% (Department of Census and Statistics Sri Lanka, 2016).

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4.1.3 Age

The age distribution of the participants is tabulated at five year intervals whereby dividing age from 15 to 59 into 9 categories. It is noted that the lowest magnitude is observed in the group 15 to 19 years representing 721 (2.67%) participants and the highest in the group 30 to 34 years of age category representing 3,856 (14.29%) participants. The mean age of the participants were 39.37 years.

Relatively lower number of participants are observed in the group of 55 to 59 years of age group which could be due to early retirement as even public servants are given

the option of retiring after age 55 years additional to the natural attrition of the population.

4.1.4 Marital status

Marital status of the participants was analysed by grouping them to two categories of which the first being currently married and the other being currently not married. Out of all participants, 20,445 (75.75%) were currently married out of which 13,789 were male and 6,656 were female. A total of 6,542 (24.25%) participants were not married. Of all male participants of 17,750, a total of 13,789 (77.68%) of them were married, comparatively out of 9,237 female participants 6,656 (72.09%) were married.

4.1.5 Education Level

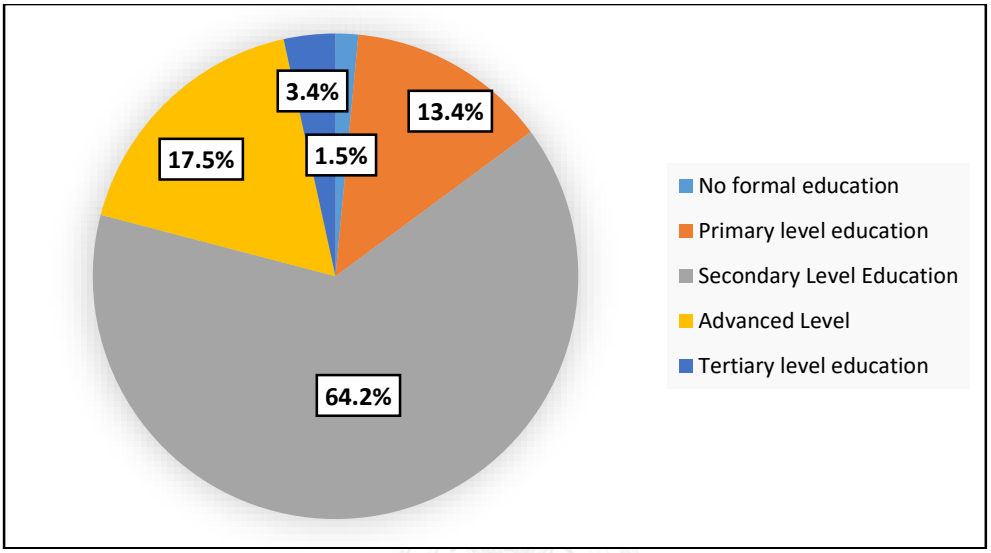
The educational attainment stratified to five levels are shown in the table, where first level indicating no formal education whereas fifth level denoting tertiary level education and the three levels in the middle denoting educational attainment in between. Level with least representation was the group with no formal education accounting for 528 (1.96%) participants and largest being the third group who had education to secondary level which translate to a maximum of 11 years of formal schooling who had a representation of 15,995 (59.31%) participants.

The percentage distribution of level of education among males are given in figure 2 and percentage distribution of education level among females are given in figure 3. Majority of both gender groups were formed by the participants with education to secondary level which had 64.2% and 49.9% for males and females respectively. A considerable difference is observed in the higher education levels in males and females. Advanced level education in males was only 17.5% while in females it was 27.3%. The group which had tertiary level education was 3.4% in males while in females it was 8.4%.

The results show that females with higher education level have an increased representation percentagewise than the males in labour force. It could be due to the

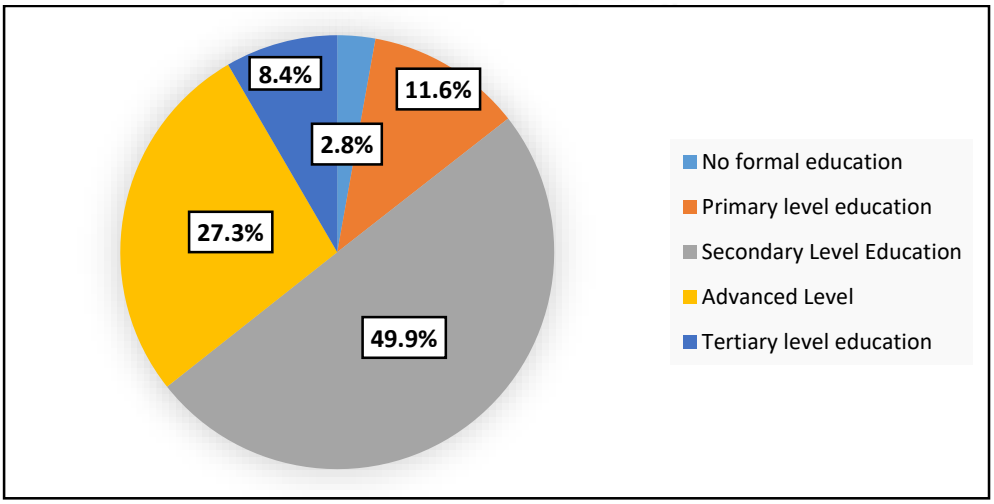
fact that females with higher education levels show high levels of participation in the labour force.

Figure 2: Percentage distribution of education level of Male Participants



(source: Author's calculations)

Figure 3: Percentage distribution of education level of Female Participants



(source: Author's calculations)

With the continued free education policy and its practical implementation, first two categories denoting no formal education and formal education only up to primary level are expected to reduce over time. As by the education policy of Sri Lanka the state is responsible for the provision of education up to the university first degree level and also provision of education is mandatory by law for the age group of 5 years to 14 years which would help to improve the status quo (Ministry of Education, Sri lanka, 2013).

4.2 Behavioural Risk factors

4.2.1 Smoking

Results of the smoking behaviour (all forms of tobacco) of the participants are given in table 11. A total of 3,711 (13.75%) of all participants are engaged in smoking behaviour while 23,376 (86.25%) are non-smokers. Male smokers were 3,667 (13.59%) among the study population while female smokers were only 44 (0.16%). Computing the rate of smoking for males which was at 20.66% and the rate of smoking for females' rate of smoking was 0.48%.

