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The Effect of Occupational Health and Safety on Employee Engagement with Special Reference to Ceylon Petroleum Corporation in Sri Lanka

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Abstract

Employee engagement got influenced by various factors such as Information and training, safety awareness, employee behaviour, the role of the supervisor, health and safety reporting mechanisms, workplace safety inspection, and workplace environment. Occupational health and safety focuses on preventing work-related injuries and diseases, as well as protecting and promoting healthy workers. Occupational health and safety have recently become a much priority, owing to growing evidence of significant loss and suffering caused by occupational diseases and ill-health in a variety of industries. The objective of the study was to identify the effect of occupational health and safety on employee engagement in Ceylon Petroleum Corporation in Sri Lanka. The sample of the study was 217 operational level employees of sapugaskanda refinery, Kagalle,

Kurunegala, and Kandy Area Office in Ceylon Petroleum Corporation. The study used a cluster sampling method.

The study was conducted in quantitative nature and eight hypotheses were tested using Pearson Correlation Analysis and Multiple Regression Analysis by deploying the SPSS software (version 21). Based on the findings and discussion, most occupational health and safety were found to have been adopted by the organization while employee engagement was a continuous and flexible process that involved operational level employees in Ceylon Petroleum Corporation. The study found that Occupational Health and Safety leads to measurable improvements in workplace employee engagement, and that implementing preventative techniques has considerable human and economic advantages.

Keywords: Occupational Health and Safety, Employee Engagement, Ceylon Petroleum Corporation, Preventative Techniques

1. Introduction

1.1 Background of the Study

Occupational Health and Safety (OHS) is a discipline dealing with the prevention of work-related injuries and disease, and the protection and promotion of health workers. It aims the improvement of working conditions and the environment. Occupational health entails the promotion and maintenance of the highest degree of physical and mental health and social well-being of labours in all occupations (Taderera, 2012)^[92]. Because of the growing evidence of great losses and suffering caused by occupational diseases and ill health in many different sectors of the workforce, occupational health and security have recently been a much higher priority for managers and are concerned at least in part with the increasing number of deaths and accidents at work. OHS is a complex area interacting with a wider range of business interests and concerns. OHS is the most complex field. OHS is confined to the periphery of human resources management, where it overlooks its role, influence, and importance (Boyd, 2003)^[16].

Human, social and financial costs associated with occupational accidents, injuries and illnesses, and major industrial catastrophes have long been a source of concern at every level, from the individual to national and international workplaces. Measures and strategies to avoid, control, reduce or eliminate occupational risks and dangers, and keep pace with technological and economic changes have been developed and applied continuously over the years. However, despite continuous, but slow improvements, accidents, and illnesses are still far too common, with significant human and economic costs. An International Labour Organization (ILO) report recently estimated that there are 2 million job deaths worldwide every year, the highest proportion of them caused by work-related cancer, circulatory, cerebrovascular, and some transmissible diseases. The total annual occupational accident rate is estimated at 270 million, both fatal and non-fatal (Alli, 2008)^[5].

Social security is a comprehensive concept covering countermeasures to occupational accidents and diseases, as well as income loss compensation and expenses increases for injured persons and their families in the post-accident or disease period.

The first efforts to establish a modern system of social security in the world have been to compensate for the damage caused by accidents and occupational diseases. Social insurance schemes have been started in developing countries after World War II for occupational accidents and diseases. However, a large employee ratio is outside of this insurance in developing countries (Fidanci, 2015)^[26].

The world health organization (WHO) reports that more than 160 million new work-related cases are reported every year and that 2.2 million workers are killed every year as a result of work-related illnesses and injury, while 350 thousand such deaths are caused by occupational diseases and accidents, according to the International Labour Organisation. Most companies spend a lot of time and money on the health and safety of workers, but occupational accidents that lead to absenteeism and financial costs, especially in manufacturing firms, have continued to increase (Mwaruta, Karanja, & Kamaara, 2019)^[67].

Chronic diseases of the lungs and heart, as well as cancers, can be detected as major health difficulties owing to toxic fumes in refinery premises, according to the environment, health, and safety (EHS) supervisor. Stress-related skin problems: employees who work on the refinery premises for a long time may develop cutaneous disorders. Toxic gaseous is a primary source of eye discomfort, according to him. High noise generation causes hearing losses for those who directly work with these hazardous conditions in refinery premises. Moreover, unwillingness to use Personal protective equipment (PPE) can also be considered a major safety issue. Especially, bowser and wagon accidents can be identified as another common safety issue on the premises. Fuel fire, electrical wire short-circuits, pipeline leakage, and environmental pollution: water and soil pollution can be commonly seen in refinery premises. Slip trips and falls issues are commonly occurred due to uneven surfaces and elevated working areas of the refinery premises (Thennakoon, Mallawaarachchi, Rathnayake, & De Silva, 2021)^[98].

1.2 Research Problem

Occupational health is the work to ensure that people work on a high level in all occupations, to maintain, continue and develop their mental and social well-being. occupational health puts the welfare of workers, partners, and children at the highest level, develops living standards, safeguards them from unhealthy conditions both at work and in the living sphere, ensures that they work in a suitable workforce for their talents, provides good quality, healthy people and is protected from all sorts of stressors (Fidanci, 2015)^[26].

In Sri Lanka, the health and safety of operational level employees and working conditions and physical surroundings are expected to be healthy and safe, within the scope of occupational health and safety. As a result of occupational accidents and occupational diseases, the material and moral get degraded of both employees and employers. While the risk for the employees may be crucial, productivity and loss of competition, profitability for the employer is therefore directly affected. Occupational health and safety have three main objectives and are one of the most important problems in the business environment. These include employee protection, company protection, and production protection. While ensuring that employee health is protected, a good work environment is ensured, hazards and risks are reduced and undesirable events are

detected before they do take place and are prevented. In terms of production, it means that work continuity and productivity are guaranteed (Şenol, 2019)^[84].