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Table 11: Distribution of smoking behavior of participants

Smoking Behaviour	Male	Female	Total
Currently Smoker	3,667 (13.59)	44 (0.16)	3,711 (13.75)
Currently Non-smoker	14,083 (52.18)	9,193 (34.06)	23,276 (86.25)
Total	17,750 (65.77)	9,237 (34.23)	26,987 (100.0)

(source: Author's calculations)

Non Communicable Disease Risk Factor Survey 2015 done in Sri Lanka by ministry of Health and World Health Organization had concluded that rate of smoking among men is 29.4% and 0.1% among females (Ministry of Health, Nutrition and Indigenous Medicine - Sri Lanka, 2016). In comparing with results of the survey, the rate observed in the survey is quite lower for males but for females it is more than fourfold increase

with the rate identified by the study. Lower rate of male smokers among the study participants could mean that a higher percentage of male smokers exist either unemployed or outside the age group considered and on the contrary higher rate of female smokers could mean that there could be higher rate of non-smoking females either unemployed or outside the age group.

Distribution of smoking behaviour with level of education is given in table 12 with rate of smoking for each educational level. The values indicate a very high percentage of smoking behaviour exhibited by the two lower educational level groups which amount to 22.54% and 25.73% for the groups with no formal education and group with primary level education respectively. As the educational level increases beyond the group of primary schooling only group, rate of smoking behaviour shows a noteworthy decrease. Finally, out of the tertiary level educated only 1.06% of participants indulge in smoking.

Table 12: Distribution of smoking behavior with education level

Education Level	Smokers (%)	Non Smokers (%)	Total (%)
No formal education	119 (22.54%)	409 (77.46%)	528 (100.0%)
Primary level education	886 (25.73%)	2,558 (74.27%)	3,444 (100.0%)
Secondary Level Education	2,434 (15.22%)	13,561 (84.78%)	15,995 (100.0%)
Advanced Level	257 (4.57%)	5,365 (95.43%)	5,622 (100.0%)
Tertiary level education	15 (1.06%)	1,398 (98.94%)	1,384 (100.0%)
Total	3,711 (13.75%)	23,276 (86.25%)	26,987 (100.00%)

(source: Author's calculations)

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4.2.2 Alcohol consumption

Consumption of alcohol among the participants are given in the table 13. Among the participants 3,096 (11.47%) are self-declared alcohol users while 23,891 (88.53%) are non-users of alcohol. On further analysing the gender differences, 17.27% of male participants are alcohol users while only 0.34% of female participants consume alcohol.

Table 13: Distribution of Alcohol consumption among participants

Alcohol consumption	Male (%)	Female (%)	Total (%)
Currently Alcohol user	3,065 (11.36)	31 (0.11)	3,096 (11.47)
Currently Non-user	14,685 (54.42)	9,206 (34.11)	23,891 (88.53)
Total	17,750 (65.77)	9,237 (34.23)	26,987 (100.0)

(source: Author's calculations)

Comparing alcohol usage from the rate identified by the Non Communicable Disease Risk Factor Survey 2015 done in Sri Lanka by ministry of Health and World Health Organization which had identified that 34.8% of men and 0.5% of women of age between 18 to 69 years had used alcohol during a reference period of past 30 days (Ministry of Health, Nutrition and Indigenous Medicine - Sri Lanka, 2016). The rate identified from the current study is significantly lower than the rates described in the risk factor survey. A reason for such disparity could be the operationalization of the variable as the current study had just asked the participant whether he/she usually consume alcohol whereas the risk factor had taken a more objective approach.

4.3 Self-declared health status

Self-declared health status of participants is given in table 14. Out of all participants 21,528 (79.73%) had declared health status as good while the remaining 5,478 (20.27%) had declared their health status as poor.

Table 14: Distribution of self-declared health status

Self-declared health status	Male (%)	Female (%)	Total (%)
Good Health	14,197 (52.61)	7,320 (27.12)	21,528 (79.73)
Poor Health	3,553 (13.17)	1,917 (07.10)	5,478 (20.27)
Total	17,750 (65.77)	9,237 (34.23)	26,987 (100.0)

(source: Author's calculations)

4.4 Regression output of different model specifications

The output of each regression model (model A to Model F) is given below in table 15 with Odds Ratio and Z statistic of each variable.

The first model (Model A), focuses on the main attributes of participants explored in the study which are smoking behaviour ("smoke"), alcohol consumption ("alc") and self-declared health status ("goodh"). The variable related to smoking behaviour has a Z statistic of 7.76 and alcohol consumption is having a Z statistic of 3.61. self-declared health status showed a Z statistic of 3.29. All three variables in the model had attained a significance level of p=0.01 level, hence all three variables were potentially showing association with absenteeism.

Second model (Model B) has an additional variable which relates to chronic diseases. The new addition controls the effect of chronic diseases on the earlier three variables of the previous model (Model A). in the model, smoking behaviour had a Z statistic of 7.74, alcohol consumption had a Z statistic of 3.47 and self-rated health status had a Z statistic of 2.89. Controlling for chronic diseases had caused the Z statistic of all three variables to marginally drop, but had managed to retain their significance level at the prior level of p=0.01. The newly added variable "chronic" has a Z statistic of 6.32 which renders a significance level of p=0.01.

Third model (Model C) variables related to socio demographic characteristics and presence of acute diseases as independent variables. All variables related to Gender, Marital status, education level with no formal schooling ("edu1"), education level confined to primary level school ("edu2"), education level to Ordinary Level translating to 6 to 11 years of schooling ("edu3") and having at least one episode of

acute illness within past one month had all attained significance level of p=0.01. Meanwhile variables related to age and education level to Advanced level in school (“edu4”) had failed to attain significance even at p=0.05 level.

Fourth model (Model D) consisting of main variables of the study earlier included in model A, with sociodemographic variables. Therefore, the model controlled for the effects of socio demographic variables on the main variables of the study identified as “smoke”, “alc” and “goodh”. In the results of the main variables smoking behaviour had a Z statistic of 4.69 and self-declared health status had a Z statistic of 2.76. Even though the Z statistic had dropped in both variables, the attributes manage to retained their significance at p=0.01 level. Variable related to alcohol consumption reduced the Z statistic to 2.05 where its significance level dropped from p=0.01 to p=0.05 level. variables related to sociodemographic variables related to gender, educational level with no formal schooling and educational level with schooling limited to primary level had managed to retain their significance at p=0.01. Significance level of variable related to education level with schooling up to Ordinary Level had reduced to p=0.05 level. Therefore, when controlled for sociodemographic factors smoking and self-rated health managed to retain their significance at p=0.01 level while alcohol consumption behaviour dropped its significance to p=0.05 level.