ILO and WHO reports indicated that in manufacturing industries in Sri Lanka, many employees suffer from workplace injuries and property damage resulting in economic crisis (Soehod & Laxman, 2007)^[88]. Every 15 seconds, a worker dies from a work-related accident or disease. Every 15 seconds, 153 workers have a work-related accident. Every day, 6,300 people die as a result of work-related accidents or work-related diseases more than 2.3 million deaths per year. Annually, 317 million accidents occur in the occupation; many of these result in extended absences from work. As a result of the ever-increasing pace of worldwide liberalization of trade and economies, as well technological progress, the problem of occupational accidents and diseases is becoming a more and more global concern, particularly in developing countries

The Ceylon Petroleum Corporation has developed policies, guidelines, and programs that apply and implement for all employees in general. Furthermore, the company is committed to excellence and success in the energy sector through an incentive for best-performing employees and departments. Ceylon Petroleum Corporation has an occupational safety and health program that has been designed to recognize employee engagement. However, the (2018) Industrial Safety Division report shows that the number of accidents related to the workplace, illnesses, and injuries is 1467 and that the implementation of occupational safety and health programs poses challenges. Health care costs have continued to rise, leading to a conflict between the company's requirements to promote greater efficiency and performance and the requirements of the workers to be protected against hazards and accidents at work. Absenteeism due to health reasons often impairs the engagement of employees as sick or injured employees are less likely to work if they try to work. This study seeks to unpack the relationship between occupational safety and health programs which are conducted by the Department of Human Resource Management on the engagement of employees at Ceylon Petroleum Corporation.

1.3 Research Objectives

- To investigate the effect of information and training on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of safety awareness on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of employee behaviour on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of the role of the supervisor on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of health and safety reporting mechanisms on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of workplace safety inspection on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of workplace environment on

employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.

- To investigate the effect of Occupational health and safety on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.
- To investigate the effect of occupational health and safety on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka.

2. Literature Review

2.1.1 Two Factor Theory

One of the primary hypotheses that influence engagement is Herzberg's two-factor theory. According to the hypothesis, two major job traits impact job happiness, while others lead to job discontent. Motivator and hygienic aspects are well-known. Herzberg has pinpointed the factors that lead to job happiness as well as those that lead to job discontent. Motivation factors usually lead to satisfaction, while hygiene factors typically lead to discontent. Achievement, a sense of accomplishment, the type of job itself, the scope of tasks handled, and proportionate progress or advancement are all motivation elements. Types of corporate policy and administration, kind of supervision, type of interpersonal relationship, working circumstances, remuneration, status, security, and personal life are all important hygiene considerations. Job satisfaction and engagement are increased when motivation factors are present, whereas job dissatisfaction and low levels of engagement are present when hygiene elements are present (Renuka, 2021)^[77].

2.1.2 Self Determination Theory (SDT)

The theory of work engagement Researchers Deci and Ryan first proposed SDT in 1985 as a method for analysing employee motivational factors. Employee engagement, human behaviours, and self-determination theory all have a natural connection, according to the study. Employee engagement is influenced by an employee's ability to control their behaviour and goals. It has been established that the level of engagement has a significant impact on the rate of production. The amount of motivation and emotional state has an impact on involvement. Employees are observed to remove their identity, active participation, and the development of new ideas and sentiments, indicating a slow and steady progression toward disengagement. Leaders advocate for the active implementation of SDT in order to create a positive and growth-oriented attitude toward the company (Legault, 2017)^[54].

2.1.3 Occupational Health and Safety

OHS is concerned with procedures and processes that contribute to a healthy work environment by safeguarding, preserving, and promoting the health, safety, and well-being of employees. OHS is critical to the overall improvement of working conditions for employees, as well as any individual or group of individuals who are involved in the work and work environment (Ansah, 2015)^[9]. As a result, OHS is a critical strategy for not only ensuring worker safety and well-being, but also contributing positively to productivity, business image, and social progress (Alli B. , 2008)^[5]. Simply put, healthy workers are more motivated, happier at work, and contribute more to production and services. As a

result, OHS improves the overall quality of life for workers, their families, the company, and society and should not be overlooked (Gilbreath & Karimi, 2012)^[29].

Organizations owe it to their most valuable resource [their employees] to preserve and promote their health and well-being. OHS not only protects the worker's and society's health and safety, but it also improves the company's image and productivity, because a healthy staff is a productive workforce (Anderson & Chun, 2014)^[7]. Employee health and safety, as well as working circumstances and physical settings, are required to be healthy and safe within the scope of occupational health and safety. Employees and employers alike suffer financial and moral damages as a result of industrial accidents and diseases.

Occupational health deals with ill-health arising from working conditions or the environment that slowly accumulates to lead to deterioration of the workers' health. However occupational safety is concerned with the prevention of accidents and minimizing the aspect of the work environment that has the potential of causing immediate violent harm to employees (Armstrong, 2012)^[10]. Occupational health and safety are the concern of human well-being that, this day, industrialization and service giving sectors development is accelerating resulting in workplace health problems booming. Workplace safety and health hazards nowadays are considered a driving force toward finding solutions how to prevent them from the manufacturing industries' employee negative consequences. Occupational health and safety are a multidisciplinary field concerned with safeguarding the health, safety, and well-being of those who work or are employed. All occupational health and safety programs have the same goal: to create a safe working environment. It may also protect co-workers, family members, employers, consumers, suppliers, surrounding communities, and other members of the public who are influenced by the office environment as a side effect (Joykuty, 2017)^[44].

2.1.4 Information and Training

Training will encourage employees to become productive and increase a safer work environment. Training is considered a way to improve working conditions and the working environment at all levels of the company (Alli, 2008)^[5]. Employees' ability to recognize and prevent occupational dangers, accidents, and health problems improves as a result of OHS training. Working accidents, occupational diseases, work-related diseases, and near-misses in the workplace all point to a lack of and/or ineffective OHS training in this context (Arpat & Bertan, 2019)^[11].