Fifth model (Model E) is the model with all explanatory variables of the study. Variable related to smoking retains significance at p=0.01 level while variables related to self-rated health and alcohol consumption retains significance level of p=0.05 level in the complete model. Variables related to socio demographics retains significance from the previous model. Variables relating to chronic diseases and acute diseases both remain significance at p=0.01 level. In this model, when controlled for acute diseases, significance of self-rated health decreases its significance from p=0.01 to p=0.05 level.

Table 15: Results of different regression equations with Odds Ratio and Z values

Variables	Model A	Model B	Model C	Model D	Model E
Age			1.002	1.001	0.999
			-1.19	-0.48	-0.8
Male			1.239	1.163	1.182
			(6.68)**	(4.47)**	(4.94)**
Mar			1.128	1.12	1.123
			(3.10)**	(2.91)**	(2.97)**
edu1			1.525	1.424	1.400
			(3.50)**	(2.91)**	(2.76)**
edu2			1.716	1.613	1.569
			(6.81)**	(5.99)**	(5.63)**
edu3			1.221	1.181	1.164
			(2.79)**	(2.32)*	(2.11)*
edu4			0.887	0.88	0.871
			-1.54	-1.65	-1.78
smoke	1.427	1.425		1.245	1.238
	(7.76)**	(7.74)**		(4.69)**	(4.56)**
alc	1.198	1.19		1.108	1.113
	(3.61)**	(3.47)**		(2.05)*	(2.15)*
goodh	0.889	0.902		0.905	0.928
	(3.29)**	(2.89)**		(2.76)**	(2.05)*
chronic		1.259			1.194
		(5.71)**			(4.16)**
acute			1.497		1.423
			(8.45)**		(7.84)**

* p<0.05 **p<0.01 **N=26,987** omitted groups- female, unmarried, tertiary level educated, non-smoker, non-user of alcohol, self-rated health as normal or poor, no chronic disease, no acute disease **(source: Author's calculations)**

4.5 Regression results of full model

For the study, the model with all independent variables was considered and the results of the logistic regression output is given below in table 16.

Table 16: Regression results of the full model

Description	Odds Ratio	Standard error	Z value	p > (Z)	Marginal Effect
Age	0.998733	0.001584	-0.8	0.424	-0.0002
Gender – male**	1.181821	0.040003	4.94	0.000	0.0287
Marital status – married**	1.123259	0.043982	2.97	0.003	0.0200
Education – No Schooling**	1.400243	0.170670	2.76	0.006	0.0579
Education – primary school only**	1.569356	0.125719	5.63	0.000	0.0775
Education – secondary school level*	1.163906	0.083838	2.11	0.035	0.0261
Education – up to Advanced level	0.871089	0.067708	-1.78	0.076	-0.0237
Smoking behaviour- smoker**	1.237715	0.057866	4.56	0.000	0.0367
Alcohol consumer*	1.113119	0.055541	2.15	0.032	0.0184
Self-declared health “Very Good” /“Excellent”/”good”*	0.92824	0.033713	-2.05	0.040	-0.0128
Having a chronic illness **	1.193659	0.050767	4.16	0.000	0.0304
Having an acute illness**	1.423104	0.064014	7.84	0.000	0.0607

N=26,987 * p<0.05 **p<0.01 (source: Author’s calculations)

4.5.1 Age

Age in years had an Odds Ratio of 0.998733 with a Z statistic of -0.800 which was not significant at p=0.05 level. The results pointed that there is no significant relationship between absenteeism and age.

The results of the study fail to find a relationship of absenteeism and age despite the prediction of finding so. The meta-analysis of age and absenteeism relationship had pointed to an inverse relationship between age and worker absenteeism (Martocchio, 1989). There could be many factors like labour force participation rate, early retirements etc. moderating in Sri Lankan context.

4.5.2 Gender

Gender was represented by dummy variable of male which was assigned as "1" for male participants had an Odds Ratio of 1.182 with a Z statistic of 4.94. The association is significant at p=0.01 level indicating that males are more likely to be absent by a probability of 18.2% than the females.

The results of the study had pointed to opposite direction of author's prediction of male participants to have a lower rate of absenteeism compared to the female. The prediction was based on many different studies which had concluded that females are seemed to have higher rate of absenteeism (Hendrix, Spencer, & Gibson, 1994) (Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008) (Scheil-Adlung & Sander, 2010) (European Foundation for the Improvement of Living and Working Conditions, 2010).

Even when higher rate of absence is recorded from females in European region, country wide broad variations in differences of rates are noted across Europe. The study observes that in Belgium and Sweden the rate of absence is as high as 60% compared to males while in Denmark, UK and Slovenia the difference is about 40% while in Estonia and Germany no distinct differences in rates. A distinct reversal of rates is observed in Austria and Malta where males are observed to have a higher absenteeism rate. The study further elaborates that there is no clear explanation and it may reflect the labour market participation pattern (European Foundation for the Improvement of Living and Working Conditions, 2010).

Therefore, the results of the study even though not confirming to majority of studies, it is not entirely a unique finding as some countries are experiencing similar situations.

4.5.3 Marital Status

Marital status was considered as the variable being married which had an Odds Ratio of 1.123 with a Z statistic of 2.97. The value is significant at p=0.01 level. Therefore, the results indicate that being married increases likelihood of absenteeism by 12.3% when compared to unmarried individuals.

The results pointed in the same direction with the author's prediction based on existing literature. Studies have explored family commitments like children and age of children additional to marital status. The study had not explored size of the family and presence of children from the participants.

The increase could be attributed to increased commitments and family responsibilities.

4.5.4 Education level

Education was stratified to five levels. Reference group was considered to be participants with some tertiary education.

The group of participants who had not got any formal schooling, who was represented by the variable "edu1" had an Odds Ratio of 1.400 with a Z statistic of 2.76 rendering a significance level of p=0.01 level. The result indicated that the group is likely to exhibit higher absence rate than the reference group of tertiary educated by a probability of 40%.

Participants with education level up to primary school level are represented by "edu2" variable which had an Odds Ratio of 1.569 with a Z statistic of 5.63 rendering a significance level of p=0.01 level. The values indicated that the group has a higher probability of being absent than the reference group by 56.9%.

Participants with education level equivalent for 6 to 11 years of formal schooling is represented from the variable "edu3". The variable had an Odds Ratio of 1.164 with Z statistic of 2.11 translating to a significance level of p=0.05. The results pointed that the group had a higher likelihood of being absent than the reference group of tertiary educated individuals by 16.4%.

The last group with formal education Advanced Level equivalent of 12 to 13 years of schooling are represented by "edu4". The group had an Odds Ratio of 0.871 with Z statistic of -1.78 and the result for this group indicated that it is not statistically significant even at p=0.05 level.

4.5.5 Health Behaviour

4.5.5.1 Smoking

The variable related to Smoking behaviour had an Odds Ratio of 1.238 with a Z statistic of 4.56 which is statistically significant at p=0.01 level. Thus smoking behaviour shows to increase the likelihood of being absent by a probability of 23.8% compared to non-smoking individuals.

The statistical results had confirmed the authors predictions based on studies performed in different settings which had concluded higher rates of absenteeism associated with smokers (Halpern, Shikiar, Rentz, & Khan, 2001) (Tsai, Wen, Cheng, & Huang, 2005). The results indicate similar association in Sri Lankan context.

World Health Organization estimates prevalence of smoking in Sri Lanka for the year 2015, for males as 28.4% and for females as 0.4% which is lower than the regional average for South East Asian region which is 32.1% and 2.6% for males and females respectively and also less than the global average of 36.1% and 6.8% for males and females (World Health Organization, 2015). Having relatively lower prevalence of smoking especially in females derives an advantage in terms of association with lower absenteeism rates. However, the smoking prevalence could be brought down considerably more for males.

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4.5.5.2 Alcohol consumption Behaviour

Alcohol consumption of the participants were recorded in the variable “alc" which had an Odds Ratio of 1.113 with a Z statistic of 2.15. The result was statistically significant at p=0.05 level indicating that the participants who consume alcohol had a higher likelihood of being absent by a probability of 11.3% compared to individuals who do not consume alcohol.

The results confirm author’s predictions based on past studies focussed on the association between absenteeism and alcohol consumption (Bertera, 1991) (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011).

4.5.6 Health Status

The variable depicting self-declared health status "goodh" had an Odds Ratio of 0.928 with a Z statistic of 2.15. The association was statistically significant at p=0.05 level. Therefore, the results indicated that participants who had stated their self-declared health status as "Good", "Very Good" or "Excellent" had a lower likelihood of being absent than the reference group who had declared their health status as either "Average" or "Poor" by a probability of 7.2%.

Results of the regression confirms author's prediction of inverse relationship between absenteeism and self-rated health status where better ratings of health associating with lower absenteeism rates. The predictions based on prior research which had established the relationship (Eriksson, Von Celsing, Wahlstrom, Janson, & Wallman, 2008) (Halford, et al., 2012).

4.5.7 Chronic Illness

Participants having at least one chronic illness lasting for more than four weeks during the past three months were represented by the variable "chronic" which had an Odds Ratio of 1.194 and Z statistic of 4.16 which is statistically significant at p=0.01 level. The statistical results point that, participants with at least one chronic disease during the past three months are likely to have a higher likelihood of being absent than the participants who did not have such disease conditions by a probability of 19.4%.

The results are consistent with the author's prediction based on research done in other settings (Kessler, Greenberg, Mickelson, Meneaded, & Wang, 2001). The details available about chronic diseases of the participants are limited in the current study.

4.5.8 Acute Illnesses

The variable related to participants having at least one episode of acute illness during the past one month is represented from the variable "acute" which had an Odds Ratio of 1.423 and a Z statistic of 7.84 indicating statistical significance at p=0.01 level. The results point that having at least one episode of acute illness in past month will increase the likelihood of absence by a probability of 42.3%.

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4.6 Sensitivity Analysis

In performing the sensitivity analysis, the regression model was subjected to change of the dependent variable. The threshold of percentage of absent hours of the reference week was set as to be above zero indicating any absence in the basic model (Model 1- Table 17). The threshold of percentage of absence were increased in each model to 25% in model 2, 50% in model 3, 75% in model 4 and as 100% in model 5. The regression results with Odds Ratio and Z value is given for each model in table 17.

According to the resulting output, age did not have a significance in all models even at p=0.05 level.

Gender represented by male from the variable, was significant at p=0.01 level in the first model which had considered absence of all magnitudes. The z value decreased from the first model to fifth. The significance was at p=0.05 level in the third model which indicate absence of 50% magnitude. Thereafter, gender becomes insignificant in model 4 and model 5. The results point that males are more associated with shorter absence compared to females.

Marital status indicated by the variable for people currently married, had remained significance at p=0.01 level throughout all five models indicating a more robust association with absenteeism. Thus the results point that being married increases absenteeism compared to unmarried individuals at all different levels absenteeism analysed.

Education level described from five different levels had a varying significance at different models. The variable “edu4” representing education level up to Advanced Level (12 to 13 years of formal schooling) is significant at p=0.01 level in all five models. The results points that the particular group had a consistently lower absenteeism at all levels considered than the reference group of tertiary educated people.

The education level represented by “edu3” (6 to 11 years of formal schooling) had a significant association at p=0.01 level for absenteeism levels more than 50%, more than 75% and at 100%. At the level of 25% and when all magnitudes (absenteeism more than 0%) considered the association was not significant.

Individuals with education level only up to primary education represented by “edu2” remained significant at p=0.01 level in model 5 which had absence level of 100%. The group was also showing significance at p=0.05 level in model 1, where all magnitudes of absence were taken into consideration.

The group with lowest education level represented by no formal schooling, had remained significant (p=0.05) only at absence level of 100%. In all other models, the group did not show any significance.

Income remained significant in all models at p=0.01 level. The Odds Ratio remained very close to 1 in all models. The results points that even though the association is quite significant, the magnitude of change is quite trivial.

Smoking behaviour is significant at p=0.01 level in the basic model considering all magnitudes of absence. Same level is maintained in model 2 and model 3 (Table 17) where the threshold of absence is set at 25% and 50% respectively. When the threshold increased further, smoking behaviour fail to be significant in model 4 and model 5.

Alcohol consumption behaviour is only significant in model 1 at p=0.05 level. In the other models alcohol consumption behaviour fail to show significant association.

Association with self-declared health status represented with the variable “goodh” fail to show significance with any of the models represented in the analysis.

Presence of chronic diseases with participants had shown a significant association with absence at p=0.01 level in all five regression models. Thus showing a robust association with the variable.

Similarly, acute diseases also show a significant association with absence at p=0.01 level in all five models. Therefore, acute diseases also show a robust association with absence.