Together with the safety climate, training plays a critical role in melding employee behaviour in protecting them from specified hazards/risks. Employees must receive adequate safety and health training to ensure that they are aware of how to avoid injuring themselves or others (Stromme, 2013)^[89]. It's critical that the instructional content goes beyond basic health and safety information and addresses the unique safety and health requirements of the employee's employment and workplace. Employees' attitudes and behaviours toward reducing occupational hazards were established through web-based learning, according to a Clinical Nursing study in Taiwan (Tung, Chang, Ming, & Chao, 2014)^[99].

2.1.5 Safety Awareness

The Oxford Dictionary defines “aware” as “conscious; not ignorant; knowing” and “well-informed” in its shorter version. Knowing, on the other hand, is defined as “the knowledge or familiarity gained through experience,” as well as “a person’s breadth of information” and “theoretical or practical comprehension of a subject, language, or another phenomenon” (Allen, 1990)^[4].

Employee views and judgments regarding personal capacities and responsibilities to avoid dangers in the workplace are influenced by their safety awareness (Dursun, 2013)^[25]. Safety is a responsibility, a commitment, and an obligation to be aware. It’s a combination of common sense, teamwork, and safe work practices. It’s recognizing dangers and demonstrating a desire to take action to mitigate any risks that may exist. In the past, safety was sometimes viewed as an afterthought in manufacturing. Today, it is widely recognized that effectively managing safety issues contribute to an organization’s financial viability and demonstrates a dedication to an organization’s most precious asset: its people. The first step in preventing an accident is to raise safety awareness (Safetyhub, 2021)^[80].

The state of being aware of the dangers, hazards, and repercussions associated with a construction site is known as safety awareness. Safety awareness is a precursor to displays of behaviour, with accidents and incidents being the result of industry behaviour. Situational awareness can be defined in terms of health and safety as an assessment of dangerous working conditions that includes spotting any potential deviations from established workplace norms. As a result, it was advised that situational awareness be included in safety teaching.

2.1.6 Employee Safety Behaviour

Everything a person does that is observable and measurable is referred to as behaviour (Vijayakumar, 2007)^[100]. Safety compliance explains the core activities that must be carried out by employees following occupational, safety, and health requirements to prevent workplace accidents. Safety behaviour describes the behaviour that supports safety practices and activities such as providing safety training (Mahmood, Mohd Isa, Mustafa, & Abdul, 2010)^[55].

Safety behaviour is essential for reducing workplace injuries and indirectly affecting event outcomes before injuries or accidents occur (Johnson, 2003)^[43].

Behaving responsibly has three components: first, the knowledge of how to operate safely; second, the equipment to operate safely; and third, the drive to operate safely. Behaving responsibly has three components: first, the knowledge of how to operate safely; second, the equipment to operate safely; and third, the drive to operate safely. By addressing the latter, psychological therapies try to improve safety performance. These interventions have come in a variety of shapes and sizes. Typically, safety posters and instructional safety initiatives aimed at increasing safety awareness have not been consistently successful. Incentives have been used successfully to improve safety behaviours but can be costly. Furthermore, they are only likely to be beneficial in the short term since they do not always support the internalization of safe attitudes that lead to long-term changes independent of money reward (Marsh, *et al.*, 1995)^[58].

2.1.7 Role of the Supervisor

A supervisor who is aware of workplace hazards and is familiar with safety concerns can play a significant role in ensuring a safe working environment. Supervisors’ understanding of OHS is viewed as a key driver of better safety and injury reduction. Supervisors who are fully committed to safety and who spot problems before they occur can also have a significant impact on injury prevention and other positive safety results. Supervisor feedback might provide unique information about a company’s safety priorities (Yanar, Lay, & Smith, 2019)^[103].

Supervisors who are aware of the workplace risks and dangers and who actively safeguard workers from negative health outcomes can lower the probability of harm in workplaces where workers report OHS vulnerability. Additionally, supervisors that focus on and promote safety help to create a communicative and supportive safe atmosphere. A supervisor who encourages workers to wear personal safety equipment, for example, might be a great resource for workers who are at risk of OHS violations. As a result, we anticipate that direct supervisors who are aware of workplace risks and actively protect their employees will have a favourable impact on injury prevention in the workplace (Huang, *et al.*, 2018)^[37].

Employees who work for supervisors who communicate effectively about safety may have a greater grasp of safe behaviour and the consequences of dangerous behaviour. Furthermore, subordinates who believe they can communicate to their boss about safety issues are more likely to report harmful conditions before they happen.

2.1.8 Health and Safety Reporting Mechanisms

Safety reporting is a proactive practice that is expected of employees in order to ensure a safe working environment (Frese, Garst, & Fay, 2007)^[27].

Internal reporting offers upper management more control over the situation and allows businesses to deal with their malfeasance effectively and responsibly, which is why professors should encourage it. Many academics would normally disclose material to the public if they have lost faith in management’s actions or felt their issues will not be effectively addressed (Miceli & Near, 1994)^[63].

The use of Incident Reporting Systems (IRS) is a critical component in improving patient safety. They exist in all high-risk industries. While the IRS is new to the healthcare industry, analogous systems in the nuclear, railway, fire, and aviation industries have shown to be extremely successful. The IRS premise is simple: they give a framework for identifying risks so that businesses can take steps to mitigate them. IRS provides useful information for identifying potential hazards and learning opportunities. In healthcare, IRS gives frontline caregivers a way to share their issues, giving them a voice that management can work to address (Pham, Girard, & Pronovost, 2013)^[72].

2.1.9 Workplace Safety Inspection

The safety inspection is described in occupational safety textbooks as if the real search for and assessment of flaws is self-evident. The importance of planning the inspection is emphasized, with information regarding previous accidents, a study of operations and possible accidents, worker hazard

identification input, and applicable standards all being taken into account. The notion is that the inspector will intuitively know how to discover, identify, and appropriately assess those threats if they exist. While it may seem naive to conceive of inspection decisions as simple pass-fail options, this is how they are commonly described (Woodcock, 2014) [102].

Labour Inspection is a public duty of the Department of Labour that guarantees that labour laws are followed in the workplace. Its major goal is to persuade social partners of the importance of following the law at work and their joint interest in doing so, using preventive, educational, and enforcement measures as needed. Labour inspectors have the power to influence the establishment of workplaces that are safe, healthy, fair, and productive. The International Association of Labour Inspection (IALI) understands that ethical practices and high professional standards are critical to a Labour Inspectorate's capacity to provide the best possible services to social partners and the general public (Konstantinou, *et al.*, 2020) [52].

2.1.10 Workplace Environment

Because employees spend a major portion of their time at work, the workplace environment has an impact on them in some way. Employees who are content with their work environment are more likely to have positive job outcomes, according to the findings (Kamarulzaman, Saleh, Hashim, & Hashim, 2011) [47].

According to Kohun (1992) [51], The working environment is comprised of the entirety of forces, actions, and other influential elements that are currently and/or potentially competing with the employee's activities and performance. The working environment is the sum of the interrelationships that exist among employees as well as the working environment (Kohun, 1992) [51].

The technical environment, the human environment, and the organizational environment are the three key sub-environments that make up the working environment. Tools, equipment, technological infrastructure, and other physical or technical factors make up the technical environment. Employees can accomplish their obligations and actions because of the technical environment. Peers, individuals with whom employees engage, team and workgroups, interactional challenges, leadership, and management are all part of the human environment (Rameez, Sahifa, & Samina, 2019) [76].

2.2 Employee Engagement

Kahn was the first to coin the term "employee engagement" in 1990. Since then, a slew of corporate consultants and academics have weighed in on the subject of employee engagement. Despite the increased interest and debate, there is currently no single definition for employee engagement, which is filled with discrepancies and overlapping concepts. Employee engagement was first characterized as "the harnessing of organization members' selves to their work roles; in engagement, workers employ and express themselves physically, cognitively, and emotionally throughout role performances" by Kahn (1990). Employee engagement has been characterized by others as the emotional and intellectual commitment to the organization (Suan Choo, Mat, & Al-Omari, 2013) [90].

Employee engagement is generally defined as the level of commitment and participation of employees in their

organization. It is considered to be one of the top topics of management interest. The staff has an emotional connection with the organization because of their good attitude towards their tasks. Employees, therefore, exceed the duty call for the excellent accomplishment of their assigned task. Shows some of the advantages of engagement. First, engagement is the key to the success and competitive advantage of an organization. Besides, opined that organizations with engaged employees have higher shareholder returns, profitability, productivity, and customer satisfaction (Gyensare, Anku-Tsede, Boakye, & Twumasi, 2018) [32]. Employee engagement is described as an employee's level of dedication and involvement in their organization and its principles in general. When an employee is engaged, he is aware of his role in the organization's goals and works to push his co-workers to achieve those goals as well. The positive emotional connection of an employee to his or her work is defined as the employee's good attitude toward his or her workplace and its value system. Meaningfulness (work elements), safety (social components, including management style, process, and organizational norms), and availability (work elements) are all necessary for an employee to be brilliantly engaged, according to Kahn (individual distractions) (Anitha Jagannathan, 2014) [8].

2.3 Empirical Research

Some theoretical and empirical research on the researcher's topic has been conducted.

Michael, Olivia, Kwame, and Evelyn (2019) have researched SMEs in Ghana. That, that study aims to close this gap by examining the influence of occupational health and safety management on employee engagement in Ghana's small and medium-sized businesses. To prove the hypothesis, they evaluated cross-sectional data from 136 employees. The structural equation model demonstrated that occupational health and safety have a positive impact on intellectual, social, and affective engagement. Intellectual engagement, on the other hand, was the criteria variable that was most influenced by the aspects of engagement. According to the report, SMEs' promoters, owners, and/or managers should consider their employees' health and safety issues as a top priority in order to get the most out of them (Gyensare, Anku-Tsede, Boakye, & Twumasi, 2018) [32].

According to a study by Anitha J. (2014) [8] in India, the regression analysis results show that the independent variables identified as influencing employee engagement have a substantial impact on determining the level of employee engagement. This emphasizes the necessity of a positive work environment and good interpersonal harmony among co-workers. The desired work environment is both physically and emotionally safe, allowing employees to be more engaged at work (Anitha, 2014) [8].

Robertson and Cooper (2010) [78] have researched the integration of employee engagement and psychological well-being in the UK. Accordingly, the majority of existing employee engagement viewpoints include little that is directly related to well-being and reflect a restricted, commitment-based definition of engagement. This view is overly focused on organizational benefits. A broader definition of engagement that incorporates employee well-being offers a better foundation for creating long-term benefits for individuals and businesses. Integrating employee engagement and psychological well-being into the concept of full engagement could be a realistic way to

improve organizational effectiveness. Both elements have been connected to positive organizational outcomes in studies, and it is theoretically possible that the combined influence of both components is stronger than either factor alone (Robertson & Cooper, 2010) [78].

3. Methodology

3.1 Research Hypotheses

The research developed eight hypotheses as follows.