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Table 17: Regression results of different specifications of sensitivity analysis

Variable (Absenteeism Level)	Model 1 (> 0)	Model 2 (> 0.25)	Model 3 (> 0.50)	Model 4 (> 0.75)	Model 5 (= 1.00)
Age	0.999	1.000	1	0.999	0.997
	-0.8	-0.22	-0.16	-0.22	-1.06
Male	1.182	1.126	0.95	0.876	0.844
	(4.94)**	(3.14)**	-1.04	(2.29)*	(2.73)**
Mar	1.123	1.078	1.151	1.186	1.236
	(2.97)**	-1.72	(2.40)*	(2.40)*	(2.74)**
edu1	1.4	1.166	1.127	1.009	1.038
	(2.76)**	-1.11	-0.69	-0.04	-0.17
edu2	1.569	1.574	1.278	1.111	1.021
	(5.63)**	(5.08)**	(2.20)*	-0.81	-0.15
edu3	1.164	1.16	0.99	0.914	0.831
	(2.11)*	-1.83	-0.1	-0.77	-1.53
edu4	0.871	0.865	0.758	0.749	0.686
	-1.78	-1.66	(2.51)*	(2.28)*	(2.83)**
Smoke	1.238	1.289	1.261	1.147	1.151
	(4.56)**	(4.95)**	(3.37)**	-1.58	-1.52
Alc	1.113	1.037	0.951	0.895	0.903
	(2.15)*	-0.65	-0.66	-1.15	-0.99
Goodh	0.928	0.955	0.928	0.964	1.007
	(2.05)*	-1.14	-1.41	-0.57	-0.1
Chronic	1.194	1.251	1.279	1.195	1.263
	(4.16)**	(4.82)**	(4.07)**	(2.39)*	(2.93)**
Acute	1.423	1.505	1.464	1.501	1.584
	(7.84)**	(8.38)**	(6.04)**	(5.42)**	(5.82)**

* p<0.05 **p<0.01 **N=26,987** omitted groups- female, unmarried, tertiary level educated, non-smoker, non-user of alcohol, self-rated health as normal or poor, no chronic disease, no acute disease **(source: Author's calculations)**

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4.7 Results of Subsample analysis

4.7.1 Subsample 1 - Formal sector and Informal sector

The first subsample analysis was done to explore the association of formal and informal sector with absenteeism. The distribution of participants in the subsample 1 is given below in table 18.

The subsample consisted of a total of 13,574 participants which is about 50.3% (out of 26,987 participants) of the study population. This indicate that about 50% of participants have not answered the question relating to employee benefits of pension scheme or Employee Provident Fund (EPF) / Employee Trust Fund (ETF). The formal sector had 7,972 (58.73%) participants in the sample whereas informal sector had 5,602 (41.27%) participants.

Table 18: Distribution of participants in subsample 1 - formal and informal sector employment

Sector of employment	Frequency	Percentage
Formal Sector	7,972	58.73
Informal Sector	5,602	41.27
Total	13,574	100.0

(source: Author's calculations)

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The subsample was subjected to logistic regression with five different models to include different combinations of independent variables. The new variable ("formal") added for this subsample was also included. The Odds Ratio and the Z statistic of independent variables in different models are given below in table 19.

The first model (Model F), variables related to smoking and alcohol consumption are having Z statistic of 3.55 and 3.03 respectively, rendering a significance level of p=0.01 level. The variable related to health status fail to achieve significance level even at p=0.05 level.

The addition of a variable related to chronic diseases in the next model (Model G), does not change the significance level of variables related to smoking and alcohol consumption. The result points that after controlling the influence of chronic diseases, effect of smoking and alcohol is significant. The newly added variable “chronic” has an Odds Ratio of 1.473 and a Z statistic of 6.22 which renders a significance level of p=0.01.

Results of the third model (Model H) consisting of socio demographic variables indicate that marital status, education level 2, education level 4, acute disease and working in formal sector are all significant at p=0.01 level. Variables relating to age, gender, education level 1and education level 3 fail to achieve significance even at p=0.05 level.

The fourth model (Model I) consisting of variables in first model (Model F) controlled for the effects of socio demographic variables. Variable related to alcohol consumption reduces its significance level from p=0.01 to p=0.05 level while the variable related to smoking behaviour decreases significance level and in the current model fail to be significant even at p=0.05 level. Marital status, education level 4 and working in formal sector retain their significance at p=0.01 level from the previous model (Model H). Significance level of variable related to education level 2 was reduced to p=0.05 level from its earlier level of p=0.01 significance.

The full specification is given in last model (Model J). Variable related to alcohol consumption retains significance level of p=0.05 level in the complete model. Significance level of p=0.01 level is retained by the variables related to marital status, education level 4, chronic diseases, acute diseases and employment in formal sector. A significance level of p=0.05 is retained by the variable related to education level 2.

Table 19: Odds Ratio and Z statistic of independent variables of regression models of subsample 1

Variables	Model F	Model G	Model H	Model I	Model J
Age			1.002	1.001	0.998
			-0.82	0.55	-0.79
Male			1.030	0.974	0.985
			-0.62	-0.54	-0.30
Mar			1.311	1.3	1.304
			(4.79)**	(4.63)**	(4.66)**
edu1			1.256	1.217	1.209
			-1.42	1.22	1.17
edu2			1.309	1.285	1.261
			(2.62)**	(2.44)*	(2.24)*
edu3			0.942	0.931	0.925
			-0.72	-0.86	-0.93
edu4			0.796	0.799	0.792
			(2.65)**	(2.61)**	(2.70)**
smoke	1.304	1.289		1.098	1.085
	(3.55)**	(3.41)**		1.23	1.08
alc	1.269	1.249		1.179	1.189
	(3.03)**	(2.83)**		(2.11)*	(2.21)*
goodh	0.995	1.008		1.017	1.045
	-0.09	0.15		0.30	0.80
chronic		1.473			1.383
		(6.22)**			(4.90)**
acute			1.517		1.490
			(6.14)**		(5.83)**
formal			0.688	0.688	0.695
			(7.79)**	(7.75)**	(7.52)**

n=13,574 * p<0.05 **p<0.01 omitted groups- female, unmarried, tertiary level educated, non-smoker, non-user of alcohol, self-rated health as normal or poor, no chronic disease, no acute disease, not employed in formal sector **(source: Author's calculations)**