H1: There is a positive impact of information and training on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

H2: There is a positive impact of safety awareness on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

H3: There is a positive impact of employee behaviour on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

H4: There is a positive impact of role of the supervisor on

employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

H5: There is a positive impact of health and safety reporting mechanisms on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

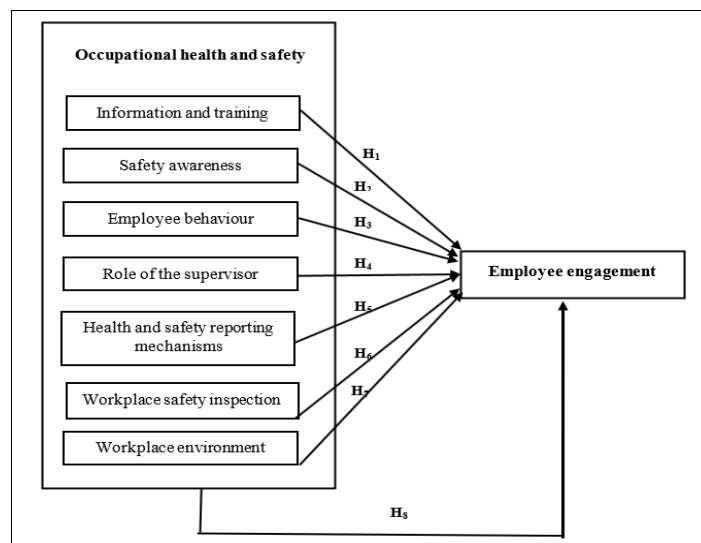
H6: There is a positive impact of workplace safety inspection on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

H7: There is a positive impact of workplace environment on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

H8: There is a positive impact of occupational health and safety on employee engagement of operational-level employee in Ceylon Petroleum Corporation in Sri Lanka.

3.2 Conceptual Framework

A conceptual framework is a framework that the researcher believes best explains the natural course of the subject under investigation (Adom, Hussein, & Agyem, 2018).



Source: Author Compiled

Fig 1: Conceptual Framework

3.3 Operationalization Table

Table 1: Operationalization Table

Variables		Indicators	Source
Occupational health and safety	Information and training	My employer usually informs me to take precautions to protect myself when I perform my duties.	(Mojapelo, Mafini, & Dhurup, 2016) [65]
		My employer usually provides new employees with health and safety training.	
		Employer trained me about the correct use of Personal Protective Equipment (PPE).	
		My employer regularly informs me about Standard Operating Procedure (SOP) when it comes to performing my task.	
		My employer provides regular refresher training on health and safety.	
		My employer trained me to recognize hazards at work.	
		Training has changed my behaviour about how I view health and safety.	
	Safety awareness	I have sufficient knowledge of the Occupational Health and Safety Act.	
		We have a copy of the OSHA on the employer's premises.	
		I know my rights as an employee when it comes to health and safety issues.	
		We are provided with the necessary skills as employees in the organization to perform our work safely.	
		I usually follow safety procedures at work.	
		We have a health and safety representative in my workplace.	
		All employees are involved in the planning of health and safety.	
		Employee awareness of OSHA will lead to a reduction of accidents.	
		Safety meetings are held regularly with employees.	
		Safety awareness campaigns are held on a regular basis.	
	Employee behaviour	I usually follow safety procedures when doing my job.	
I prefer to spend more time on a task to ensure it is done safely; rather than rushing to complete a task.			
Employees sometimes ignore safety procedures.			

		Some employees get away with unsafe conduct in the workplace.	
		Performing my work safely has become a habit for me rather than a challenge.	
		As an employee I am fully aware of hazards in my daily job.	
		Every employee is responsible for their own safety in the organization.	
	The role of supervisors in health and safety	My supervisor takes employees' health and safety very seriously.	
		Supervisors perform risk assessments on a regular basis.	
		Supervisors encourage employees to adhere to the OSHA.	
		Supervisor listens to employees' safety concerns in the organization.	
	Occupational health and safety reporting mechanism	There is a formal health and safety reporting mechanism in the company.	
		Reported health and safety issues are attended to promptly.	
		Employees are encouraged to report accidents that occur at work.	
	workplace safety inspection	Safety inspections take place regularly at work.	
		Regular inspections encourage the employer to comply with OSHA.	
		Labour inspectors are allowed access in the workplace.	
		Safety signs are visible for everyone to see.	
		Inspectors impose fines and penalties when the employer is non-compliant.	
		Risk assessment is regularly carried out on the employer's premises by SHE representatives.	
	workplace environment	There is enough ventilation at my workstation.	
		I am comfortable with the room temperature.	
		I am satisfied with the level of hygiene at my workplace.	
There is sufficient lighting at my workplace.			
Chemical substances are clearly marked.			
Employee Engagement	Employee Engagement	At work, I feel bursting with energy	
		At my job, I feel strong and vigorous	
		I am enthusiastic about my job	
		My job inspires me	
		When I get up in the morning, I feel like going to work	
		I feel happy when I am working intensely	
		I am proud of the work that I do	
		I am immersed in my work	
		I get carried away when I am working	

(Albrecht, Breidahl, & Marty, 2018)^[2]

Source: Author compiled

3.4 Research Design

3.4.1 Research Philosophy

Positivism and interpretivism are two philosophical perspectives commonly utilized in academic research, with positivism assuming that knowledge is independent of the subject being studied and interpretivism claiming that individual observers have their own perception and understanding of reality (Testing, 2020). Since the objective of this study is to investigate the effect of occupational health and safety on employee engagement of operational-level employees in Ceylon Petroleum Corporation in Sri Lanka. Occupational health and safety, which leads to research, is an independent variable, and this study develops eight hypotheses that seek to follow the positive research philosophy and understand those eight hypotheses.

3.4.2 Research Approach

There are two types of research approaches such as deductive approach and inductive approach. Researchers used the deductive approach for quantitative studies. It involves the development of a theory that is subjected to a rigorous test. It is the dominant research approach in the natural sciences, where laws present the basis of explanation, allow the anticipation of phenomena, predict their occurrence, and therefore permit them to be controlled (Collis & Hussey, 2003)^[19].

3.4.3 Research Choice

The concentration on numeric (numbers) versus non-numeric (words) data is one technique to identify the two. Any data gathering tool (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data is referred to as

quantitative. The researcher considers quantitative research type, because we generate statistics through the use of large-scale survey research, using methods such as questionnaires.

3.4.4 Research Strategy

Introducing research methods, Saunders *et al.* (2016) suggest an experiment, survey, archival research, case study, ethnography, action research, grounded theory, and narrative inquiry to be the main strategies for research. However, research strategies in the field of future studies can be distinguished in a slightly different manner (Melnikovas, 2018)^[61]. Surveying has been selected as the data collection strategy for this research. Data collected through the questionnaires.

3.4.5 Time Horizons

Time horizon can be either cross-section or longitudinal. Cross-sectional type is widely applied for quantitative studies while longitudinal is applied for qualitative studies. This study was conducted as a cross-sectional study since it will be conducted for a very short period of time.

3.4.6 Techniques and Procedures

The last layer – techniques and procedures – takes the research design towards data collection and analysis by following the research onion step by step.

Data Collection

Primary Data was collected mainly by use of structured questionnaires Secondary data collecting from Annual reports, websites, and other reports and journal articles. The questionnaire was designed so that it could measure the study variables in the research model including Employee

engagement, Information and training, Safety awareness, Employee behaviour, Role of supervisor, Health and safety reporting mechanism, Workplace safety and Workplace environment.

The questionnaire for measuring employee engagement was also a standard questionnaire which was developed by Mojapelo, Mafini and Dhurup (2016) [65] and it contained nine (9) questions to measure employee engagement. The other variable measuring questionnaire was developed by Albrecht, Breidahl and Marty (2018) [2]. It contained forty-two (42) questions which measured dimensions of above OHS.

The questionnaire was consisted of three sections,

1. Demographic factors - 04 Questions
2. Occupational health and safety - 42 Questions
3. Employee engagement - 09 Questions

Section 01 of the questionnaire was designed to gather data on demographic factors such as gender, age, working years and working place to get an understanding about the sample. Section 02 and 03 of the questionnaires was designed to gather data on occupational health and safety (OHS) and employee engagement (EE). It was designed based on Likert scale method and the Likert scale examine how strongly respondents agree or disagree with statement on a five points scale. Respondent of the sample had the ability to indicate their opinions as 1 - Strongly Disagree, 2 - Disagree, 3 - Moderate, 4 - Agree and 5 - Strongly Agree.

Population and Sampling

According to the cadre of Ceylon Petroleum Corporation, the target population of the study was 500 operational level employees.

It is a difficult task to collect data from all the employees in Ceylon Petroleum Corporation. Because of that sample will be selected by the researcher from the population. The researcher decides the sample size using the Morgan table. The growing demand for a representative statistical sample in empirical research has created a need for a reliable method of estimating sample size. To fill the gap, Krejcie and Morgan (1970) devised a table for calculating sample size for a given population that could be easily referenced.

The sample of 217 male and female operational-level employees will be selected by using the cluster sampling method. This is because respondents of the sample are selected from a few branches from all over Ceylon Petroleum Corporation and select the operational level employees as a sample from them.

4. Data Analysis

4.1 Reliability and Validity of the Pilot Study

To access the reliability and validity of the measuring instrument of this study, a pilot study was conducted. For that purpose, the survey questionnaire was circulated amongst and piloted with a group of thirty respondents who were selected randomly. The generated results of the reliability and validity test are depicted below.

Table 2: Reliability and validity of the pilot study

Variables	Number of items used	Cronbach's Alpha
Information and training	7	0.853
Safety awareness	10	0.897
Employee behaviour	7	0.853
Role of supervisor	4	0.814
Health and safety reporting mechanism	3	0.738
Workplace safety	6	0.777
Workplace environment	5	0.754
Employee Engagement	9	0.867

According to the table 2, Cronbach's Alpha is for variables of Information and training, Safety awareness, Employee behaviour, Role of supervisor, Health and safety reporting mechanism, Workplace Safety, Workplace Environment, and Employee Engagement. All they are greater than 0.7 which means all the measuring scales which were used to test the quality of particular variables have better internal uniformity. Then all Cronbach's Alpha values are greater than 0.7. It indicates all the questions are highly reliable to analyse.

It is observed that all the independent variables and Dependent variable can be used to measure the variables with great reliability. According to table 4-1, all the variables Cronbach's alpha is above 0.7 which meant the study measuring tool was reliable.

4.2 Analysis of the Demographic Variables

The questionnaire was distributed randomly among 100 respondents both male and female respondents. Out of it, 70 were male and 30 were female respondents which are 70% and 30% of the total respectively and the female respondent's percentage is lower compared to the male respondent's respondents from the age category of selected operational level employees. From the respondents, 12% of employees were 25 and below age category, 38% employees were 26-34 age category, 30% employees were 35-44 age category, and 20% employees were 45 and above age category. More respondents are in the 26-34 age categories. 13% of respondents were Sapugaskanda Refinery, 54% of respondents were Kagalle area office, 13% respondents were Kurunegala area office, and 20% respondents were Kandy area office. So, the sample is selected to represent the operational level employee population. , 46% of respondents were 0-5 years of work experience, 40% of respondents were 6-10 years of work experience and 14% of respondents were more than 10 work experience. More respondents are in 0-5 years of work experience and a low number of respondents from more than 10 work experience.

4.3 Pearson Correlation Analysis

This section examines the relationship between independent variables and dependent variables to test the hypothesis of the research. Therefore, Pearson correlation analysis was used and its results are represented in table 3.