Table 20: Subsample 1 - Regression results of full specification

Description	Variable	Odds Ratio	Standard error	Z value	p > (Z)
Age	Age	0.998111	0.002384	-0.790	0.428
Gender – male	Male	0.985495	0.048547	-0.300	0.767
Marital status – married	mar**	1.303804	0.074236	4.660	0.000
Education – No Schooling	edu1	1.20908	0.195555	1.170	0.240
Education – primary school only	edu2*	1.261376	0.130511	2.240	0.025
Education – secondary school level	edu3	0.924754	0.077393	-0.930	0.350
Education – up to Advanced level	edu4**	0.792252	0.068283	-2.700	0.007
Smoking behaviour- smoker	smoke	1.085203	0.082351	1.080	0.281
Alcohol consumer	alc*	1.188938	0.092992	2.210	0.027
Self-declared health “Very Good” /“Excellent”/”good”	goodh	1.044594	0.057166	0.800	0.425
Having a chronic illness	chronic**	1.38276	0.091433	4.900	0.000
Having an acute illness	acute**	1.489555	0.101755	5.830	0.000
Formal Sector	formal**	0.695328	0.033595	-7.520	0.000
Error term	_cons	0.247753	0.030405	-11.370	0.000

n= 13,574 * p<0.05 **p<0.01 (source: Author’s calculations)

Regression results of the full specification of the subsample 1 is given below in the table 20.

Variable relating to age shows an Odds Ratio of 0.999 with a Z statistic of -0.790 which fails to be significant even at p=0.05 level. The result indicate that age is not a factor showing significant association with absenteeism in the population of the subsample. The statistical output of the main sample also suggested age as not a significant factor. Gender represented by the variable including males has an Odds ratio of 0.985 with a Z statistic of -0.300 which also fail to achieve even a significance level of p=0.05. The

results indicate that there is no significant association with male gender in the subsample 1 even though the main sample indicated a strong association of male gender with absenteeism.

Marital status represented with the variable of being married had an Odds Ratio of 1.304 with a Z statistic of 4.660 which is significant at p=0.01 level. Thus in the subsample 1, married people are more likely to be absent by a magnitude of 30.4% than the unmarried individuals of the subsample 1. When compared to the results of the main sample, the subsample had a higher Odds Ratio and a higher Z statistic (main sample - OR 1.123 and Z- 2.97) showing a more significant level association are a more likelihood of being absent.

Education level indicated by variable "edu1" indicates individuals with no formal schooling. The results of the subsample 1 had an Odds Ratio of 1.209 with a Z statistic of 0.196 which fails to achieve significance level of p=0.05. Although the results of the main sample had showed a significant association at p=0.01 level (edu1 in main sample- Odds Ratio 1.4 and Z statistic 2.76), in subsample 1 a significant association is not evident.

Educational attainment limiting to primary school level represented by variable "edu2" has an Odds Ratio of 1.261 with a Z statistic of 2.240 rendering significance at p=0.05 level. Therefore, in the subsample 1, participants with education level confined to primary level of schooling is more likely to be absent compared to individuals with tertiary level education by 26.1%. Comparing to the main sample (edu2 in main sample - Odds Ratio – 1.569 and Z statistic 5.63), in subsample 1 the magnitude of association is decreased in subsample 1.

Participants with education level up to Ordinary Level in formal school (6 to 11 years of schooling) has an Odds Ratio of 0.925 and a Z statistic of -0.930 which fail to achieve significance at p=0.05 level. In main sample the variable was significant at p=0.05 level (Odds Ratio – 1.164 and Z statistic 2.11).

Education up to Advanced Level in school (12 to 13 years of schooling) represented by the variable "edu4" had an Odds Ratio of 0.792 with a Z statistic of -2.700 which achieves a significance level of p=0.01. The result shows that individuals in the subsample 1 with education level at advanced level are less likely to be absent by

20.8% than the tertiary educated individuals in the subsample 1. The same variable in the main sample had failed attain required significance level.

Smoking behaviour represented by variable "smoke" had an Odds Ratio of 1.085 with a Z statistic of 1.080. The variable had failed to achieve required significance level. However, in the main sample, smoking behaviour showed significance at p=0.01 level (Odds Ratio 1.238 and Z statistic 4.56)

Alcohol consumption represented by variable "alc" had an Odds Ratio of 1.189 and a Z statistic of 2.210. Therefore, the variable was significant at p=0.05 level. This result points that in the population of subsample 1, participants consuming alcohol is more likely to be absent by 18.9% than the participants in the group who do not consume alcohol. In the main sample the results were similar (Odds Ratio 1.113 and Z statistic 2.15) to the subsample 1.

Self-declared Health status represented by the variable "goodh" had an Odds Ratio of 1.045 with a Z statistic of 0.800 which fail to achieve required significance even at p=0.05 level. However, in the main sample variable had achieved significance level of p=0.05 (Odds Ratio 0.928 and Z statistic 2.05).

The variable representing chronic diseases had an Odds Ratio of 1.383 and a Z statistic of 4.900. The variable achieved significance at p=0.01 level which indicated that in the subsample 1 population an individual with chronic diseases is more likely to be absent by 38.3% more than a person in the same subsample 1 without such illness. The results of the main sample also had indicated similar inference (Odds Ratio 1.194 and Z statistic 4.16).

Acute diseases represented by variable "acute" is having an Odds Ratio of 1.490 and a Z statistic of 5.830 rendering significance level at p=0.01. The results point that a participant in subsample 1 with acute disease is more likely to be absent with a magnitude of 49.0% than a participant in the subsample 1 without such illness. The main sample also had similar results (Odds Ratio 1.423 and Z statistic of 7.84)

The variable related to being employed in the formal sector ("formal") has an Odds Ratio of 0.695 with a Z statistic of -7.520. Therefore, it assumes significance level of p=0.01. The results points that in the subsample 1, participants employed in the formal

sector are less likely to be absent from a magnitude of 30.5% that f participants in the subsample 1 employed in the informal sector.

The findings are consistent with the prediction. The results could indicate that better working conditions, social security scheme, stable employment etc. in the formal sector translate to lower absenteeism.

4.7.2 Subsample 2 - Public sector and Private sector

The second subsample analysis was performed with the inclusion of the details of the employees on the sector of employment whether public sector or private sector (non-government). The distribution of participants is given in table 21 below.

Subsample 2 consisted with a total of 13,861 participants and out of which 4,625 participants (33.37%) were employed in the public sector where as 9,236 participants (66.63%) were employed outside the public sector.