Table 3: Result of Pearson’s Correlation Analysis

		Correlations							
		EE	IT	SA	EB	ROS	RM	WSI	WE
EE	Pearson Correlation	1	.982**	.967**	.976**	.913**	.789**	.913**	.921**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N		217	217	217	217	217	217	217
IT	Pearson Correlation		1	.988**	.998**	.915**	.857**	.863**	.955**
	Sig. (2-tailed)			.000	.000	.000	.000	.000	.000
	N			217	217	217	217	217	217
SA	Pearson Correlation			1	.987**	.935**	.867**	.853**	.967**
	Sig. (2-tailed)				.000	.000	.000	.000	.000
	N				217	217	217	217	217
EB	Pearson Correlation				1	.909**	.871**	.851**	.960**
	Sig. (2-tailed)					.000	.000	.000	.000
	N					217	217	217	217
ROS	Pearson Correlation					1	.704**	.905**	.833**
	Sig. (2-tailed)						.000	.000	.000
	N						217	217	217
RM	Pearson Correlation						1	.536**	.898**
	Sig. (2-tailed)							.000	.000
	N							217	217
WSI	Pearson Correlation							1	.757**
	Sig. (2-tailed)								.000
	N								217
WE	Pearson Correlation								1
	Sig. (2-tailed)								
	N								

** . Correlation is significant at the 0.01 level (2-tailed).

It was made the Pearson Correlation Analysis measure the relationship between independent variables (Information and training, Safety awareness, Employee behaviour, Role of the supervisor, Health and safety reporting mechanisms, Workplace safety inspection, Workplace environment) and dependent variable (employee engagement).

Workplace safety inspection and Workplace environment. In contrast, 2% of employee engagement was not explained by Information and training, Safety awareness, Employee behaviour, Role of the supervisor, Health and safety reporting mechanisms, Workplace safety inspection, and Workplace Environment.

4.4 Multiple Regression Analysis

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.991 ^a	.982	.982	.04148	2.035

a. Predictors: (Constant), WE, WSI, RM, ROS, IT, SA, EB
 b. Dependent Variable: EE

Source: Survey Data 2022

In Table 4, R square value was 0.982 which depicted 98% of the dependent variable: employee engagement was explained by independent variables: Information and training, Safety awareness, Employee behaviour, Role of the supervisor, Health and safety reporting mechanisms,

Table 5: ANOVA

ANOVA					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	19.973	7	2.853	1658.742	.000 ^b
Residual	.360	209	.002		
Total	20.333	216			

a. Dependent Variable: EE
 b. Predictors: (Constant), WE, WSI, RM, ROS, IT, SA, EB

Source: Survey Data 2022

Analysis of Variance (ANOVA) test shows whether the regression model is significant or not, if the output P-value is less than 0.05 model is significant. According to this study, all P-value is less than 0.05, (a significant level of 0.000) so this model is significant.

Table 6: Coefficients

		Coefficients						Collinearity Statistics			
Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.	95.0% Confidence Interval for B		Tolerance	VIF
		B	Std. Error	Beta				Lower Bound	Upper Bound		
1	(Constant)	.174	.045			3.837	.000	.085	.263		
	IT	.650	.159	.705		4.093	.000	.337	.963	.003	350.760
	SA	.168	.134	.188		1.255	.211	-.096	.432	.004	264.537
	EB	.060	.149	.065		.403	.687	-.234	.354	.003	307.884
	ROS	-.150	.043	-.190		-3.523	.001	-.234	-.066	.029	34.475
	RM	-.003	.028	-.003		-.094	.926	-.059	.053	.068	14.707
	WSI	.307	.032	.321		9.596	.000	.244	.370	.076	13.233
	WE	-.072	.063	-.078		-1.137	.257	-.196	.053	.018	54.977

a. Dependent Variable: EE

Source: Survey Data 2022

Table 6 shows the coefficient table of the regression analysis. B value of the table represents the degree to which extent the dependent variable can be affected by a certain independent variable while other independent variables remain constant. B coefficient for Information and training is 0.650 indicates that increasing 1 unit of information and training causes to increase employee engagement in 0.650 units while other independent variables remain constant. This conclusion can be done with a 100% confident interval since the significant level is 0.000. Safety awareness involves a 0.168 B value, which denotes that when safety awareness increases by 1 unit employee engagement also increase by 0.168 units and vice versa. This conclusion can also be done with a 79% confident interval since the significant level is 0.211. Employee behaviour has a 0.060 B value which indicates that when employee behaviour increases by 1 unit, employee engagement increases by 0.060 units while other independent variables remain constant and vice versa this conclusion can also be done with a 32% confident interval since the significant level is 0.687. The role of the supervisor has a -0.150 B value which indicates that, when the role of the supervisor increases by 1 unit, employee engagement increases by -0.150 units while other independent variables remain constant and vice versa this conclusion can also be done with a 99% confident interval since the significant level is 0.001. Health and safety reporting mechanisms have a -0.003 B value which indicates that when health and safety reporting mechanisms by 1 unit, employee engagement increases by -0.003 units while other independent variables remain constant and vice versa this conclusion can also be done with an 8% confident interval since the significant level is 0.926. Workplace safety inspection has a 0.307 B value which indicates that when workplace safety inspection by 1 unit, employee engagement increases by 0.307 units while other independent variables remain constant and vice versa this conclusion can also be done with a 100% confidence interval since the significant level is 0.000. Finally analysing the B coefficient for the workplace environment has a -0.072 B value which indicates that, when the workplace environment increases by 1 unit, employee engagement decreases by -0.072 units while other independent variables remain constant and vice versa this conclusion can also be done with 75% confident interval because the significant value is 0.257 which denote the probability of rejecting this conclusion is 25%.