Table 21: Distribution of participants in subsample 2 – public and private sector employment

Sector of employment	Frequency	percentage
Public Sector	4,625	33.37
Private Sector	9,236	66.63
Total	13,861	100.0

(source: Author's calculations)

Table 22: Odds Ratio and Z statistic of independent variables of regression models of subsample 2

Variables	Model K	Model L	Model M	Model N	Model O
Age			1.004	1.003	1.000
			-1.74	-1.39	-0.01
Male			1.061	0.994	1.005
			-1.28	-0.13	-0.11
Mar			1.291	1.278	1.282
			(4.60)**	(4.40)**	(4.44)**
edu1			1.165	1.117	1.106
			-0.94	-0.68	-0.62
edu2			1.253	1.216	1.191
			(2.18)*	-1.88	-1.67
edu3			0.909	0.891	0.885
			-1.14	-1.36	-1.44
edu4			0.769	0.769	0.764
			(3.02)**	(3.01)**	(3.08)**
smoke	1.319	1.305		1.151	1.138
	(3.76)**	(3.62)**		-1.89	-1.73
alc	1.275	1.253		1.188	1.195
	(3.13)**	(2.91)**		(2.22)*	(2.30)*
goodh	1.003	1.017		1.014	1.042
	-0.06	-0.31		-0.26	-0.76
chronic		1.477			1.392
		(6.32)**			(5.05)**
acute			1.535		1.504
			(6.41)**		(6.07)**
govempl			0.689	0.688	0.693
			(6.99)**	(7.02)**	(6.85)**

n=13,574 * p<0.05 **p<0.01 omitted groups- female, unmarried, tertiary level educated, non-smoker, non-user of alcohol, self-rated health as normal or poor, no chronic disease, no acute disease, not employed in public sector **(source: Author's calculations)**

Table 23: Subsample 2 - Regression results of the full model

Description	Variable	Odds Ratio	Standar d error	Z value	p > (Z)
Age	Age	1.000019	0.002417	0.010	0.994
Gender – male	Male	1.005343	0.048756	0.110	0.913
Marital status – married	Mar**	1.282474	0.071819	4.440	0.000
Education – No Schooling	edu1	1.106356	0.180295	0.620	0.535
Education – primary school only	edu2	1.191346	0.124557	1.670	0.094
Education – secondary school level	edu3	0.885045	0.075095	-1.440	0.150
Education – up to Advanced level	edu4**	0.763787	0.066739	-3.080	0.002
Smoking behaviour- smoker	Smoke	1.138217	0.085217	1.730	0.084
Alcohol consumer	Alc*	1.195207	0.092553	2.300	0.021
Self-declared health “Very Good” /“Excellent”/”good”	Goodh	1.042151	0.056395	0.760	0.445
Having a chronic illness	Chronic**	1.392484	0.091293	5.050	0.000
Having an acute illness	Acute**	1.504484	0.101247	6.070	0.000
Public sector employee	govempl**	0.692739	0.037105	-6.850	0.000
Error term	_cons	0.217558	0.02572	-12.900	0.000

n= 13,861 * p<0.05 **p<0.01 (source: Author’s calculations)

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Subsample 2 was subjected to logistic regression with five different models as described earlier to include different combinations of independent variables for the same dependent variable. A new variable representing employment in the public sector (“govempl”) was added for this subsample analysis. The Odds Ratio and the Z statistic of independent variables in different models are given below in table 22.

The first model (Model K), has the main variables in the study. They are smoking, alcohol consumption and self-declared health status. Out of which smoking behaviour and alcohol consumption are a having Z statistics of 3.76 and 3.13 respectively,

rendering a significance level of p=0.01 level. The variable related to self-declared health status fail to achieve significance level even at p=0.05 level.

Second model (Model L) has an additional variable which relates to chronic diseases. The new addition controls the effect of chronic diseases on the earlier variables. However, additional variable does not change the significance level of variables related to smoking and alcohol consumption. The Z statistics for smoking is 3.62 while for alcohol consumption is 2.91 which is only marginally lower than earlier values. The result points that after controlling the influence of chronic diseases, effect of smoking and alcohol is significant. The newly added variable "chronic" has a Z statistic of 6.32 which renders a significance level of p=0.01.

Third model (Model M) consists of socio demographic variables with presence of acute diseases and employment in public sector as independent variables in the regression. Marital status, education to Advanced level in school ("edu4"), acute disease conditions and employment in public sector are all significant at p=0.01 level. education up to primary school level ("edu2") had attained significance at p=0.05 level while remaining variables relating to age, gender, education level 1and education level 3 fail to achieve significance even at p=0.05 level.

Fourth model (Model N) consisting of variables in first model (Model K) with sociodemographic variables and employment in public sector. Therefore, the model controlled for the effects of socio demographic variables and employment in public sector on the main variables of the study identified as "smoke", "alc" and "goodh". Variable related to alcohol consumption reduced its significance level from p=0.01 to p=0.05 level while the variable related to smoking behaviour decreases significance level and in the current model fail to be significant even at p=0.05 level. Marital status, education level 4 and working in public sector retain their significance at p=0.01 level from the previous model (Model M). Significance level of variable related to education level 2 was reduced from p=0.05 level and in current model fails to achieve significance at required level. Therefore, when controlled for sociodemographic factors

smoking behaviour fail t achieve required significance level while alcohol consumption behaviour manage to retain its significance at p=0.05 level.

Fifth model (Model O) is the model with all explanatory variables of the study. Variable related to alcohol consumption retains significance level of p=0.05 level in the complete model. Significance level of p=0.01 level is retained by the variables related to marital status, education level 4, chronic diseases, acute diseases and public sector employment.

Results of the full model of the subsample 2 is given in table 23.

Age of participants in subsample 2 represented by variable “age” shows an Odds Ratio of 1.000 with a Z statistic of 0.010 which fails to achieve significance even at p=0.05 level. The result indicate that age is not a factor showing significant association with absenteeism in the population of the subsample. The statistical output of the main sample also suggested that age as not a significant factor.

Variable representing Gender is represented as “male” in the regression which has an Odds ratio of 1.005 with a Z statistic of 0.110 which also fail to achieve even a significance level of p=0.05. The results indicate that there is no significant association with male gender and absenteeism in the subsample 2 even though the main sample indicated a strong association of male gender with absenteeism (Odds Ratio 1.182 and Z statistic of 4.94).