Based on the results, the regression equation can be written as follows.

$$Y = \beta_0 + X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_4\beta_4 + X_5\beta_5 + X_6\beta_6 + X_7\beta_7 + \epsilon$$

- Y = Employee engagement (EE)
- β_0 = Constant (The intercept of Y)
- X1 = Information and training (IT)
- X2 = Safety awareness (SA)
- X3 = Employee behaviour (EB)
- X4 = The role of the supervisor (ROS)
- X5 = Health and safety reporting mechanisms (RM)
- X6 = Workplace safety inspection (WSI)
- X7 = Workplace environment (WE)
- ϵ = Error

$$EE = 0.174 + 0.650 (IT) + 0.168 (SA) + 0.060 (EB) + (-0.150 (ROS)) + (-0.003 (RM)) + 0.307 (WSI) + (-0.072 (WE)) + 0.045 (Error)$$

4.5 Hypothesis Testing

In this study, simple regression analysis and Pearson’s correlation analysis were used for hypothesis testing. All hypotheses in this research were concerned with a significant relationship.

Table 7: Summary of Hypotheses Testing

Hypothesis	Result
H1 ₁	H1 ₁ : Accepted
H2 ₁	H2 ₁ : Accepted
H3 ₁	H3 ₁ : Accepted
H4 ₁	H4 ₁ : Accepted
H5 ₁	H5 ₁ : Accepted
H6 ₁	H6 ₁ : Accepted
H7 ₁	H7 ₁ : Accepted

5. Discussion

This study was carried out to find out the effect of occupational health and safety on employee engagement with eight (08) research objectives. This section consists of a discussion on the demographic characteristics of the respondents, the impact of independent variables (Information and training, Safety awareness, Employee behavior, Role of supervisor, Health and safety reporting mechanism, Workplace Safety, and Workplace Environment) on Dependent variable (Employee Engagement).

The objective of the study was to establish the effects of occupational Health and Safety on employee engagement at Ceylon Petroleum Corporation. The findings of the study are in line with the literature review and the results have established there is a relationship between occupational Health and Safety and employee engagement. A questionnaire was developed and distributed to a selected sample of Operational Level Employees to collect data for the analysis.

When considering demographic factors, male Operational Employees represent a large portion of the research sample than females. More respondents are in the Kagalle area office and Low respondents are in Sapugaskanda Refinery and Kurunegala area office. Most of the Employee's Age Category was 26-34 age category. Most of the Operational Level Employees have 0-5 years' Work Experience. Cronbach's Alpha is for Variables Information and training, Safety awareness, Employee behaviour, Role of supervisor, Health and safety reporting mechanism, Workplace Safety, Workplace Environment, and Employee Engagement are 0.853, 0.897, 0.853, 0.814, 0.738, 0.777, 0.754 and 0.867 respectively. All Cronbach's Alpha values are greater than 0.7.

The mean value of Information and training was 4.2725, Safety awareness 4.2747, Employee behaviour 4.2686, Role of supervisor 4.2189, Health and safety reporting mechanism 4.3502, Workplace Safety 4.0960, and Workplace environment 4.2710. It is responded that these variables have impacted Employee Engagement. This study used Correlation analysis for Hypothesis Testing.

The study's findings show that Ceylon Petroleum Corporation carried out occupational health and safety

surveillance. According to Foot and Hook (2008), integrating health and safety monitoring programs can assist eliminate dangers and ensure workplace safety, resulting in healthier and more productive employees.

The findings demonstrate that Ceylon Petroleum Corporation gives due consideration to its employees' occupational health and safety. Effective organizational health and safety management can assist increase employee morale and give them faith in the organization's leadership. Because workers are the most afflicted persons due to their direct involvement in hazard-prone activities, management could improve employee work behaviour and faith in management by providing a safer work environment.

6. Conclusion

From the findings and discussion most occupational health and safety were found to have been adopted by the organization while employee engagement was a continuous and flexible process that involved all levels of operational level employees in Ceylon Petroleum Corporation. The study found that Occupational Health and Safety leads to measurable improvements in workplace health and safety, and that implementing preventative techniques has considerable human and economic advantages. Total commitment on the part of management to making health and safety a priority is essential to a successful occupational health and safety in the workplace. It is only when management plays a positive role that workers view such as a worthwhile and sustainable exercise.

The study also established that there is health and safety Right and Protection in the workplace. Storey (1995) said that organizations that are committed to health and safety have Laws and Legislations that guide both management and employees in ensuring that the working environment is free of injury and hazards for their employees, and in order for the laws to be implemented, it is necessary to integrate them with the organization strategy, as health and safety is a part of the business strategy, as well as the continuous improvement circle that drives a company towards excellence.

7. Recommendations

Occupational health and safety must aim at both prevention and protection. Efforts should be concentrated on primary prevention in the workplace first and foremost. Safe and healthy workplaces and working environments should be planned and designed. Occupational health and safety must be improved on a continuous basis. This is required to ensure that company health and safety policies, laws, and technical standards for preventing occupational injuries, diseases, and deaths are updated on a regular basis to reflect social, technical, and scientific advancements, as well as other changes in the workplace. It is best done by the development and implementation of activities that align with the Occupational Health and Safety Act.

Education and training are essential components of a safe and healthy workplace. Workers and employers must be educated on the significance of implementing safe working processes, as well as how to go about doing so. Trainers must be educated in areas of specific importance to Ceylon Petroleum Corporation departments. As a result, they will be able to handle the unique occupational health and safety issues.

Ceylon Petroleum Corporation should establish a Joint Health and Safety Committee, which will serve as a useful forum for discussion and coordinated action to promote health and safety. Cooperation between management and workers or their representatives at work in the sphere of occupational health and safety is critical to ensuring a healthy working environment. It may also aid in the creation and maintenance of a positive social atmosphere as well as the achievement of larger goals.

Based on these findings, it is suggested that the employer provide a safe working environment since employees feel safe at work. Employers should also guarantee that suitable healthcare facilities and industrial safety/health strategies management are in place to protect their employees' lives at work, minimizing employee turnover and improving employee performance. Industrial workers should be provided opportunity to engage in frequent workshops, seminars, and lectures to enhance their understanding of safety precautions as part of the employer's social responsibility to them.

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