Marital status represented with the variable “mar” had an Odds Ratio of 1.282 with a Z statistic of 4.440 which is significant at p=0.01 level. Thus in the subsample 2, married people are more likely to be absent by a magnitude of 28.2% than the unmarried individuals of the subsample 2. When compared to the results of the main sample, the subsample had a higher Odds Ratio and a higher Z statistic (main sample - OR 1.123 and Z- 2.97) showing a more significant level association and a more likelihood of being absent.

Individuals with no formal education represented by the variable “edu1” had an Odds Ratio of 1.106 with a Z statistic of 0.620 which fails to achieve required significance level of p=0.05. Although the results of the main sample had showed a significant

association at p=0.01 level (edu1 in main sample- Odds Ratio 1.4 and Z statistic 2.76), in subsample 2, a significant association is not evident.

Formal education limited to primary school level represented by variable “edu2” has an Odds Ratio of 1.191 with a Z statistic of 1.670 which also fail to achieve required level of significance at p=0.05. The main sample results showed a strong association and a higher likelihood of being absent than the reference group (Odds Ratio – 1.569 and Z statistic 5.63).

Participants with education level up to Ordinary Level in formal school (6 to 11 years of schooling) has an Odds Ratio of 0.885 and a Z statistic of -1.440 which fail to achieve significance even at p=0.05 level. In main sample the variable was significant at p=0.05 level (Odds Ratio 1.164 and Z statistic 2.11).

Education up to Advanced Level in school (12 to 13 years of schooling) represented by the variable “edu4” had an Odds Ratio of 0.764 with a Z statistic of -3.080 which achieves a significance level of p=0.01. The result shows that individuals in the subsample 2 with education level at advanced level are less likely to be absent by 23.6% than the tertiary educated individuals in the subsample 2. The same variable in the main sample had failed attain required significance level.

Smoking behaviour of the participants in subsample 2 represented by variable “smoke” had an Odds Ratio of 1.138 with a Z statistic of 1.730. The variable had failed to achieve required significance level even at p=0.05. However, in the main sample, smoking behaviour showed strong association with significance at p=0.01 level (Odds Ratio 1.238 and Z statistic 4.56)

Alcohol consumption of the participants represented by variable “alc” had an Odds Ratio of 1.195 and a Z statistic of 2.300 which ensured significance at p=0.05 level. This result points that in the population of subsample 2, participants consuming alcohol is more likely to be absent by 19.5% than the participants in the group who do not consume alcohol. In the main sample the results were similar (Odds Ratio 1.113 and Z statistic 2.15) to the subsample 2.

Self-declared Health Status represented by the variable “goodh” had an Odds Ratio of 1.042 with a Z statistic of 0.760 which fail to achieve required significance even at p=0.05 level. The results of the main sample indicated that the variable was significant

at p=0.05 level and individuals declaring their health status as good had a less likelihood of being absent (Odds Ratio 0.928 and Z statistic 2.05).

The variable representing chronic diseases had an Odds Ratio of 1.392 and a Z statistic of 5.050 achieving a significance level of p=0.01. The results pointed that in the subsample 2 an individual with chronic diseases is more likely to be absent by 39.2% more than a person in the same subsample 2 without such illness. The results of the main sample also had indicated similar inference (Odds Ratio 1.194 and Z statistic 4.16).

Participants with acute diseases were represented by variable "acute" is having an Odds Ratio of 1.504 and a Z statistic of 6.070 rendering a significance level of p=0.01. The results point that a participant in subsample 2 with acute disease is more likely to be absent with a magnitude of 50.4% than a participant in the same subsample 2 without such illness. The main sample also had similar results (Odds Ratio 1.423 and Z statistic of 7.84)

The variable related to being employed by the public sector represented by "govempl" has an Odds Ratio of 0.693 with a Z statistic of -6.850 rendering a significance level of p=0.01. The results points that public employees in the subsample 2 are less likely to be absent from a magnitude of 30.7% that of participants employed in the private sector in the subsample 2.

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4.8 Limitations of the study

As the study was based on secondary data generated out of an already performed survey, there were many constraints in aligning study requirements with available data fields. The main fact was that the survey was not primarily designed to study absenteeism.

In capturing data related to absenteeism, the survey had enquired absenteeism related to past one week only. Although it reduces recall bias, the richness of information was reduced by focussing to a very short span of time to relate with absenteeism.

There was a significant constraint in capturing data related to the work environment of the participants. The current study was constraint to exclude organizational level variables from the analysis.

The data related to smoking behaviour also had constraints. The survey did not capture the past history of smoking of the individual including duration of smoking behaviour, whether the person was an ex-smoker, if ex-smoker for how long etc. Availability of such information would have improved the importance of study findings.

Data related to alcohol usage also faced with similar constraints as information related to past history of alcohol usage not enquired thereby limiting importance of information.

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5 Conclusions and Recommendations

5.1 Conclusions

Absenteeism among the labour force of Sri Lanka is evident as observed in other countries.

Socio demographic factors like being married and gender had significant association with different effects compared to other research settings. Being male and married were associated with higher absenteeism.

Age did not have a significant impact on absenteeism which was different from some research observations.

Education level had mixed results where lower levels (no formal education and education up to primary school) showing more significant association with absenteeism compared to the reference group of tertiary level educated.

Smoking behaviour and alcohol consumption behaviour was significantly associated with increased absenteeism.

Self-declared health status indicated that participants who declared as good had lower absenteeism.

Chronic illnesses and acute illnesses both had a significant association with absenteeism.

Being employee of the formal sector was associated with lower absenteeism than employees of informal sector.

Public sector employment was associated with lower absenteeism than the employees outside public sector.

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5.2 Recommendations

The study was made possible by the health questionnaire included for the first time in the labour force survey. To facilitate important analysis, Department of Census and Statistics could do well to make health related questionnaire permanent section of the labour force survey.

Health section of the questionnaire could be further improved by making finer adjustments for the questions to facilitate further analysis.

At workplace or employer level, more initiatives could be taken to reduce tobacco and alcohol usage by the employees. At national level, new ways of minimizing workplace smoking behaviour could be focussed upon which would increase labour productivity.

Health of the workforce is an important factor to focus to get improved output as any type of illness would increase absenteeism. Therefore, special emphasize could be made on preventive health programmes to promote better health. Promotion of healthy diet, physical exercise, regular health check-ups are some of health promoting initiatives that could be implemented at work place level to improve health of employees.

As prior research on absenteeism among labour force in Sri Lanka is not available, more work on the area could be done to explain the dynamics more comprehensively in order to minimize losses due to absenteeism of the labour force.

Absenteeism at should be estimated at national level periodically for monitoring and evaluation.

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APPENDIX

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